T-8311

T-8311

Name U.S. FISH & WILDLIFE SERVICE

By

Address 911 NE 11TH AVENUE
PORTLAND, OR 97232-4181
503-231-6251

Change in POU/USE

OTC Date filed 07/28/99

Date of hearing

Place of hearing

Date of order ..... Vol. ....., page .....

Date for application of water

Proof mailed

Proof received

Certificate issued ..... Vol. ....., page .....

DESCRIPTION OF WATER RIGHT

Name of stream Donner und Blitzen River

Trib. of Malheur Lake County of Harney

Use Irrigation/ Domestic/ Stock

Quantity of water ..... No. of acres .....

Name of ditch Carevari

Date of priority 1885

In name of W. J. Dunn

..... Adjudication, Vol. ....., page .....

App. No. ..... Per. No. D 15197 Cert. No. 15197

Certificate cancelled

Notation made on record by
In DP

12-20-99 ltw

FEES PAID

Date	Amount	Receipt No.
7-28-99	500.00	31547
11.19.99	100.00	34595
TOTAL . . .		
	Cert. Fee	

FEES REFUNDED

Date	Amount	Check No.

REMARKS

VoID/Robert W. Glaser CWRE#299

Oregon Water Resources Department
Water Right Services Division

In the Matter of Transfer Application T-8311, in the name of the United States Fish and Wildlife Service, Harney County	)))	ORDER ON RECONSIDERATION EXTENDING THE DATE FOR FULL BENEFICIAL USE OF WATER

The Oregon Water Resources Department (Department) on reconsideration of its Final Order on Transfer Application T-8311, dated January 23, 2019, extends the date by which full beneficial use of water must be made from October 1, 2019 to October 1, 2023.

FINDINGS OF FACT

1. The findings of fact in the Final Order on T-8311 issued on January 23, 2019, are incorporated herein without changes.

2. On January 23, 2019, a Final Order Approving Changes in Points of Diversion, Place of Use and Character of Use was issued on transfer application T-8311. The changes were approved subject to enumerated conditions. Condition #12 required that full beneficial use of water shall be made, consistent with the terms of the order, on or before October 1, 2019.

3. On March 22, 2019, the applicant, the United States Fish and Wildlife Service, submitted a petition for reconsideration requesting, among other things, that the date for full beneficial use of water be changed from October 1, 2019 to October 1, 2023, in order to allow sufficient time to comply with the conditions in the order.

4. The petition was submitted within the 60 day period established by OAR 137-003-0675(1).

5. The petition set forth specific grounds for the request for an extension of the final date by which full beneficial use of water must be made and was supported by written argument, complying with OAR 137-003-0675(3).

6. The petition included a certificate of service stating a copy of the petition was delivered or mailed to all parties, complying with OAR 137-003-0675(1).

7. On May 17, 2019, the Department notified the applicant that the Final Order would be reconsidered.

CONCLUSION OF LAW

1. The Department may reconsider the Final Order Approving Changes in Points of Diversion, Place of Use and Character of Use dated January 23, 2019.

ORDER

Full beneficial use of the water shall be made on or before October 1, 2023, consistent with the terms of this order, and the Final Order Approving Changes in Points of Diversion, Place of Use and Character of Use issued January 23, 2019, which is incorporated herein by reference with the same force and effect as though fully set forth herein.

Dated at Salem, Oregon on JUL 08 2019

Dwight French
Water Right Services Division Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

Appeal Rights

ORS 536.075(2) and ORS 183.482 allow for appeal of final orders in contested cases. This is a final order in a contested case. This order is subject to judicial review under ORS 183.482. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.482. Pursuant to ORS 536.075 and OAR 137-003-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

CERTIFICATE OF MAILING

I hereby certify that on July 9, 2019, I mailed a full, true and correct copy of the above ORDER ON RECONSIDERATION EXTENDING THE DATE FOR FULL BENEFICIAL USE OF WATER upon the parties hereto as follows by first class mail:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
Portland, OR 97232
Gary_Ball@fws.gov

Dwight and Susan Hammond
Hammond Ranches, Inc.
46911 Hammond Ranch Rd
Diamond, OR 97722

Frank S. Wilson
Office of the Regional Solicitor
601 SW 2nd Ave, Suite 1950
Portland, OR 97204
frank.wilson@sol.doi.gov

Laura Schroeder
Schroeder Law Offices PC
1915 NE Cesar E. Chavez Boulevard
Portland, OR 97212

Harney Soil & Water Conservation District
c/o Marty Goold
P.O. Box 848
Hines, Oregon 97738

Renee Moulun
Oregon Department of Justice NR
1162 Court St. NE
Salem, OR 97301-4096

Andy Dunbar
HCR 72 Box 200E
36076 Sodhouse Lane
Princeton, OR 97721

DATED this 8 day of July, 2019.

Patricia McCarty

Patricia McCarty, Agency Representative,
OREGON WATER RESOURCES DEPARTMENT

Mailing List for Order on Reconsideration Copies

Order Date:

Transfer Application T-8311

Copies Mailed

By: _____
(SUPPORT STAFF)

on: _____
(DATE)

Original mailed to applicant:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
Portland, OR 97232
Gary_Ball@fws.gov

Copies sent to:

1. WRD - App. File T-8311
2. WRD - Watermaster District: 10 – JR Johnson
3. WRD – Data

Receiving electronic copy of FO via e-mail (10 AM Tuesday of signature date)

East Region Manager – Jason Spriet Jason.D.Spriet@oregon.gov

CASEWORKER: PM

Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

May 17, 2019

Frank S. Wilson
U.S. Department of Interior
Office of Regional Solicitor – Pacific Northwest Region
601 SW 2nd Ave, Suite 1950
Portland, OR 97204

Re: Notice of Reconsideration of Final Order on Water Right Transfer Applications T-8309, T-8310 and T-8311

Dear Mr. Wilson,

Pursuant to OAR 137-004-0080(4) the Water Resources Department is reconsidering the Final Order on Transfer Applications T-8309, T-8310 and T-8311, issued January 23rd, 2019. The Final Order remains in effect during reconsideration. On conclusion of reconsideration the Department will issue an order confirming, modifying or reversing the existing orders.

Sincerely,

Dwight French,
Water Right Services Division Administrator

Frank S. Wilson
U.S. Department of the Interior
Office of the Regional Solicitor
Pacific Northwest Region
601 SW 2nd Ave., Suite 1950
Portland, OR 97204
(503) 231-2132
(503) 231-2166 (fax)
frank.wilson@sol.doi.gov

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Transfer Applications T-8309, T-8310, and T-8311	) NOTICE OF APPEARANCE)))))

The U.S. Fish and Wildlife Service hereby provides notice that Frank S. Wilson, attorney, appears as its representative in these proceedings, replacing Barbara Scott-Brier. Please direct future correspondence and filings in these matters to the undersigned at the address listed above. Also, note that the Office of the Regional Solicitor's address has changed as well.

Respectfully submitted this 22nd day of March, 2019.

Frank S. Wilson
Attorney for U.S. Fish and Wildlife Service

Certificate of Service

I hereby certify that on this 22nd day of March, 2019, a copy of the foregoing *Notice of Appearance*, *U.S. Fish and Wildlife Service's Request for Reconsideration*, and *Declaration of Tim Mayer (with exhibits)* were served to the following via Fedex:

Thomas M. Byler, Director
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

And to the following via U.S. Mail:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
Portland, OR 97232
Gary_Ball@fws.gov

Harney Soil & Water Conservation District
c/o Marty Goold
P.O. Box 848
Hines, OR 97738

Andy Dunbar
HCR 72 Box 200E
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Dwight and Susan Hammond
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Laura Schroeder
Schroeder Law Offices PC
1915 NE Cesar E. Chavez Boulevard
Portland, OR 97212

Renee Moulun
Oregon Department of Justice NR
1162 Court Street NE
Salem, OR 97301-4096

Dated this 22nd day of March, 2019.

Jeanne Bush

Jeanne Bush, Administrative Assistant
Office of the Regional Solicitor

Frank S. Wilson
U.S. Department of the Interior
Office of the Regional Solicitor
Pacific Northwest Region
601 SW 2nd Ave., Suite 1950
Portland, OR 97204
(503) 231-2132
(503) 231-2166 (fax)
frank.wilson@sol.doi.gov

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Transfer Applications T-8309, T-8310, and T-8311	) NOTICE OF APPEARANCE

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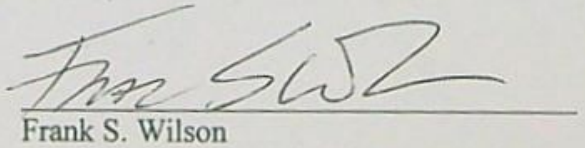

Frank S. Wilson
Attorney for U.S. Fish and Wildlife Service

Certificate of Service

I hereby certify that on this 22nd day of March, 2019, a copy of the foregoing *Notice of Appearance*, *U.S. Fish and Wildlife Service's Request for Reconsideration*, and *Declaration of Tim Mayer (with exhibits)* were served to the following via Fedex:

Thomas M. Byler, Director
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

And to the following via U.S. Mail:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
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Harney Soil & Water Conservation District
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Schroeder Law Offices PC
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Portland, OR 97212

Renee Moulun
Oregon Department of Justice NR
1162 Court Street NE
Salem, OR 97301-4096

Dated this 22nd day of March, 2019.

Jeanne Bush

Jeanne Bush, Administrative Assistant
Office of the Regional Solicitor

Frank S. Wilson
U.S. Department of the Interior
Office of the Regional Solicitor
Pacific Northwest Region
601 SW 2nd Ave., Suite 1950
Portland, OR 97204
(503) 231-2132
(503) 231-2166 (fax)
frank.wilson@sol.doi.gov

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Transfer Applications T-8309, T-8310, and T-8311	) U.S. FISH AND WILDLIFE) SERVICE'S REQUEST FOR) RECONSIDERATION))

The U.S. Fish and Wildlife Service (USFWS) hereby requests reconsideration of the Oregon Water Resource Department's (OWRD's) *Final Order Approving Changes in Points of Diversion, Place of Use and Character of Use* regarding Transfer Applications T-8309, T-8310, and T-8311 (collectively, *Final Orders*) (three separate *Final Orders* were issued, each with the same document title). As described in greater detail below, the USFWS requests reconsideration of the monitoring requirements included in each of the *Final Orders*. The USFWS believes that monitoring all the points of diversion (PODs) as required in the Final Orders, in addition to the existing monitoring already being done at the Refuge, is overly burdensome, is an economic hardship, and is unnecessary because of the limited possibility of injury to existing water rights. As shown below, a modified monitoring program is appropriate and will meet the monitoring requirements under Oregon state law. The USFWS therefore requests that the *Final Orders* be amended to incorporate the monitoring requirements in the USFWS' existing monitoring plan, as updated and amended to reflect the transfers approved in the *Final Orders*.

I. Legal and Factual Background.

Under OAR 690-085-0010, governmental entities are required to report annually regarding their water use and those reports should include:

> (a) The name and address of the reporting entity;
> (b) The monthly volume of water diverted or pumped from natural flow and/or stored water for each major category of use at each point of diversion listed on the water rights, except as noted in subsections (2)(c), (d), and (e) of this rule. The volume of water diverted or pumped shall be determined as prescribed in OAR 690-085-0015;
> (c) For in-reservoir uses, the volume of water impounded on approximately the same day each month;
> (d) For instream water rights, the monthly volume of water flowing through the channel for at least one point covered by the water right;
> (e) For instream uses supplied from storage, the volume of stored water released every month.

OAR 690-085-0010(2).

The Director, however, may waive the reporting requirements if a government entity shows that:

> (a) Complying with the rule(s) would cause an economic hardship on the governmental entity; and
> (b) The information to be collected would not materially aid water management because:
> (A) The regulation for or of the use is unlikely due to the absence of other water rights; or
> (B) Use of water is unlikely to materially affect water availability from the source since the quantity of water allowed by the right in relation to the quantity of water available from the source is deminimis; or
> (C) Another similar situation exists.

OAR 690-085-0010(6).

The USFWS holds a large number of state appropriative water rights at Malheur National Wildlife Refuge (Refuge), including four rights for Blitzen Valley lands sourced from the Blitzen River and tributaries, a water right permit for six springs in the Double O area of the Refuge, sixty-three "Ponds Bill" water right certificates for ponds in the Blitzen Valley and Double O, two water right certificates for storage and use of Sodhouse Springs, two water right certificates

for use of Silver Creek, seven water right certificates for storage and use of Krumbo reservoir, and sixteen water right certificates for lands in and around Malheur Lake sourced from the Blitzen River. *Declaration of Tim Mayer* (*Mayer Decl.*) ¶ 2. Some of these rights have multiple points of diversion. *Id.* ¶ 3. Given the numerous water rights and points of diversion, the complexity of the water distribution system within the Refuge, and the challenges of monitoring in low-gradient conditions characteristic of the Refuge, OWRD and the USFWS recognized that it is not feasible or possible to monitor all points of diversion for every water right. In 1996, the USFWS developed and proposed a simplified water monitoring and water use reporting strategy for the Refuge. The plan outlines an alternative water budget approach for measuring water use at the Refuge and was approved by OWRD on November 4, 1996. *Id.* ¶ 3, Exhibit A (Water Measuring Plan). It mirrors the water budget approach used by the Oregon State Engineer in the Donner und Blitzen Adjudication in 1931.

The Water Measuring Plan includes a robust suite of actions to monitor water flow into and water use within the Refuges. In accordance with the Plan, the USFWS maintains five continuous streamflow gages with dataloggers to measure the major inflows to the Refuge, along with three other gages to ensure minimum flows are being met within the Refuge. In addition, USFWS collects periodic streamflow measurements at several locations within the Refuge to help improve estimates of minor inflows to the Refuge. They have mapped bathymetry and developed storage capacities for Krumbo reservoir and nearly twenty individual wetlands/ponds on the Refuge, all of which are monitored monthly to track water in storage. They are in the process of developing flow monitoring sites on springs at the Double O, in compliance with the new water right permit for those springs. *Mayer Decl.* ¶ 5.

In addition to water quantity, the Refuge also monitors water quality parameters. Permit 54164, a new water right permit for winter use of the Blitzen River, required the USFWS to develop and submit a Water Quality Monitoring Plan to OWRD. In 2002, USFWS funded and conducted a $300,000, two-year study of hydrology and water quality on the Blitzen Valley portion of the Refuge. The 131-page report presenting the study results was used to determine monitoring needs for the Water Quality Management Plan required by Permit 54164. *Mayer Decl.* ¶ 6, Exhibit D. The study identified water temperature and dissolved oxygen as the two most critical water quality concerns in the river and also demonstrated the link between river flows and water temperatures. The USFWS has been actively restoring stream channel and riparian conditions in the Blitzen River and manages surface water flows to maintain a balance between diversions for migratory bird habitat and instream flows for fish and other aquatic species. The USFWS also maintains a water temperature monitoring network in the Blitzen River and its tributaries. The Water Quality Management Plan was submitted to OWRD in October 2015. *Mayer Decl.* ¶ 7, Exhibit E.

Finally, the USFWS has funded and continues to fund, at a current cost of approximately $27,000/year, a USGS streamflow gage on the Donner und Blitzen River near Frenchglen. This is a long-term streamflow gage that measures streamflow and temperature in the Blitzen River upstream of the Refuge. There is no regulation and only minimal diversions upstream of this site, and continuous data has been collected at this site since 1939, making it a very valuable, long-term reference streamflow gage. The data from this site is used by USFWS in the computation and reporting of total inflow to the Blitzen Valley portion of the Refuge, as described in the Water Measuring Plan. Data from the gage also helps assess background water temperatures in the Blitzen River before it enters the Blitzen Valley. *Mayer Decl.* ¶ 8.

II. The reporting requirements in the *Final Orders* would cause economic hardship.

As demonstrated above and in the Water Measuring Plan, the USFWS has spent considerable time, money, and effort studying and monitoring hydrology and water quality at the Refuge. The USFWS is very concerned about the health of the aquatic ecosystem in this area and also wants to respect neighboring water rights. Currently, USFWS estimates that it dedicates about half a full-time employee (FTE) to monitoring flows, water levels, and water temperature at the Refuge and reporting Refuge water use to OWRD, resulting in an annual cost of about $50,000. In addition, they are funding the USGS gage at the Refuge for an additional $27,000 annually. This means the current monitoring and reporting effort for the Refuge costs the USFWS over $75,000 a year. *Mayer Decl.* ¶ 9.

Monitoring each point of diversion (POD), as required in the proposed Final Orders, would, at a minimum, double the number of monitoring sites that the USFWS maintains at the Refuge. This would add considerably to this total cost of monitoring and would be an extreme hardship in terms of financial costs and demand for additional resources. The USFWS estimates that monitoring all PODs would require an additional FTE with an additional cost in labor and equipment of several hundred thousand dollars. Furthermore, there are numerous challenges with attempting to monitor in this low-gradient system, as described in the Water Measuring Plan. It is questionable whether it is even feasible to monitor each of these points of diversion. *Mayer Decl.* ¶ 10.

III. The reporting requirements in the *Final Orders* would not materially aid in water management.

OWRD has repeatedly recognized the challenge of monitoring each diversion on the Refuge and accepted an alternative water budget approach on at least three occasions in the past: in 1931, when the Oregon State Engineer employed such an approach as part of the Donner und

Blitzen Adjudication; in 1996, when it approved the USFWS's Water Measuring Plan which uses the same approach; and in 2005, when it issued the Final Order for the USFWS's Application S-84222 (Permit 54164). The monitoring and reporting requirements in the 2005 Final Order for Application S-84222 referred to the Water Measuring Plan and required the USFWS to follow that plan for monitoring and reporting rather than all PODs within the permit. *Mayer Decl.* Exhibit C, at PDF page 61 (page 13 of the draft permit attached to the Order).

Oregon law provides that a proposed transfer or change application shall be approved if "it can be effected without injury to existing water rights." ORS 540.530. The major concern with any water right change is injury to other water rights and the purpose of water right monitoring is, in part, to protect against this. Furthermore, the PODs identified in the Final Orders are all within the Blitzen Valley area of the Refuge. This area is located at the downstream end of the Blitzen River system and there are only two other private water rights that exist north or downstream of this area: Certificates 15203 and 15231. The point of diversion for both of these rights is on Refuge land and the USFWS works cooperatively with these landowners to manage diversions for these rights. There has been no injury to these rights in the past and the USFWS does not anticipate any future injury. *Mayer Decl.* ¶ 12. Monitoring every POD on the Refuge to ensure that these two water rights are protected is not necessary to manage water rights in the area.

IV. USFWS' proposed amendment to the *Final Orders'* reporting requirements would meet the purposes of the Oregon reporting requirements.

The Water Measuring Plan has not been updated or revised since it was submitted and approved in 1996. As discussed above, water monitoring at the Refuge has proved to be very challenging and the USFWS has learned much in the decades since the plan was written. The USFWS has developed an amended Water Measuring Plan, which incorporates adjusted methods

and incorporates changes to USFWS-held water rights since the original plan was developed. The approaches and details of some of the water monitoring have changed, but the basic approach is the same. The proposed amended plan is submitted with this *Request for Reconsideration* for approval by OWRD. *Mayer Decl.* Exhibit B.

The USFWS proposes minor amendments to the *Final Orders* that would require a reasonable reporting process to provide OWRD sufficient and appropriate information to manage water in the basin. Specifically, the USFWS proposes to replace conditions 4 through 6 in each of the three *Final Orders* with the condition found in the Permit 54164, as amended to reflect the updated plan:

> The permittee shall implement the provisions concerning measurement and reporting of flows contained in a measurement and reporting plan developed by the permittee and approved by the Oregon Water Resources Department. The current plan is titled "Water Measuring Plan for Malheur National Wildlife Refuge in Compliance with ORS 537.099: Water Use Reporting for Government Entities," September 1996 (updated March 2019), which is hereby approved. Any future amendment of the plan must be submitted to OWRD for approval.

As part of this *Request for Reconsideration*, USFWS asks that OWRD review and approve the proposed amended Water Measuring Plan. As an alternative, if OWRD would like to separate approval of the plan from this *Request for Reconsideration*, USFWS proposes an alternative condition to replace conditions 4 through 6:

> The permittee shall implement the provisions concerning measurement and reporting of flows contained in a measurement and reporting plan developed by the permittee and approved by the Oregon Water Resources Department. This plan is titled "Water Measuring Plan for Malheur National Wildlife Refuge in Compliance with ORS 537.099: Water Use Reporting for Government Entities," September 1996. The plan was approved by the Water Resources Department in a letter dated November 4, 1996. Any amendment of the plan must be submitted to OWRD for approval and following OWRD approval permittee shall implement the provisions of the amended plan.

Under this alternative, USFWS would continue to implement the existing Water Measuring Plan, as they currently do,[1] until OWRD has reviewed and approved the proposed updated plan.

V. Conclusion

For the reasons discussed above, the USFWS respectfully requests that OWRD replace conditions 4 through 6 in each of the *Final Orders* with a single condition requiring implementation of the approved Water Measuring Plan.

Respectfully submitted this 22nd day of March 2019.

Frank S. Wilson
Attorney for U.S. Fish and Wildlife Service

[1] Some of the measures in the 1996 Water Management Plan have proved ineffective and the USFWS, with OWRD's concurrence, has made some slight adjustments to achieve the goals of the Plan. The USFWS would continue to implement the Plan with those minor adjustments until the amended Plan is approved by OWRD.

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Transfer Applications T-8309, T-8310, and T-8311	)	DECLARATION OF TIM MAYER

I, Tim Mayer, declare as follows:

1. I am the Supervisory Hydrologist of the Water Resources Branch of the U.S. Fish and Wildlife Service (USFWS) in the Regional Office in Portland, Oregon. I have been employed as a hydrologist by the USFWS in the branch for the past 24 years. The mission of the branch is to protect the water rights and water resources of the USFWS in Regions 1 and 8. The branch includes nine employees and we work with 150 national wildlife refuges and national fish hatcheries in six states. As the supervisor, I provide direction and guidance to the staff, including those responsible for water monitoring and water rights at Malheur National Wildlife Refuge (Refuge). In the past, I have been personally involved with studies and water monitoring at the Refuge as well.

2. The USFWS holds a large number of state appropriative water rights at the Refuge, including four rights for Blitzen Valley lands sourced from the Blitzen River and tributaries, a water right permit for six springs in the Double O area of the Refuge, sixty-three "Ponds Bill" water right certificates for ponds in the Blitzen Valley and Double O, two water right certificates for storage and use of Sodhouse Springs, two water right certificates for use of Silver Creek, seven water right certificates for storage and use of Krumbo reservoir, and sixteen water right certificates for lands in and around Malheur Lake sourced from the Blitzen River.

3. Some of these rights have multiple points of diversion. Given the numerous water rights and points of diversion, the complexity of the water distribution system within the Refuge, and the challenges of monitoring in low-gradient conditions characteristic of the Refuge, the Oregon Water Resources Department (OWRD) and the USFWS recognized that it is not feasible or possible to monitor all points of diversion for every water right. In 1996, the USFWS developed and proposed a simplified water monitoring and water use reporting strategy for the Refuge. The plan, entitled "Water Measuring Plan for Malheur National Wildlife Refuge in Compliance with ORS 537.099: Water Use Reporting for Government Entities" (Water Measurement Plan) outlines an alternative water budget approach for measuring water use at the Refuge. A copy of the Water Management Plan is attached as Exhibit A. It was approved by OWRD on November 4, 1996.

4. The Water Measurement Plan has not been updated or revised since it was submitted and approved in 1996. Water monitoring at the Refuge has proved to be very challenging and the USFWS has learned much in the 20+ years since the plan was written. The approaches and details of some of the water monitoring have changed, but the basic approach is the same. The plan has been recently updated to reflect current information, including all of the water rights mentioned above, and the updated version is attached to this declaration as Exhibit B.

5. In accordance with the plan, the USFWS maintains five continuous streamflow gages with dataloggers to measure major inflows to the Refuge. We also maintain three other streamflow gages with staff gages to ensure minimum flows are being met within the Refuge, as conditioned in Permit 54164. We have developed and continue to maintain rating curves for all of these sites. In addition, we have collected and continue to collect periodic streamflow measurements at several locations (springs, ditches and canals, seepage runs to investigate

gains/losses) within the Refuge to help improve estimates of minor inflows to the Refuge. We have mapped bathymetry and developed storage capacities for Krumbo reservoir and nearly 20 individual wetlands/ponds on the Refuge, all of which are monitored monthly to track water in storage. We are in the process of developing flow monitoring sites on springs in the Double O area, in compliance with the new water right permit for those springs.

6. Permit 54164, a new water right for winter use of the Blitzen River, required the USFWS to develop and submit a Water Quality Monitoring Plan to OWRD. A copy of the OWRD Order issuing Permit 54164 is attached as Exhibit C. In 2002, we funded and conducted a $300,000, two-year study of hydrology and water quality on the Blitzen Valley portion of the Refuge. The purpose of the study was to assess the impacts to water quantity and water quality associated with Refuge water and habitat management in this area. We investigated water inflows, outflows, and consumptive use and examined impacts from management practices on water temperature, field water quality parameters, and nutrients. The results from this study are presented in a 131-page report entitled "Hydrology and Water Quality at Malheur National Wildlife Refuge." A copy of that report is attached to this declaration as Exhibit D. The study results were used to determine monitoring needs for the Water Quality Management Plan required by Permit 54164.

7. The study identified water temperature and dissolved oxygen as the two most critical water quality concerns in the river and also demonstrated the link between river flows and water temperatures, although it is difficult to assess pre-development conditions in this unique system. The study concluded that both of these parameters can be addressed through management of summer baseflows and diversions and the restoration of riparian vegetation along the channel. The USFWS has been actively restoring stream channel and riparian conditions in the Blitzen

River and manages surface water flows to maintain a balance between diversions for migratory bird habitat and instream flows for fish and other aquatic species. The USFWS also maintains a water temperature monitoring network in the Blitzen River and its tributaries. The Water Quality Management Plan was developed by USFWS and submitted to OWRD in October 2015. A copy of the plan and the submission letter is attached as Exhibit E.

8. Finally, the USFWS has funded and continues to fund, at a current cost of approximately $27,000/year, the United States Geological Survey (USGS) streamflow gage (USGS Site No 10396000 Donner Und Blitzen River Near Frenchglen, OR) for continuous monitoring of streamflow and water temperature. This is a long-term streamflow gage that measures streamflow in the Blitzen River upstream of the Refuge. There is no regulation and only minimal diversions upstream of this site, and continuous data has been collected at this site since 1939, making it a very valuable, long-term reference streamflow gage. The data from this site is used by USFWS in the computation and reporting of total inflow to the Blitzen Valley portion of the Refuge, as described in the Water Measurement Plan (Exhibit B). Data from the gage also helps assess background water temperatures in the Blitzen River before it enters the Blitzen Valley and the Refuge.

9. I estimate that USFWS dedicates about half a full-time employee (FTE) to monitoring flows, water levels, and water temperature at the Refuge and reporting Refuge water use to ORWD, resulting in an annual cost of about $50,000. In addition, we are funding the USGS gage at the Refuge for an additional $27,000 annually. This means the current monitoring and reporting effort for the Refuge costs the USFWS over $75,000 a year.

10. Monitoring each point of diversion (POD), as required in the proposed Final Orders, would, at a minimum, double the number of monitoring sites that the USFWS maintains at the

Refuge. This would add considerably to this total cost of monitoring and would be an extreme hardship in terms of financial costs and demand for additional resources. I estimate that monitoring all PODs would require an additional FTE with an additional cost in labor and equipment of several hundred thousand dollars. Furthermore, there are numerous challenges with attempting to monitor in this low-gradient system, as described in the Water Measurement Plan. It is questionable whether it is even feasible to monitor each of these PODs.

11. OWRD has repeatedly recognized the challenge of monitoring each diversion on the Refuge and accepted an alternative water budget approach on at least three occasions in the past: in 1931, when the Oregon State Engineer employed such an approach as part of the Donner und Blitzen Adjudication, as described in the Water Measurement Plan; in 1996, when it approved the USFWS's Water Measurement Plan which uses the same approach; and in 2005, when it issued the Final Order for the USFWS's Application S-84222 (Permit 54164) (Exhibit C).

12. The PODs identified in the *Final Orders* are all within the Blitzen Valley area of the Refuge. This area is located at the downstream end of the Blitzen River system and there are only two other private water rights that exist north or downstream of this area: Certificates 15203 and 15231. The point of diversion for both of these rights is on Refuge land and the USFWS works cooperatively with these landowners to manage diversions for these rights. There has been no injury to these rights in the past and the USFWS does not anticipate any future injury.

I hereby affirm under penalty of perjury that the statement above is correct.

Dated this 21st day of March, 2019.

Tim Mayer

Exhibit A

WATER MEASURING PLAN FOR MALHEUR NATIONAL WILDLIFE REFUGE IN COMPLIANCE WITH ORS 537.099: WATER USE REPORTING FOR GOVERNMENT ENTITIES

DIVISION OF ENGINEERING
REGION ONE
FISH AND WILDLIFE SERVICE
SEPTEMBER 1996

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Water Measuring Plan for Malheur NWR In Compliance with ORS 537.099: Water Use Reporting for Government Entities

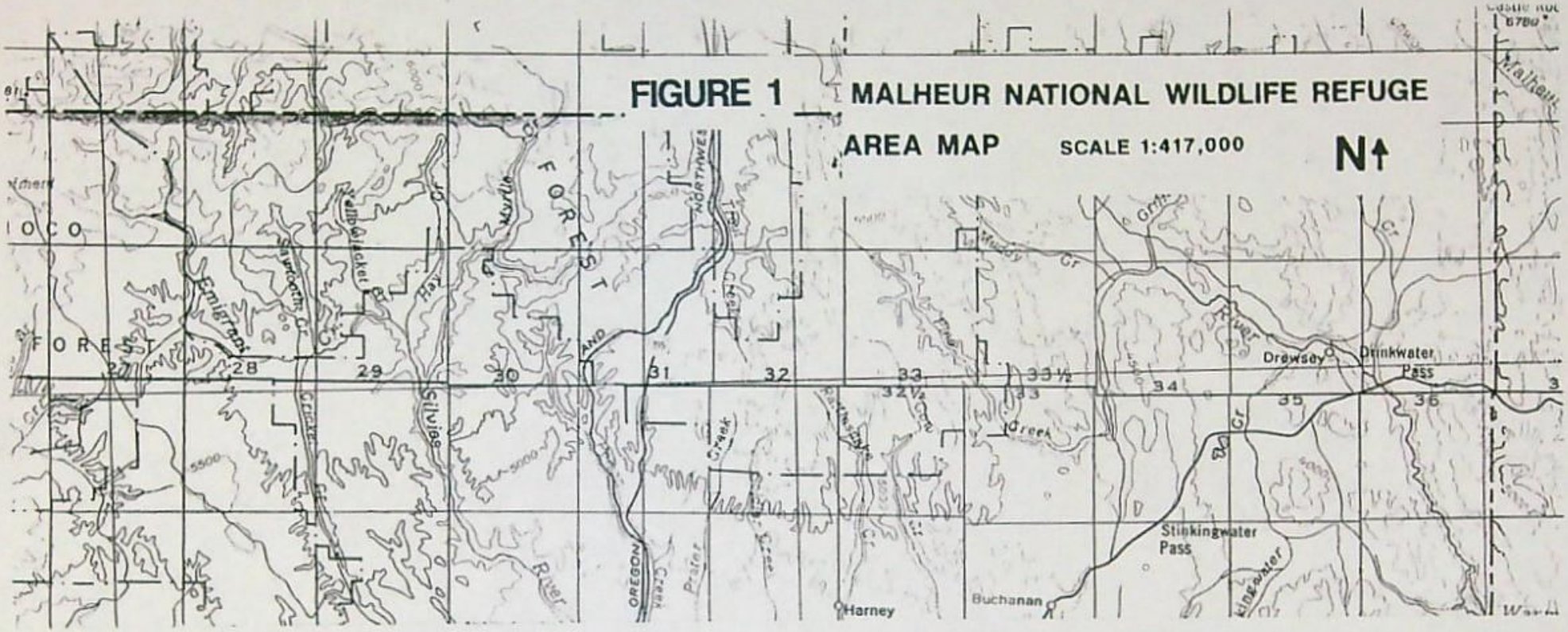
Introduction

Oregon Revised Statutes (ORS) 537.099 requires government agencies holding water rights in Oregon to report annual water use. Chapter 690 Division 85 of the Oregon Administrative Rules sets forth regulations specifying when and how the reporting is to be done. Reports must provide information for each water right held including the quantity of water used each month of the year, the source of water, point of diversion (POD), and the methods employed to measure water use. Reports for the water year (ending September 30) must be submitted to the Oregon Department of Water Resources (OWRD) by the end of each calendar year. The purpose of water use reporting is to insure compliance with water quantity and use(s) specified in the state-issued water right certificate.

The U.S. Fish and Wildlife Service (Service) holds many water rights on National Wildlife Refuges in Oregon, and is expected by the state to comply with its requirements. As a matter of comity without agreeing to the State's authority to administer the Service's water rights, the objective of this report is to propose a simplified water use reporting strategy for Malheur National Wildlife Refuge (Refuge) that is acceptable to OWRD.

Acceptable methods to determine water used by a particular water right are outlined in Division 85. These methods are the same as those used by the U.S. Geological Survey (USGS) for hydrologic studies, and are the standard in substantiating water rights claims in adjudications and other legal proceedings.

Since water use reporting began in water year 1992, the Refuge staff has provided estimates of water use for the requested water rights and these estimates have been reported to OWRD. With the assistance of the Regional Office, the Refuge staff has installed recording equipment and is developing rating curves at a number of locations on the Refuge. This is the first step in an attempt to comply with the accuracy standards required in the Division 85 rules. The data collected from these sites will be utilized in future water use reports. Because of the complexity of the hydrology and the multitude of water rights and diversions involved, the Refuge requested assistance from the Regional Office to develop a simplified yet comprehensive water use measuring and reporting strategy. The resulting strategy described in this report is designed to satisfy OWRD requirements and still be feasible for the Refuge in terms of cost and staff time.



Background

Malheur NWR is located in Southeast Oregon approximately 270 miles southeast of Portland, Oregon. Malheur is one of the largest wildlife refuges in Region 1 (Figure 1). It encompasses 185,000 acres of lands in the Donner und Blitzen River and Silver Creek watersheds, including Malheur and Harney Lakes. The elevation is approximately 4100 ft. at Refuge headquarters. The climate is arid, with the mean annual precipitation approximately 11 in/yr. The hydrology of the Refuge consists of a complex system of dikes, diversions, irrigated land, natural and enhanced wetlands, and lake habitat. Refuge water sources include inflows from springs, streams, ground water, and overland flow.

The Refuge holds numerous water rights that allow water to be used for Refuge objectives. Individual measurement of each water right at the point of diversion (as Division 85 requires) would be impractical due to the complexity of the system. This report proposes the best alternatives. The methods proposed for the Donner und Blitzen Valley are very similar to those used in the 1931 State Engineer's report on water use (McAllister, 1931).

Donner und Blitzen River and Tributaries Above Sodhouse Dam
Water Rights: Certificates 28524, 15217, 14367

The Refuge diverts water from the Donner und Blitzen River to be used for irrigation in the Blitzen Valley. Water use for this area is allowed by the above-listed water rights. Certificate 28524 allows the maximum diversion rate of 0.025 cfs per acre from March 15 to June 15 and 0.0125 cfs per acre from June 15 to October 15. This water right covers approximately 40,000 acres of land. Certificates 15217 and 14367 use water from McCoy Creek and Bridge Creek, respectively. The place of use for these water rights is adjacent to lands covered under Certificate 28524, and water is supplied through the same ditch works. Therefore, the methods described below will estimate water use for Certificates 28524, 15217, and 14367.

"Ponds Bill" Certificates
69460, 70409, 70410, 70411, 70412, 70413, 70415, 70416, 70417, 70418, 70422, 70423, 70425, 70430, 70431, 70432, 70433, 70434, 70436, 70437, 70438, 70439, 70442, 70443, 70444, 70445, 70446, 70447, 70448, 70449, 70450, 70451, 70458, 70459, 70461, 70462, 70463, 70464, 70465, 70466, 70467, 70468, 70469, 70470, 70471, 70472, 70473, 70474.

In 1994 the Service submitted "Ponds Bill" applications for 50 ponds which receive water out of the Donner und Blitzen River and tributaries above Sodhouse Dam. The above listed certificate numbers were issued for 48 of these ponds. The 2 certificates not listed above are covered under the section on Krumbo Creek and Krumbo Reservoir. The combined pond storage capacity is 9,297 acre-feet. Prior to the irrigation season, water diverted out of the Donner und Blitzen River is used to fill ponds. In general, the same diversion works and delivery systems used to divert and apply irrigation water are used to supply water to the ponds.

Stream flow in the Blitzen River is primarily supplied by snow melt on Steens Mountain. Numerous springs contribute to the flow and maintain the base flow after the spring run off. The Blitzen River crosses the southern Refuge boundary approximately 600 ft upstream of Page Springs dam. The Blitzen River flows north approximately 43 miles through the Blitzen Valley, then empties into Malheur Lake. There are no hydrologic outlets to Malheur Lake. The elevation drop from the southern Refuge boundary to Malheur Lake is about 130 ft, thus the approximate mean slope of the Blitzen River on Refuge lands is 0.0006 . Significant tributaries to the Blitzen River within this stream reach include Mud Creek, Bridge Creek, Krumbo Creek, and the Diamond Canal system.

Historically, seasonal inundation of the Blitzen Valley (caused by the low slope of the river channel) created large areas of natural wetland habitat. During the period of settlement of the Blitzen Valley, approximately 18 miles of the Blitzen River were channelized, and much of the wetland areas were drained to provide lands for agriculture. Many of the structures, canals, and dikes that exists in the Blitzen Valley today were installed during this period. Since the lands in the Blitzen Valley were aquired by the U.S. Government, efforts have been made by the Refuge to restore the original wetland habitat.

Division 85 of the Oregon Administration Rules states that water use is to be measured at or near each point of diversion by means of a rated channel, a flume, or a weir. Measurement of the diversion rate must be made at least once every three days, and accuracy is to be within 15% of the true value. This is impractical in the case of the Blitzen Valley due to the large number of diversions (there are at least 20 along the Blitzen), and the small number of Refuge employees available to conduct the measuring. Furthermore, the small elevation gradient causes the system to be continuous in a hydrologic sense; and conducting velocity, flume and weir measurements at discrete points in the system are difficult due to back water effects. It is therefore problematic to measure water use for the above-mentioned water rights as outlined in Division 85, and alternative methods are proposed.

Methods of Measurement

An alternative method of measuring water use is to develop a simplified water budget for the Blitzen Valley system. This was the approach taken by the State Engineer in assessing the Valley's water supply prior to the Donner und Blitzen River Adjudication (McAllister, 1931).

A commonly used relation that describes a water budget for a hydrologic system is:

$$I - O = \Delta S/\Delta t \qquad \textbf{(eq. 1)}$$

where I is the total inputs, O is the total outputs, and $\Delta S/\Delta t$ is the change in storage with respect to time.

To account for numerous inputs and outputs, eq. 1 can be expressed as:

$$(I_1 + I_2 + \ldots + I_n) - (O_1 + O_2 + \ldots + O_n) = \Delta S/\Delta t \qquad \textbf{(eq. 2)}$$

Typical input components are surface and ground water inflow from outside the system, and precipitation over the system. Outputs include water leaving the system as surface water, seepage, and evaportranspiration (ET). For the purposes of compliance with Division 85 rules, this analysis is concerned with the quantity of water that is used from the Donner und Blitzen River. There are two components of Refuge water use under these water rights: irrigation and pond storage. Eq. 2 as written would only provide the pond storage component. We are interested in total water use which includes the ET of water applied for irrigation. On page 6 of this report, eq. 2 is rewritten with the term U_R which represents total water use and includes both pond storage and ET of water diverted for irrigation.

To estimate water use by the Refuge, eq 2 can be used with the following components:

Inflows:

1. Donner und Blitzen River (including East and West Canal systems)
2. Mud Creek
3. Bridge Creek
4. Krumbo Creek
5. Diamond Canal System (Inflows from McCoy, Kiger, Cucamunga, and Swamp Creeks)
6. Flows originating from springs downstream of measuring points

Outflow:

1. Mainstem of Donner un Blitzen river below Sodhouse dam
2. Canals that convey water off Refuge property

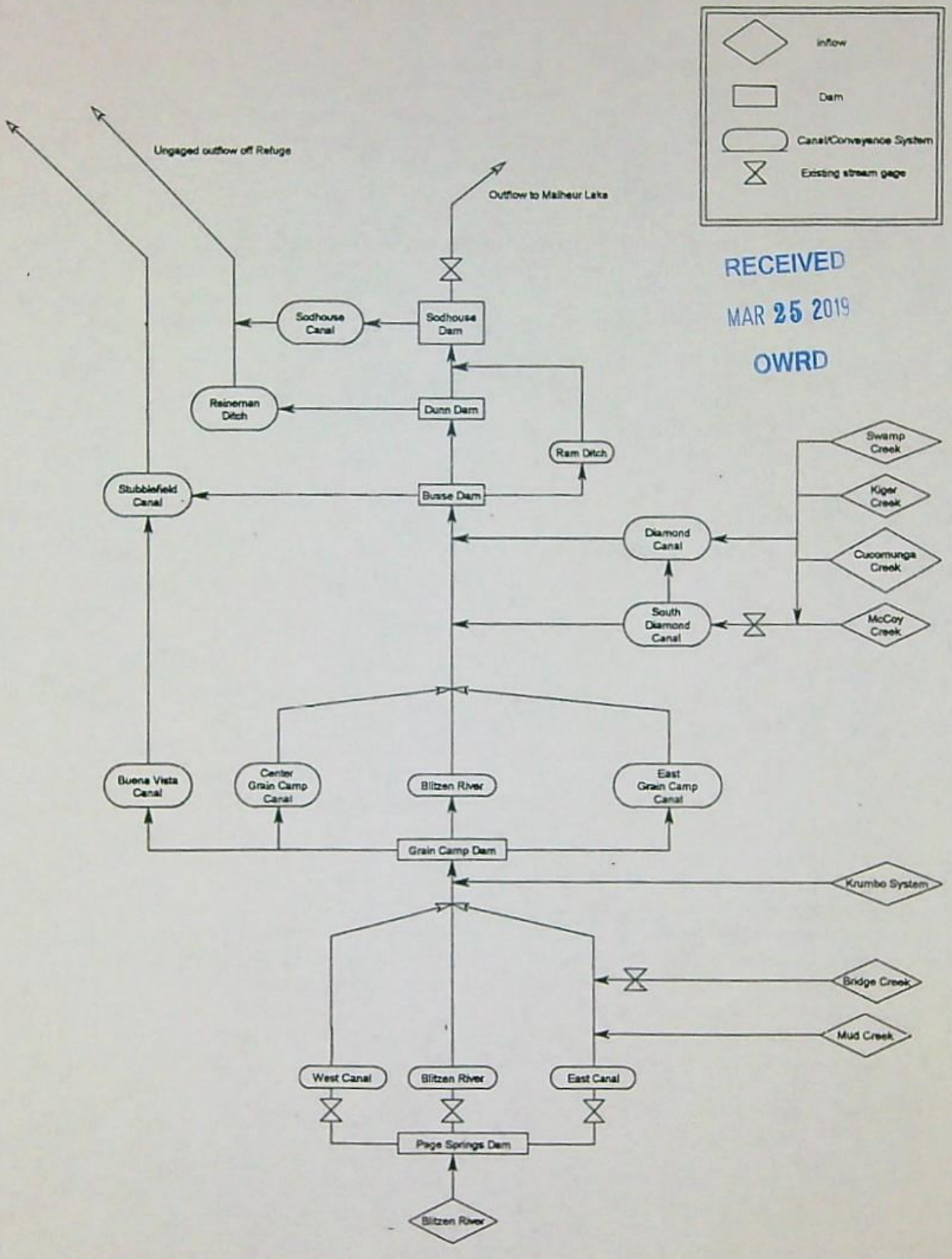
Assumptions:

1. Net ground water seepage into or out of the system is negligible.
2. Local runoff downstream of the measuring sites is negligible. Given the mean annual precipitation of 11 in/yr and the low topographic relief of the Blitzen Valley, local runoff will be insignificant when compared to inflows from major streams.

Figure 2 is a schematic representation of the Blitzen Valley system showing the above-listed inflows and outflows. Presently, there are five sites where continuous water level recorders have been installed to measure inflows. These stations are equipped with Stevens A/F data loggers which are capable of recording stage data at user-specified time intervals. Development of rating curves is necessary to determine the stage/discharge relation for each station. With the exception of Diamond Canal system, preliminary rating curves have been developed. Data collection is continuing and the ratings are being refined. Once ratings have been completed, periodic measurements at the gaging stations will be necessary to insure accuracy.

FIGURE 2

Schematic diagram of the Blitzen Valley showing major structures, diversions, and stream gaging stations.



Inflows to the Refuge originating in the Diamond Valley are difficult to measure. There are two points of inflow onto the Refuge in this area: the Diamond Canal to the north and the South Diamond Canal. Combined flows from Swamp Creek, Kiger Creek, and Cucamunga Creek are collected in the Diamond Canal. A portion of flow from the Diamond Canal joins McCoy Creek to form the South Diamond Canal. Due to the low elevation gradients of these streams and canals, it is difficult to consider them as hydrologically distinct. Flow in the canals vary seasonally with respect to upstream water use. At present, there is a data logger installed on the South Diamond Canal within the Refuge boundary. However, no rating has been developed at this site, and it is not likely that one can be.

The major obstacle to providing flow data results from the low elevation gradient between the Refuge boundary and the Blitzen River. A significant rise in the water surface elevation in the Blitzen causes water to back up into the Diamond Valley, making it impossible to develop a stage/discharge correlation. Alternative means of measuring/estimating flow in this area are currently being investigated and the best practical means will be utilized.

There are other ungaged surface water inflows, including Mud Creek, Krumbo Creek, and numerous springs. Flows from Mud Creek will be estimated on an interim basis using Bridge Creek data and a similar basins analysis (see appendix). As described in the appendix, the available base flow data for Mud Creek does not match the estimate from the similar basins analysis. The Service plans to collected paired disharge measurements over a 12 month period and use these data to improve the accuracy of the Mud Creek estimate.

Krumbo Creek is a tributary of the Donner und Blitzen River, however the contribution of flow from this source is regulated by Krumbo dam. According to the Refuge staff, water from Krumbo Reservoir is discharged into the downstream channel approximately two to three months each year. All water released is used for supplemental irrigation on lands adjacent to Krumbo Creek, or in the two "Ponds Bill" ponds in the Krumbo Creek drainage and will be reported under the associated water rights. Little, if any, Krumbo Creek water reaches the mainstem Blitzen River and can thus be neglected as an input to the Blitzen Valley water budget.

There are numerous springs that exist within the Refuge boundaries that contribute to the total flow. Direct discharge measurements of each spring would be difficult due to backwater effects of adjacent canals. Estimates of flow rates as provided by Refuge staff are given in Table 1. The total of these estimates will be added to the total inflow. An attempt will be made to refine these estimates with actual measurements wherever possible.

Table 1
Estimated flow of Ungaged Springs

	Flow (cfs)
Five Mile Springs	2
Oliver Springs	2
Mud Creek Springs	1
Hogwallow Springs	2
Webb Creek Springs	1
Barn Springs	2
Knox Spring	2
Total	12

The output component of eq. 2 is represented by the gaged outflow of the Blitzen River below Sodhouse dam, and estimates of ungaged outflows. The existing stream gaging station was built and operated by the USGS until the 1979 flood. Since then, the Service has installed a Stevens data logger at the site, and is in the process of developing a rating for the channel. During low flow conditions, all surface water leaving the Blitzen Valley system passes this site. This will be the only continuously gaged outflow from the Blitzen Valley in the water budget.

During the snow melt period, a small proportion of the total flow is allowed to leave Refuge lands via the Rieneman and Sodhouse ditch systems, and at the diversion to the Dunn in-holding. Given the intermittent nature of these flows, the installation of permanent water measuring devices is not recommended. Instead, spot measurements or visual observations are sufficent to estimate the additional outflow. Although this may lead to error in the outflow component of the water budget, it is important to remember this analysis is concerned with measuring water use, i.e. the difference between inflow and outflow. Since ungaged volumes that leave the Refuge are very small compared to the total inflow, error in reported water use resulting from error of estimates of ungaged outflow will be small.

Discharge data from each gaging station are initially expressed as flow rates. For the purposes of the water budget, flow rates will be expressed as monthly volumes. As described above, the term $\Delta S/\Delta t$ in eq. 2 can be replaced with the term U_R which includes ET. Equation 2 has been rewritten to represent monthly water use volume by the Refuge.

$$U_R = [\sum I + I_M + I_S] - [O_1 + O_2] \qquad \textbf{(eq. 3)}$$

Where U_R is net monthly water use volume, $\sum I$ is the sum of all gaged monthly inflow volumes, I_M is the estimated monthly inflow volume from Mud Creek, I_S is the estimated monthly volume of water from springs (assumed to be constant), O_1 is the gaged monthly outflow volume near Sodhouse dam, and O_2 is estimated monthly volumes that flow off Refuge property (via the Reineman and Sodhouse ditches, and water used to irrigate lands on the Dunn properties in Section 15, Township 27S, Range 31E).

The term U_R includes return flow (water returned to the Blitzen after use) and is therefore *net* water use (this is referred to as "depletion" in the 1931 State Engineer's report), not the gross diversion rate as specified in Division 85 of the Oregon Administrative Rules. Based on Refuge observations, return flows are small in comparison to the diverted volume. The only significant non-Refuge diversions between the inflow gages (I) and the outflow gage (O_1) are at Dunn and Sodhouse dams. These diversions are at the lower end of the valley and benefit from any return flows entering the Blitzen upstream of the dams. Since the intent of water use reporting is (at least in part) to provide information on water availability, the approach outlined above is the most appropriate.

Potential sources for error include the estimates of spring flow, neglected ground water inflow/outflow, the Mud Creek contribution (see Appendix A), and the estimate of ungaged outflow. Preliminary discharge data during low flow conditions suggests ungaged inflows account for about 21% of the total inflow (Table 2). During the snow melt season, relative error from ungaged sources will be considerably less.

Table 2
October 1995 Discharge Data

	Discharge (cfs)	% of Total
Blitzen R. Below Page Spring Dam	20.7	25
East Canal	28	33.8
West Canal	4	4.8
Bridge Creek	11.5	13.9
McCoy Creek	7*	8.5
Mud Creek	0.6*	0.7
Springs	11*	13.3
Total	82.8	100

* estimated

During the irrigation season, monthly flow volumes will be compiled and the combined monthly net water use volume for the irrigation water rights identified above will be calculated using eq. 3. The results will be the basis for our water use report for these water rights.

During the non-irrigation season, especially when there is significant early run off, water is diverted out of the Donner und Blitzen river and tributaries and used to fill ponds. To quantify this water use, the same methodologies described above for irrigation use under Certificates 28524, 15217, and 14367 will be used. Prior to the start of the irrigation season on March 15, the net monthly water use for the ponds will be calculated. Since it is not possible to single out individual ponds, the total quantity calculated will be reported as a measure of the combined pond use.

Sodhouse Spring
Water Right: Certificate 7343, Certificate 70427

Sodhouse Spring is located approximately 500 ft north of Refuge headquarters. Water is used to fill Sodhouse Spring pond, which provides an excellent wildlife viewing area for Refuge visitors. Water from Sodhouse Spring pond passes over an existing flashboard riser structure and empties into the Blitzen river. The Service holds certificate 7343 which allows the use of 15 cfs from Sodhouse spring for the maintenance of Malheur Lake. The Service also has "Ponds Bill" certificate 70427 for 24 acre-feet of storage at Sodhouse Spring pond.

Method of Measurement

The most practical method of measuring water use from Certificate 7343 is to improve the existing flashboard riser structure such that it can be used as a weir. This would require the following improvements:

1. Move the existing fish screen that covers the opening of the riser.
2. The inspection and replacement (if necessary) of flashboards.
3. The installation of a staff gage to measure water surface elevation.
4. The establishment of a reference mark on the riser relative to the staff gage. This will allow crest elevation to be determined easily regardless of the addition or removal of flashboards.

The staff gage at Sodhouse Spring Pond pond will be read by Refuge staff every three days as the Division 85 rules stipulate. Alternatively, a data logger could be installed at his location. Stage data would then be expressed in terms of discharge by the weir equation in the form of:

$$q = CLH^{1.5}$$

where q is the discharge in cfs, L is the crest length in feet, H is the head above the crest in feet and C is the weir coefficient for a suppressed sharp-crested weir. Discharge data will be expressed in terms of volume.

The stage data collected will also provide the water use quantification for Certificate 70427. Division 85 rules require the reporting of reservoir contents for storage water rights on or about the same day of each month. Since this pond is spring fed and is consistently full, it is anticipated that the range of stage fluctuation will be small. The surface area and capacity information collected for the "Ponds Bill" filing will be utilized to develop an estimated capacity curve to cover the anticipated range of stage fluctuations. Monthly reservoir contents will be reported from the stage data and capacity information.

Krumbo Creek and Krumbo Reservoir

The Refuge uses water from Krumbo Creek for storage,irrigation, recreation, and maintenance of Krumbo Reservoir. Seven water rights have been issued by the state for water use in this area of the Refuge. Measuring water use for these rights can be achieved by quantifying the inflow and outflow of Krumbo Reservoir, and measuring its contents. The specific methods used for each water right are described below.

Water Rights: Certificate 28524, Permit 50750
Method of measurement

The above listed rights are maintenance rights for Krumbo Reservoir. Beneficial uses under Certificate 28524 and Permit 50750 are the maintenance of the reservoir for wildlife habitat and public recreation, respectively. Maintenance of the reservoir requires water to be diverted from Krumbo Creek to replace evaporative and seepage losses from the reservoir. The quantity of water used for maintaining levels in the reservoir can be obtained from measurements of inflow.

A gaging station located approximately 3 miles upstream of Krumbo Reservoir was installed in 1991, and consists of a data logger that records water surface elevation in a controlled reach of Krumbo Creek. Data are transmitted to the Bureau of Reclamation office in Boise, Idaho. Discreet values of water surface elevation, and mean daily values are achieved in a data base. These data are accessible through telephone modem. A rating for the channel is presently being developed by Service staff and the Harney County Watermaster.

The point of diversion for these water rights is located at Krumbo Dam. Although Division 85 rules state water should be measured at the point of diversion, it is more practical to quantify the maintence water right before it enters the reservoir. It is proposed that the Service use data from the previously mentioned gaging station located approximately 3 miles upstream of Krumbo Reservoir. To fully comply with Division 85 rules, the Service intends to conduct seepage runs to determine if there are any losses or gains in flow in the reach of Krumbo Creek between the gage and the reservoir.

Water Right: Certificate 33824; Permit R-11162
Method of measurement

Certificate 33824 allows storage of 1660 acre-ft of water per year in Krumbo reservoir to be used as supplemental irrigation under Certificate 33825 (see below). Permit R-11162 allows storage of an additional 838 acre-ft of water to be used for recreation. During the storage season, water is diverted from Krumbo Creek for storage. Per Division 85 rules, measuring water use for a storage water right simply means measuring the contents of the reservoir on or about the same day each month.

The Service has recently resurveyed the topography of Krumbo Reservoir and generated a new capacity curve for the reservoir. A staff gage is located in the drop structure of the dam. To determine the water surface elevation of the reservoir, the outlet pipe will be shut to prevent any drawdown error and the staff gage will be read. Refuge staff will be responsible for recording the staff gage reading on or about the 15th day of each month. The reservoir elevation data will be converted to storage volume for purposes of water use use reporting.

Water Right: Certificates 33825, 70414, 70424
Method of Measurement

Certificate 33825 allows the supplemental irrigation of 640 acres of lands downstream of Krumbo Reservoir. Typically water is released for two to three months of the year. The point of diversion for this water right is the dam, and water use can be measured at the outlet.

Certificates 70414 and 70424 are "Ponds Bill" certificates which cover a combined 78 acre-feet of storage in Krumbo Pond and Krumbo Swamp. Water to fill these ponds is passed through Krumbo Dam and can also be measured at the outlet.

Outflow from Krumbo Reservoir is discharged into Krumbo Creek through a 30 inch diameter pipe. The flow rate is regulated by a screw-gate located in the drop structure. Presently, no measuring device exists at this location; however, there are plans to have one installed. The device under consideration will measure discharge through the outlet pipe. The proposed device is a Flo-tote Model 260 made by Marsh-McBirney Inc. This device is able to measure and record discharge in partially filled pipes. A sensor will be installed in the outlet pipe, and values of velocity and depth will be used to calculate discharge at user-specified intervals. Data will be retrieved as needed for water use reporting requirements.

During the irrigation season monthly discharge volumes will be determined and reported as use under Certificate 33825. During the non-irrigation season, monthly flow volumes will be reported for the combined storage of certificates 70414 and 70424.

Water Rights In and Around Malheur Lake
Certificates: 15194, 15195, 15197*, 15200, 15203, 15204, 15206, 15208, 15212, 15213, 15214, 15218, 15219, 15224, 15231, 15232, and 29007**

The Refuge holds 15 water rights for the use of Donner und Blitzen river water to irrigate lands around the perimeter of Malheur Lake. The source of water for Certificate 29007 is given as Malheur Lake. Four (4) of these rights list a particular ditch or ditches which supply water to the place of use. The remaining 12 do not have a point of diversion but are irrigated by "natural overflow".

The ditches associated with water right certificates 15197, 15208, 15231, and 29007 were destroyed during the floods of the 1980's. The associated land continues to benefit from Donner und Blitzen River water, but now it is through "natural overflow" like the other 12 water rights. The place of use for all 16 water rights is in the area described in the 1931 State Engineer's report as lying between the Meander of 1877 and the water surface of Malheur Lake. The available water supply for these lands was quantified at the Voltage Station (McAllister, 1931). This station was just downstream of our current measuring site below Sodhouse Dam.

The Refuge also has a 200 cfs water right (Certificate 15232) for the use of Donner und Blitzen River water for the maintenance of Malheur Lake. This right is for year around use and lists "natural overflow" as the point of diversion.

* 140 acres of the place of use for this water right is not owned by the Refuge.
** Lists Malheur Lake as the source, but receives water in the same manner as the Donner und Blitzen decreed rights.

Method of Measurement

The low gradient of the river below Sodhouse Dam and the "Natural Overflow" diversions do not allow the measurement of water use associated with each individual water right. However, the Sodhouse gage can be used to measure them collectively. During the irrigation season the reported monthly volumes will include water used under all of the above mentioned water rights. During the non-irrigation season, the monthly volumes reported will be for water used under Certificate 15232 only.

Silver Creek
Certificates 14052 and 14041

Water is used under these rights for irrigation on the Double O area of the Refuge (Figure 1). Silver Creek enters the Refuge from the north and after crossing the Double O area it empties into Harney Lake. The head waters of Silver Creek are located a significant distance to the north and there are numerous diversions upstream of the Refuge. Today flows rarely reach Harney Lake due to upstream diversions.

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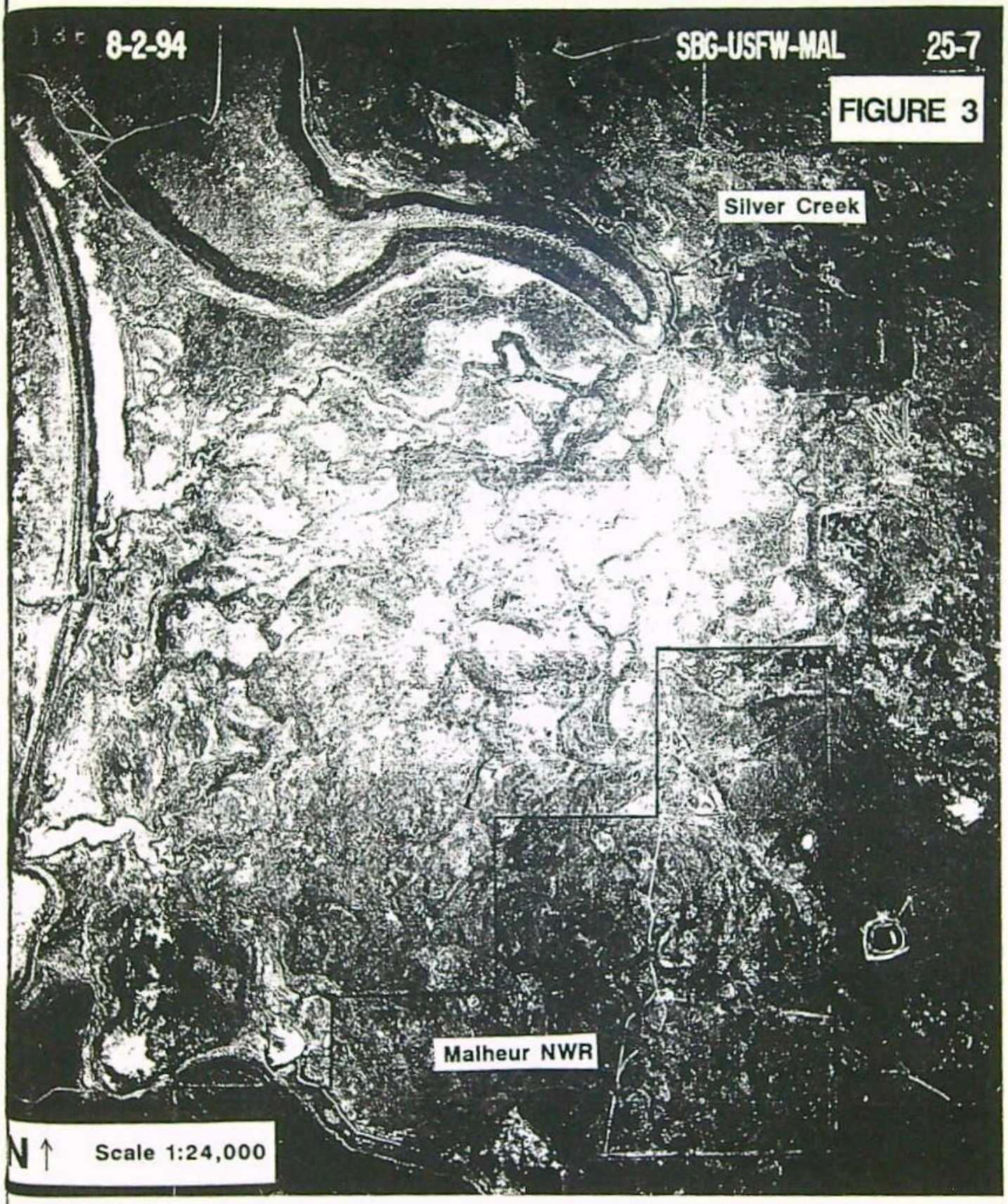

North of the Refuge boundary, the Silver Creek channel has been blocked by a series of low level dams and dikes in an effort by upstream diverters to spread the water out to irrigate their pasture and hay fields. These obstructions along with the low gradient in the area cause water to enter the Refuge through a series of poorly defined channels (Figure 3). During the runoff season, much of the Refuge irrigation is the result of overland flow. Less frequently, water collects in the Refuge ditch system and is distributed for irrigation. The water right certificates and the Decree do not list a point of diversion other than Silver Creek and tributaries.

For these reasons measuring water use for these water rights is difficult. There appears to be few measuring options, since it is difficult to predict when and where Silver Creek water will enter the Refuge. When it does, it is through numerous poorly defined channels which do not provide adequate measuring opportunities. A method of estimation is described below.

Irrigation begins at the north end of the Refuge where the Silver Creek channels cross the Refuge boundary. Irrigation progresses in a southeasterly direction. Depending on the volume of runoff and amount of upstream diversions, all or some portion of the acres identified in these certificates are irrigated. If the areal extent and timing of irrigation on the Refuge is known, it would then be possible to estimate the volume of water used monthly. Although this is not a direct measurement of a quantity of water used, it may provide a reasonable estimate for the purposes of water use reporting. Refuge staff will provide the estimate of the area and duration of irrigation, and the Regional Office will estimate monthly volumes of water use for reporting to OWRD.

Double O Area"Ponds Bill" Certificates
70408, 70419, 70420, 70421, 70426, 70428, 70429, 70440, 70441, 70452, 70453, 70454, 70455, 70456, 70457.

The Service holds 15 "Ponds Bill" certificates for ponds in the Double O area of the Refuge. These ponds receive water from a variety of sources including Silver Creek, Warm Creek and Double O Springs. Applications were filed for these ponds based on the estimated maximum capacity of the pond. Detailed topographic surveys were not done and stage/capacity data is not currently available.

Unlike the ponds in the Donner Und Blitzen Valley there are no alternative means of estimating water use in these ponds. Therefore, the Service will conduct topographic surveys, develop stage/capacity tables and install staff gages at each of these ponds.It is anticipated that this effort will take several years to complete

Once this work is completed Refuge staff will measure and record water surface elevations for each pond monthly. Elevation data will then be converted to monthly volumes of storage which will be reported to OWRD.

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Appendix A
Estimation of flow from Mud Creek

Mud Creek is an ungaged tributary to the Donner und Blitzen river located near Frenchglen, Oregon. Mud Creek crosses the Refuge boundary approximately 1 mile upstream of the confluence with the East Canal. The contribution of Mud Creek to the total flow of the Blitzen River may be significant, and monthly measurements or estimates would improve the accuracy of the Blitzen river water budget.

As mentioned, no stream gage exists at Mud Creek. Field observations of flow have been infrequent and qualitative. One discharge measurement was performed by Service staff. Plans to install a permanent water measuring device were considered, but were rejected after a site visit. The reasons for this decision were: a) poor channel stability, b) the "flashy" nature of the flow regime, and c) difficult access to Mud Creek by Service staff.

An alternative to the installation of a permanent water measuring device at Mud Creek is to estimate flow using a "similar basins" approach. Data from nearby gaged stream is used to estimate flow in the ungaged stream. Lystrom (1970) lists the following parameters to be considered when selecting a gaged basin to be used:

1. Basin area
2. Channel length
3. Mean basin area
4. Area of lakes and ponds
5. Mean basin elevation
6. Percent forest cover
7. 2 year, 24 hour precipitation
8. Temperature index (mean minimum temperature in January)
9. Soil characteristics

Bridge Creek is the adjacent watershed to the north of Mud Creek (Figure 1a). The watersheds of Bridge Creek and Mud Creek are nearly identical based on the above-mentioned basin characteristics. Table 2a compares the basin characteristics of the two watersheds. Temperature data were not available for either basin, but are assumed to be approximately equal due to the proximity of the basins. Additional characteristics including soils, geology and land use effects were researched and found not to differ among basins.

The USGS maintained a stream gaging station on Bridge Creek from 1911 to 1970. Values of mean monthly discharge are shown in the Table 1a. The Service reactivated this station in 1993. The annual hydrograph for Bridge Creek is shown in Figure 2a, and is derived from data from 1930 to 1970. Data prior to 1930 are incomplete and were not used. The hydrograph is typical of small streams in a snow melt flow regime. The hydrograph for Mud Creek would be expected to have the same approximate shape with the peak occurring in May and a period of base flow in the summer months.

The equation that describes the linear relation of discharges of similar basins is given as:

$$Q_M = [A_B/A_M]Q_B \qquad \text{(eq.1a)}$$

where Q_M and Q_B are the discharges in Mud and Bridge Creeks, respectively; and A_B/A_M is the ratio of watershed areas. Since the areas of the basins differ only slightly, A_B/A_M approximates unity, and the term can be neglected to give:

$$Q_M = Q_B \qquad \text{(eq. 2a)}$$

A field measurement made in October 1995 is the only discharge data available for Mud Creek. Flow was measured at 0.6 cfs. The flow at Bridge Creek was measured immediately after, and was 11.4 cfs. This difference in base flow was not expected considering the similarity of the basins, and suggests eq. 2 may not be valid at all times of the year. The difference in base flow between the two basins is due to either differences in soils characteristics or the source areas of springs supporting the two creeks

A commonly used method to estimate precipitation/runoff characteristics of watersheds has been developed by the Natural Resource Conservation Service (NRCS, formerly known as the Soil Conservation Service, SCS). An index is used to predict runoff volumes as a function of hydrologic properties of the soils (i.e., infiltration rates, water holding capacity), and land use. Soils are assigned a curve number based on these properties. The higher the curve number, the greater runoff volume for a given precipitation event, and vice-versa. It should be noted that this index is based on empirical rainfall/runoff characteristics of basins, not runoff due to snow melt. However, it does provide some indication of that proportion of annual precipitation that is available for ground water storage.

A large difference in curve numbers would suggest a difference in the temporal distribution of annual runoff volumes. Specifically, if the Bridge Creek basin had a significantly lower curve number than Mud Creek basin, this would indicate that a greater proportion of the precipitation infiltrates and resurfaces as base flow later in the season.

Soil maps were obtained from a preliminary soil survey conducted by the NRCS. Soil types were delineated in each basin and the proportionate area of each was determined with a planimeter. A curve number was determined for each watershed based on area weighted curve numbers of soil types. The results, shown in Table 3a, indicate the curve numbers of each basin do not vary beyond the expected error of measurement. Therefore it does not appear that a difference in soil type causes the observed difference in base flow.

The other possible explanation for the difference in base flow is that the source area for the springs supplying the Bridge Creek base flow is outside the Bridge Creek drainage basin. Although this explaination can not be verified without further study, the service assumes this is the cause for the observed difference in base flow. No real benefit to the water budget would be

gained by verification of this point and the Service does not plan to pursue it.

The Service plans to conduct additional paired measurements of Mud Creek and Bridge Creek over the next 12 months to better define the discharge relationship between the two streams. Until the difference in base flow is better defined, the service will use eq. 2a to estimate flow from Mud Creek for the purposes of developing a water budget for the Donner und Blitzen River. Based on the preliminary data, the total input to the Blitzen Valley system during base flow conditions will be overestimated as will Refuge water use during this period. Although limited empirical evidence suggests Mud Creek may contribute significantly less water to the Blitzen Valley, use of eq. 2 is the most conservative approach for water use reporting. Further, a significant difference in stream flow is likely to exist only during base flow conditions, as factors that determine rates of runoff volumes during the snow melt period (i.e., snowpack, temperature) are assumed to be approximately equal.

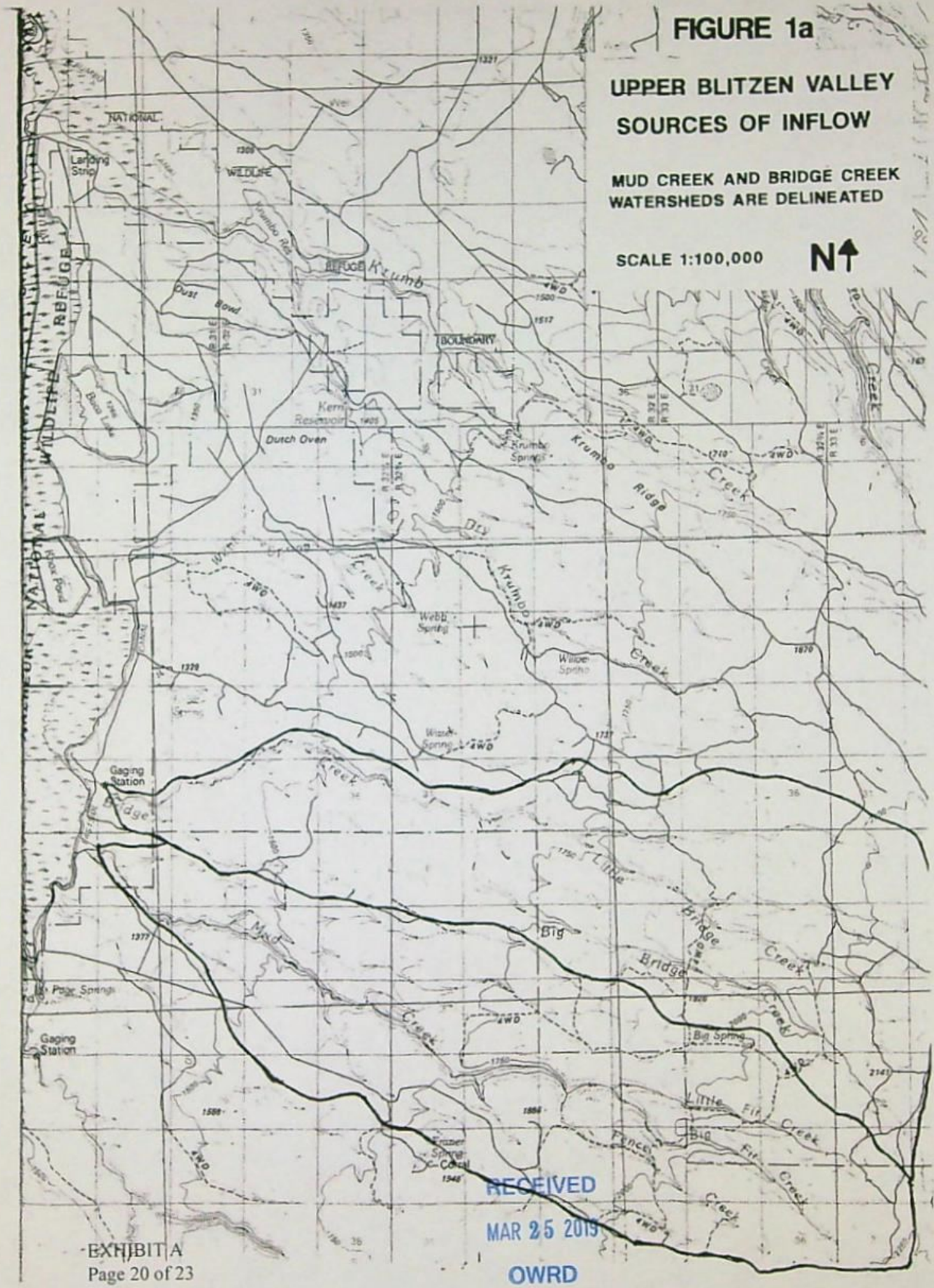

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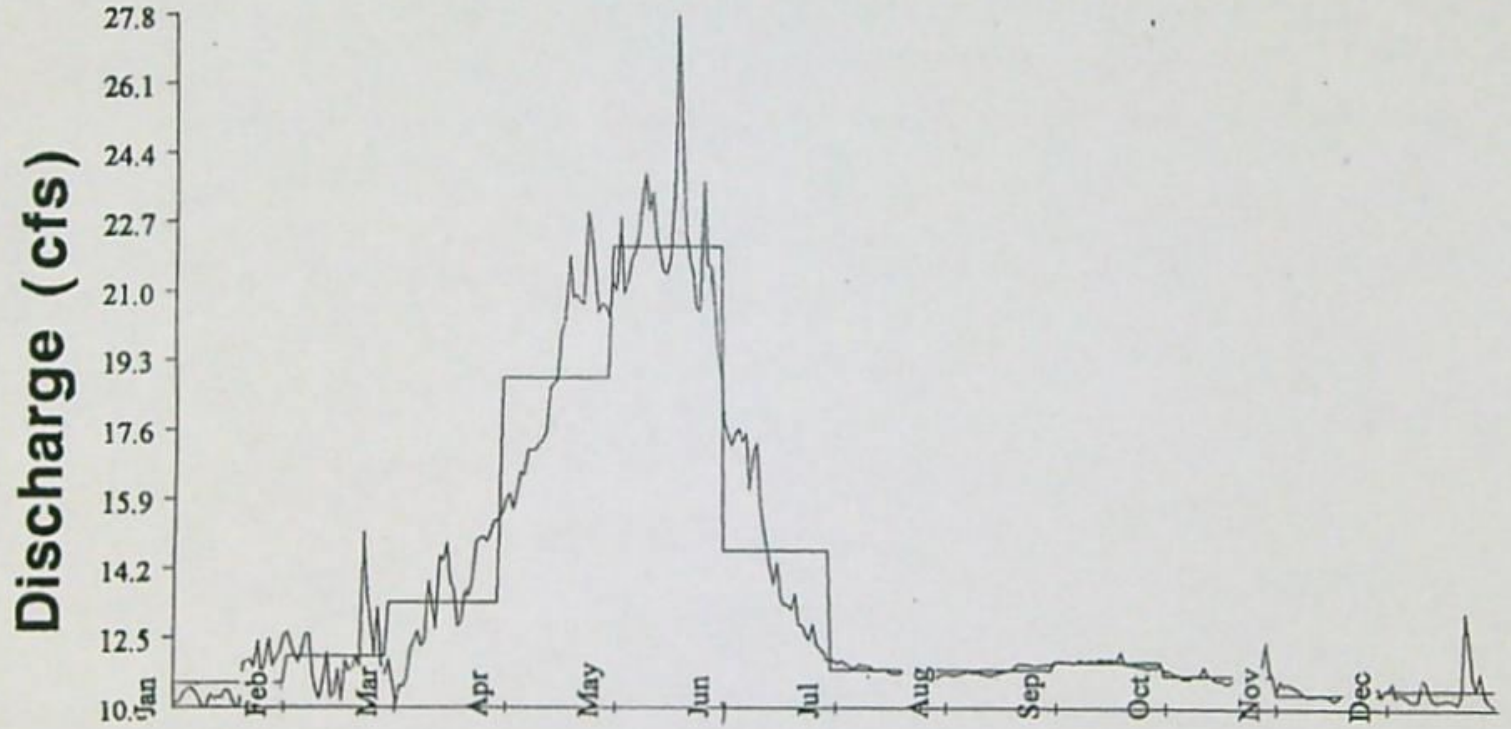
FIGURE 2a

BRIDGE CREEK NR FRENCHGLEN, OREG.



Mean monthly and mean daily values plotted.

TABLE 1a

Mean Monthly
Discharge Data (cfs)
for Bridge Creek
Malheur NWR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1930	11.733	11.032	10.467									
1938	7.774	10.964	14.258	34.333	24.871	13.457	11.419	12	12.333	12.258	13.8	12.548
1939	12	11.071	34.903	16.867	12.065	11	10.5	10	10	10.5	10.4	9.097
1940	8.29	10.586	12.774	18.4	12.387	10.1	9.935	9.419	10.367	12.774	11.933	9.968
1941	10.194	14.571	12.065	13.067	18.871	14.8	10.774	11.29	11.1	10.839	10.127	9.748
1942	11.565	12.286	17.839	33.267	44.194	22.767	15.129	14.355	14.6	14.129	14.1	15.71
1943	13.935	20.75	21.484	31	20.065	24.633	16	16	15.267	14.742	14.2	13.29
1944	13.387	12.931	13.065	14.233	14.065	18.867	13	13	13.033	14.194	13.5	12.774
1945	11.548	11.321	14.968	25.733	40.871	22.733	14.129	12.419	13.6	14.29	14.1	13.968
1946	13.645	14.321	14.452	15.267	17.516	14.333	11.839	13.677	13.633	12.161	11.733	11.581
1947	11.387	12.036	11.323	15.8	12.774	11.467	10.548	9.884	9.95	9.826	9.433	8.335
1948	9.955	8.234	11.858	23.713	37.968	16.933	11	12.323	15.833	11.839	11.667	11.548
1949	11.097	11.929	13.129	21.433	20.226	13.967	12.419	12	12	11.484	11.3	11
1950	11	9.996	11.894	16.533	17.065	13.6	11.258	11.935	12	10.871	10.3	9.894
1951	10.977	12.35	10.871	17.233	18.194	10.98	10.645	10.319	10.407	10.381	11	11
1952	9.668	10.9	14.684	37.333	40.355	20.133	13.581	12.516	14	14.194	14.767	14.323
1953	15	14.357	12.871	12.733	21.484	21.833	13	13	12.433	13	12.933	12.581
1954	12.323	10.893	13.052	21.3	14.194	11.667	11	12.161	12	12	12	11.581
1955	10.471	9.104	9.287	12.293	25.419	12.6	10.484	11.097	12	12	11.5	15.252
1956	11.635	11.379	15.645	21.967	24.387	14.133	12.29	12	11.633	12.161	11.233	12
1957	12	24.571	21.419	26.633	43.613	14	13.355	14	14	12.806	12.733	13.742
1958	13.806	20.5	12.742	22.533	21.935	14.267	13.097	12.613	13	13	12.467	12
1959	11.581	11	11	11.367	10.323	10.333	9.758	8.3	8.42	8.048	7.48	7.439
1960	6.987	8.997	12.506	15.477	16.484	11.133	11.516	11.258	10.453	10.161	9.193	7.658
1961	7.774	7.082	8.103	8.91	8.51	8.413	7.9	8.161	7.65	6.574	6.4	6.187
1962	5.713	5.246	7.774	15.767	12.119	10.563	10.774	10.839	10.393	10.842	10.733	10.319
1963	10.574	14.493	9.59	19.993	20.645	12.033	11	11	11	11	10.767	10.626
1964	9.365	8.621	9.681	14.073	22.645	20.933	10.213	10.484	11	11	11.033	14
1965	17.129	14.464	12.065	23.667	20.774	15.9	12.742	13	13.2	13.129	13.233	12.484
1966	11	11.036	11.29	11.967	11	10.867	11	11	11.367	9.426	9.533	9.116
1967	10.806	10.279	10.577	16.867	36.226	18.567	12.194	13.258	12.667	12	13	12.097
1968	11.516	11.448	10.387	9.87	9.503	9.25	9.51	8.632	7.89	6.868	7.043	6.597
1969	11.39	9.032	15.035	26.7	25.452	13.333	11	12.226	13	12.419	12.5	12
1970	17.226	11.714	12.484	12.867	20.161	12.533	11.903	11.839	12			
MEAN	11.3	12.0	13.4	19.4	21.7	14.6	11.7	11.7	11.9	11.6	11.4	11.3

TABLE 2a

Summary of basin characterisitcs
Mud Creek, Bridge Creek

	Bridge Creek	Mud Creek	% change
Area (sq mile)	29.0	28.2	-6.2
Channel Length (mile)	12.8	12.1	-5.5
Mean slope	0.040	0.044	+10
Area of lakes (% of total basin area)	< 1	< 1	0
Mean elevation (ft)	5890	5920	+0.5
% Forest cover	11.5	14.2	+2.3
2 year, 24 hour precipitation (in)	1.0	1.0	0

1. Physiographic parameters estimated from USGS topographic maps.
2. Precipitation data from U.S. Weather Bureau.

TABLE 3a

SCS Curve number determination
Mud Creek and Bridge Creek
Malheur NWR

			Mud Creek		Bridge Creek	
Soil Series	Hydrologic Group	Curve Number	Area Weight	Weighted Curve Number	Area Weight	Weighted Curve Number
Pertny	D	84	0.0521	4.3764	0.03605	3.0282
Lonenly	C	79	0.0553	4.3687	0.02756	2.17724
Robson	D	84	0.0332	2.7888	0.05945	4.9938
Westbute	C	79	0.0292	2.3068	0.07242	5.72118
Ninemile	D	84	0.2445	20.538	0.0153	1.2852
Hackwood	B	69	0.1523	10.5087	0.1729	11.9301
Ninemile assoc.	D	84	0.067	5.628	0.2049	17.2116
Croesus	C	79	0.2203	17.4037	0.06914	5.46206
Pearlwise	B	69	0.0112	0.7728	0.0442	3.0498
Gillispie	D	84	0.1347	11.3148	0.178	14.952
Westbutte Loam	C	79	N/A	N/A	0.1201	9.4879
Total			0.9998	80.0067	1.00002	79.29908

1. Soil data from NRCS
2. Curve numbers for "pasture or range" land use, soil hydrologic condition is "fair"

References

Lystrom, David 1970, Evaluation of the Steamflow-Data Program in Oregon: U.S. Department of the Interior, Geological Survey, Water Resources Division Open file Report, 28 p.

McAllister, L.A. 1931, Report of Water Supply, Use, and Duty of Water of Donner Und Blitzen River and its Tributaries, Harney County, Oregon. Made in Connection with the Adjudication of Water Rights under the Direction of Chas. E. Stricklin, State Engineer, 44 p.

Exhibit B

WATER MEASURING PLAN FOR MALHEUR NATIONAL WILDLIFE REFUGE IN COMPLIANCE WITH ORS 537.099: WATER USE REPORTING FOR GOVERNMENT ENTITIES

DIVISION OF ENGINEERING REGION ONE
FISH AND WILDLIFE SERVICE SEPTEMBER 1996

Updated March, 2019

Tim Mayer, Supervisory Hydrologist, Water Resources Branch
US Fish and Wildlife Service, Regional Office, Portland, Oregon

(Updated information is designated as such and shown in italics throughout the plan)

Introduction

Oregon Revised Statutes (ORS) 537.099 requires government agencies holding water rights in Oregon to report annual water use. Chapter 690 Division 85 of the Oregon Administrative Rules sets forth regulations specifying when and how the reporting is to be done. Reports must provide information for each water right held including the quantity of water used each month of the year, the source of water, point of diversion (POD), and the methods employed to measure water use. Reports for the water year (ending September 30) must be submitted to the Oregon Department of Water Resources (OWRD) by the end of each calendar year. The purpose of water use reporting is to ensure compliance with water quantity and use(s) specified in the state-issued water right certificate.

The U.S. Fish and Wildlife Service (Service) holds many water rights on National Wildlife Refuges in Oregon, and is expected by the state to comply with its requirements. As a matter of comity without agreeing to the State's authority to administer the Service's water rights, the objective of this report is to propose a simplified water use reporting strategy for Malheur National Wildlife Refuge (Refuge) that is acceptable to OWRD.

Acceptable methods to determine water used by a particular water right are outlined in Division 85. These methods are the same as those used by the U.S. Geological Survey (USGS) for hydrologic studies, and are the standard in substantiating water right claims in adjudications and other legal proceedings.

Since water use reporting began in water year 1992, the Refuge staff has provided estimates of water use for the requested water rights and these estimates have been reported to OWRD. With the assistance of the Regional Office, the Refuge staff have installed recording equipment and are developing rating curves at a number of locations on the Refuge. This is the first step in an attempt to comply with the accuracy standards required in the Division 85 rules. The data collected from these sites will be utilized in future water use reports. Because of the complexity of the hydrology and the multitude of water rights and diversions involved, the Refuge requested assistance from the Regional Office to develop a simplified yet comprehensive water use measuring and reporting strategy. The resulting strategy described in this report is designed to satisfy OWRD requirements and still be feasible for the Refuge in terms of cost and staff time.

March 2019 Update: Although the initial plan was for Refuge staff to be responsible for water monitoring, the water monitoring responsibilities are now shared between Refuge staff and the Water Resources Branch (WRB) in the Regional Office. The WRB maintains all continuous gages, equipment, and rating curves and collects periodic flow measurements as needed and the Refuge staff record monthly pond and reservoir levels.

Background

Malheur NWR is located in Southeast Oregon approximately 270 miles southeast of Portland, Oregon. Malheur is one of the largest wildlife refuges in Region 1 (Figure 1). It encompasses 185,000 acres of lands in the Donner und Blitzen River and Silver Creek watersheds, including Malheur and Harney Lakes. The elevation is approximately 4100 ft at Refuge headquarters. The climate is arid, with the mean annual precipitation approximately 11 in/yr. The hydrology of the Refuge consists of a complex system of dikes, diversions, irrigated land, natural and enhanced wetlands, and lake habitat. Refuge water sources include inflows from springs, streams, ground water, and overland flow.

The Refuge holds numerous water rights that allow water to be used for Refuge objectives. Individual measurement of each water right at the point of diversion (as Division 85 requires) would be impractical due to the complexity of the system. This report proposes the best alternatives. The methods proposed for the Donner und Blitzen Valley are very similar to those used in the 1931 State Engineer's report on water use (McAllister, 1931).

Donner und Blitzen River and Tributaries Above Sodhouse Dam
Water Rights: Certificates 28524, 15217, 14367

The Refuge diverts water from the Donner und Blitzen River to be used for irrigation in the Blitzen Valley. Water use for this area is allowed by the above-listed water rights. Certificate 28524 allows the maximum diversion rate of 0.025 cfs per acre from March 15 to June 15 and 0.0125 cfs per acre from June 15 to October 15. This water right covers approximately 40,000 acres of land. Certificates 15217 and 14367 use water from McCoy Creek and Bridge Creek, respectively. The place of use for these water rights is adjacent to lands covered under Certificate 28524, and water is supplied through the same ditch works. Therefore, the methods described below will estimate water use for Certificates 28542, 15217, and 14367.

March 2019 Update: In July 1999, the Service filed change applications with OWRD to change the purpose of these rights from irrigation to wildlife refuge management, which includes uses of aquatic life protection, wetland enhancement, riparian enhancement, domestic, irrigation, stockwater, fire control, wildlife recreation, and dust control. The Service also expanded the place of use to the entire refuge, with limits imposed on what could be irrigated or maintained as wetlands/ponds, and added additional points of diversion. The Service also filed for a new water right, Permit 54164, for wildlife refuge management for diversion and use of Blitzen River water outside of the irrigation season. These applications and changes have all been approved by OWRD.

Malheur National Wildlife Refuge Area Map

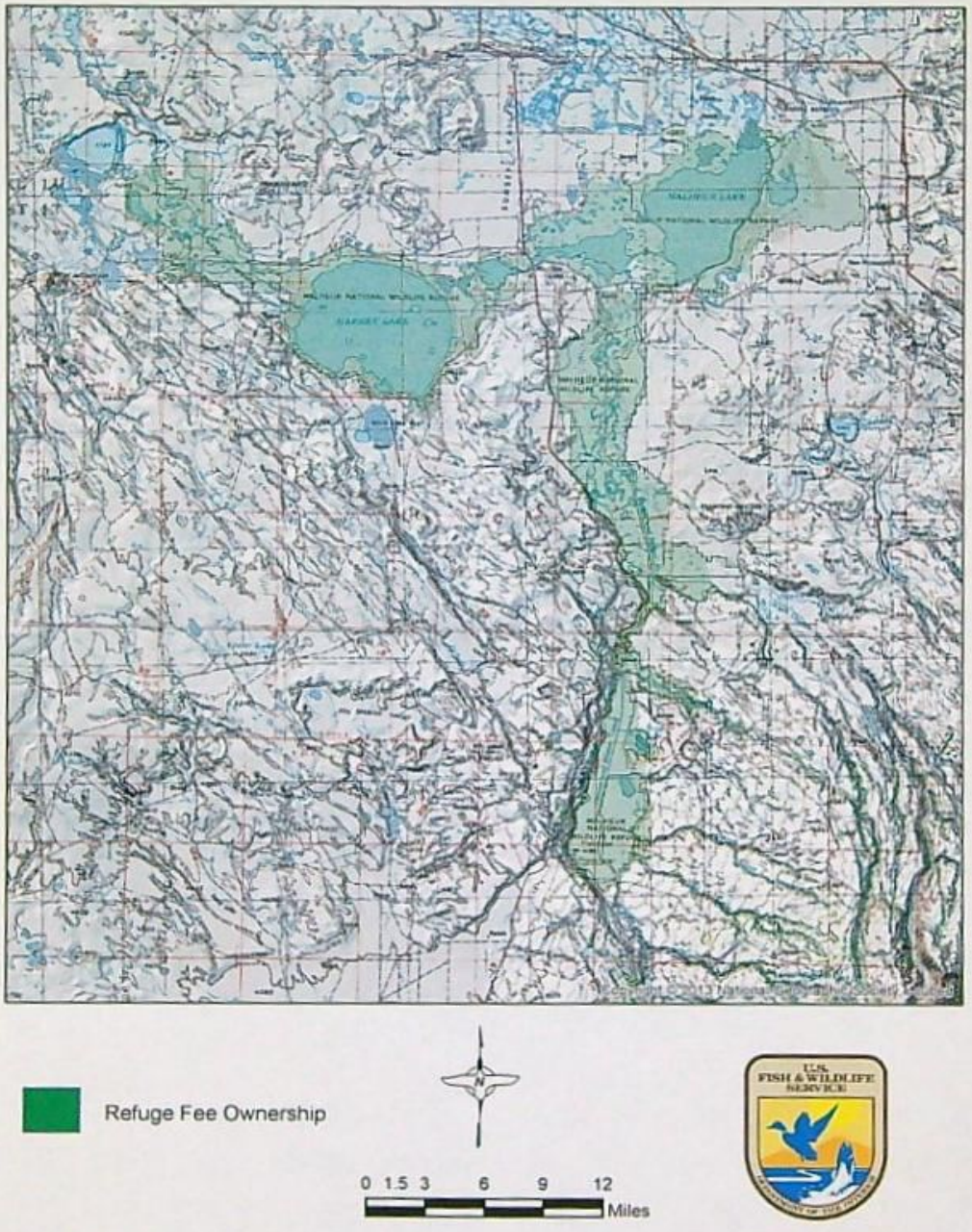


Figure 1. Area Map of Malheur National Wildlife Refuge

"Ponds Bill" Certificates

69460, 70409, 70410, 70411, 70412, 70413, 70415, 70416, 70417, 70418, 70422, 70423, 70425, 70430, 70431, 70432, 70433, 70434, 70436, 70437, 70438, 70439, 70442, 70443, 70444, 70445, 70446, 70447, 70448, 70449, 70450, 70451, 70458, 70459, 70461, 70462, 70463, 70464, 70465, 70466, 70467, 70468, 70469, 70470, 70471, 70472, 70473, 70474.

In 1994, the Service submitted "Ponds Bill" applications for 50 ponds which receive water out of the Donner und Blitzen River and tributaries above Sodhouse Dam. The above listed certificate numbers were issued for 48 of these ponds. The 2 certificates not listed above are covered under the section on Krumbo Creek and Krumbo Reservoir below. The combined pond storage capacity is 9,297 acre-feet. Prior to the irrigation season, water diverted out of the Donner und Blitzen River is used to fill ponds. In general, the same diversion works and delivery systems used to divert and apply irrigation water are used to supply water to the ponds.

Stream flow in the Blitzen River is primarily supplied by snow melt on Steens Mountain. Numerous springs contribute to the flow and maintain the base flow after the spring runoff. The Blitzen River crosses the southern Refuge boundary approximately 600 ft upstream of Page Springs dam. The Blitzen River flows north approximately 43 miles through the Blitzen Valley, then empties into Malheur Lake. There are no hydrologic outlets to Malheur Lake. The elevation drop from the southern Refuge boundary to Malheur Lake is about 130 ft, thus the approximate mean slope of the Blitzen River on Refuge lands is 0.06 %, an extremely low gradient. Significant tributaries to the Blitzen River within this stream reach include Mud Creek, Bridge Creek, Krumbo Creek, and the Diamond Canal system.

Historically, seasonal inundation of the Blitzen Valley (caused by the low slope of the river channel) created large areas of natural wetland habitat. During the period of settlement of the Blitzen Valley, approximately 18 miles of the Blitzen River were channelized, and much of the wetland areas were drained to provide lands for agriculture. Many of the structures, canals, and dikes that exists in the Blitzen Valley today were installed during this period. Since the lands in the Blitzen Valley were acquired by the U.S. Government, efforts have been made by the Refuge to restore the original wetland habitat.

Division 85 of the Oregon Administration Rules states that water use is to be measured at or near each point of diversion by means of a rated channel, a flume, or a weir. Measurement of the diversion rate must be made at least once every three days, and accuracy is to be within 15% of the true value. This is impractical in the case of the Blitzen Valley due to the large number of diversions (there are at least 20 along the Blitzen), and the small number of Refuge and Regional Office employees available to conduct the measuring. Furthermore, the small elevation gradient causes the system to be continuous in a hydrologic sense; and conducting velocity, flume and weir measurements at discrete points in the system are difficult or infeasible due to backwater effects. It is therefore problematic to measure water

use for the above-mentioned water rights as outlined in Division 85, and alternative methods are proposed.

Methods of Measurement

An alternative method of measuring water use is to develop a simplified water budget for the Blitzen Valley system. This was the approach taken by the State Engineer in assessing the Valley's water supply prior to the Donner und Blitzen River Adjudication (McAllister, 1931).

A commonly used relation that describes a water budget for a hydrologic system is:

$$I - O = \Delta S/\Delta t \qquad \text{(eq. 1)}$$

where I is the total input, O is the total output, and Δ S/Δ t is the change in storage with respect to time.

To account for numerous inputs and outputs, eq. 1 can be expressed as:

$$(I_1 + I_2 + \cdots + I_n) - O_1 + O_2 + \cdots + O_n = \Delta S/\Delta t \qquad \text{(eq. 2)}$$

Typical input components are surface and ground water inflow from outside the system, and precipitation over the system. Outputs include water leaving the system as surface water, seepage, and evapotranspiration (ET). For the purposes of compliance with Division 85 rules, this analysis is concerned with the quantity of water that is used from the Donner und Blitzen River. There are two components of Refuge water use under these water rights: irrigation and pond storage. Eq. 2 as written would only provide the pond storage component: We are interested in total water use which includes the ET of water applied for irrigation. On page 6 of this report, eq. 2 is rewritten with the term UR which represents total water use and includes both pond storage and ET of water diverted for irrigation.

To estimate water use by the Refuge, eq 2 can be used with the following components:

Inflow:

1. Donner und Blitzen River (including East and West Canal Systems)
2. Mud Creek
3. Bridge Creek
4. Krumbo Creek
5. Diamond Canal System (Inflows from McCoy, Kiger, Cucamunga, and Swamp Creeks)
6. Flows originating from springs downstream of measuring points

Outflow:

1. Mainstem of Donner und Blitzen river below Sodhouse dam
2. Canals that convey water off Refuge property

Assumptions:

1. Net ground water seepage into or out of the system is negligible.
2. Local runoff downstream of the measurement sites is negligible. Given the mean annual precipitation of 11 in/yr and the low topographic relief of the Blitzen Valley, local runoff will be insignificant when compared to inflows from major streams.

Figure 2 is a schematic representation of the Blitzen Valley system showing most of the above-listed inflows and outflows. Presently, there are five sites where continuous water level recorders have been installed to measure streamflow. These stations are equipped with Stevens *AIF* data loggers which are capable of recording stage data at user-specified time intervals. Development of rating curves is necessary to determine the stage/discharge relation for each station. With the exception of Diamond Canal system, preliminary rating curves have been developed. Data collection is continuing and the ratings are being refined. Once ratings have been completed, periodic measurements at the gaging stations will be necessary to ensure accuracy.

March 2019 Update: The Service currently maintains five sites that continuously gage the major inflows in the Blitzen Valley. The five sites include: USFWS Site No 357003 Blitzen River below Page Springs Dam; USFWS Site No 357004 Bridge Creek above East Canal; USFWS Site No 357009 Krumbo Cr Flume blw Krumbo Reservoir outflow; USFWS Site No 357007 McCoy Creek above Diamond Swamp, and USFWS Site No 357005 Blitzen River below Sodhouse Dam. All Stevens equipment at these gages has been updated/replaced with Sutron water monitoring equipment. Rating curves are continually maintained at four of the five sites. The Krumbo reservoir outflow is a flume and a theoretical rating for this structure is used to determine flows here. The Service also maintains a rating curve for low flows at Grain Camp Dam, the mouth of McCoy Creek, and the mouth of Bridge Creek to ensure that the minimum flows required in Permit 54164 are being met at these sites. In addition, the Service provides all the funding for the USGS streamflow gage: USGS Site No 10396000 Donner Und Blitzen River Near Frenchglen, OR, which is upstream of the Refuge.

While the USGS gage is just upstream of the Refuge, the total inflow to the Refuge from the Blitzen River is not simply the gaged streamflow at this site. There is additional inflow into the Blitzen River from Page Springs, located between the USGS gage and the Refuge boundary below Page Springs, that must be accounted for. The inflow from the springs is diffuse and scattered in multiple channels and cannot be gaged directly so we estimate it by difference using the following method:

We take periodic measurements of the flows in the East and West Canals, sum this with the concurrent flow at USFWS Site No 357003 Blitzen River blw Page Springs Dam, and then subtract the concurrent flow at the USGS gage site to estimate the flow from Page Springs, between the Refuge and the USGS

gage (Figure 2). We repeat this several times each season and interpolate between readings. The total inflow to the Blitzen Valley section of the Refuge from the Blitzen River is the sum of the measured flow at the USGS gage and the estimated inflow from Page Springs. We can take the difference between this total inflow and the measured flow at USFWS Site No 357003 Blitzen River below Page Springs Dam to determine what we are diverting in the East and West canals at any one time (Figure 2). The gage at USFWS Site No 357003 Blitzen River below Page Springs Dam also helps us assure that there is adequate flow in the Blitzen River for redband trout at all times. We also measure water and air temperatures continuously at this site.

Inflows to the Refuge originating in the Diamond Valley are difficult to measure. There are two points of inflow onto the Refuge in this area: the Diamond Canal to the north and the South Diamond Canal (Figure 2). Combined flows from Swamp Creek, Kiger Creek, and Cucamunga Creek are collected in the Diamond Canal. All three of these creeks are intermittent and flow mainly in the spring and early summer. The creeks spread into multiple channels that are low-gradient and heavily vegetated upstream of the Refuge and most of the water from this part of the system reaches the Refuge through sheetflow or overland flow during high water. It is nearly impossible to monitor this.

The flow in McCoy Creek goes to the South Diamond Canal, the second point of inflow in the Diamond Valley. The main obstacle to providing flow data at the South Diamond Canal site results from backwater effects at the site and the low elevation gradient between the Refuge boundary and the Blitzen River. A significant rise in the water surface elevation in the Blitzen River causes water to back up into the Diamond Valley, making it impossible to develop at stage/discharge correlation. Alternative means of measuring/estimating flow in the area are currently being investigated and the best practical means will be utilized.

March 2019 Update: The South Diamond Canal site has proved to be the most challenging site managed on the Refuge. The Service has monitored water levels continuously and has attempted to maintain a rating curve at the South Diamond Canal site for many years. We have asked Refuge staff to note when there is backwater conditions, debris build-up, beaver activity, or a change in diversions that affects water levels at the site. However, data from the site is fairly inconsistent and inaccurate at times and is generally rated as poor. In 2014, the site was moved to a different location, still upstream of all refuge diversions, but this site proved to be even worse and the site was moved back in 2015. The plan this year (2019) is to try installing an Acoustic Doppler Velocity Meter (ADVM) at the site. This meter would measure water level and velocity continuously and would use a user-defined channel area to compute discharge continuously. The main challenge with such instrumentation is the high cost of the purchasing the equipment and the considerable effort in maintaining the equipment and processing the data. As a side note, I believe that OWRD has recently abandoned the use of such equipment in their monitoring program because of the considerable cost and effort associated with this instrumentation.

There are other ungaged surface water inflows, including Mud Creek, Krumbo Creek, and numerous springs (Figure 2). Flows from Mud Creek will be estimated on an interim basis using the Bridge Creek data and a similar basins analysis (see Appendix A) (*March 2019 update: This appendix is no longer needed because of a change in methods, see below*). As described in the appendix, the available baseflow data for Mud Creek does not match the estimate from the similar basins analysis. The Service plans to collected paired discharge measurements over a 12 month period and use these data to improve the accuracy of the Mud Creek estimate.

March 2019 Update: It turns out that a similar basins analysis is not appropriate for these two systems because Bridge Creek is a groundwater spring-driven system with consistent flows all year and Mud Creek is a surface runoff system that responds primarily to snowmelt in the spring. The hydrographs are very different, meaning a "similar basins" approach cannot be applied. Periodic flow measurements in Mud Creek were collected from 1997 to 2003 by the Service. The periodic measurements show that the stream flows mainly in the spring and early summer, averaging 4 cfs (n=14), with a minimum of 0.4 cfs, measured 8/21/1997 and a maximum of 20 cfs measured 5/29/2003.

There are major challenges in measuring the inflow to the Refuge from Mud Creek. The closest feasible measurement site is at a remote location in a canyon roughly one mile upstream of the Refuge and only accessible by foot. Downstream of this site, the stream separates into several braided channels that flow into a heavily vegetated, low-gradient, wetland area. The historical measurements made by the Service were collected at the upstream site but it's not clear that measurements at this site represent the actual inflow reaching the Refuge because of the distance upstream from the Refuge and unknown gains/losses in between. Furthermore, the volume of inflow at this site is inconsequential compared to the combined inflow from the Blitzen River and other tributaries. This is true even during the period of higher flows in Mud Creek in spring and early summer because all of the other inflow sources peak at this time as well. For all of these reasons, the Service estimates the inflow from Mud Creek, based on the historic measurements, rather than trying to regularly monitor the stream. Through this update to the measurement plan, we have become aware that we have not been including this inflow as part of the total inflow to the Blitzen Valley in our reporting. We will correct this in the 2018 report.

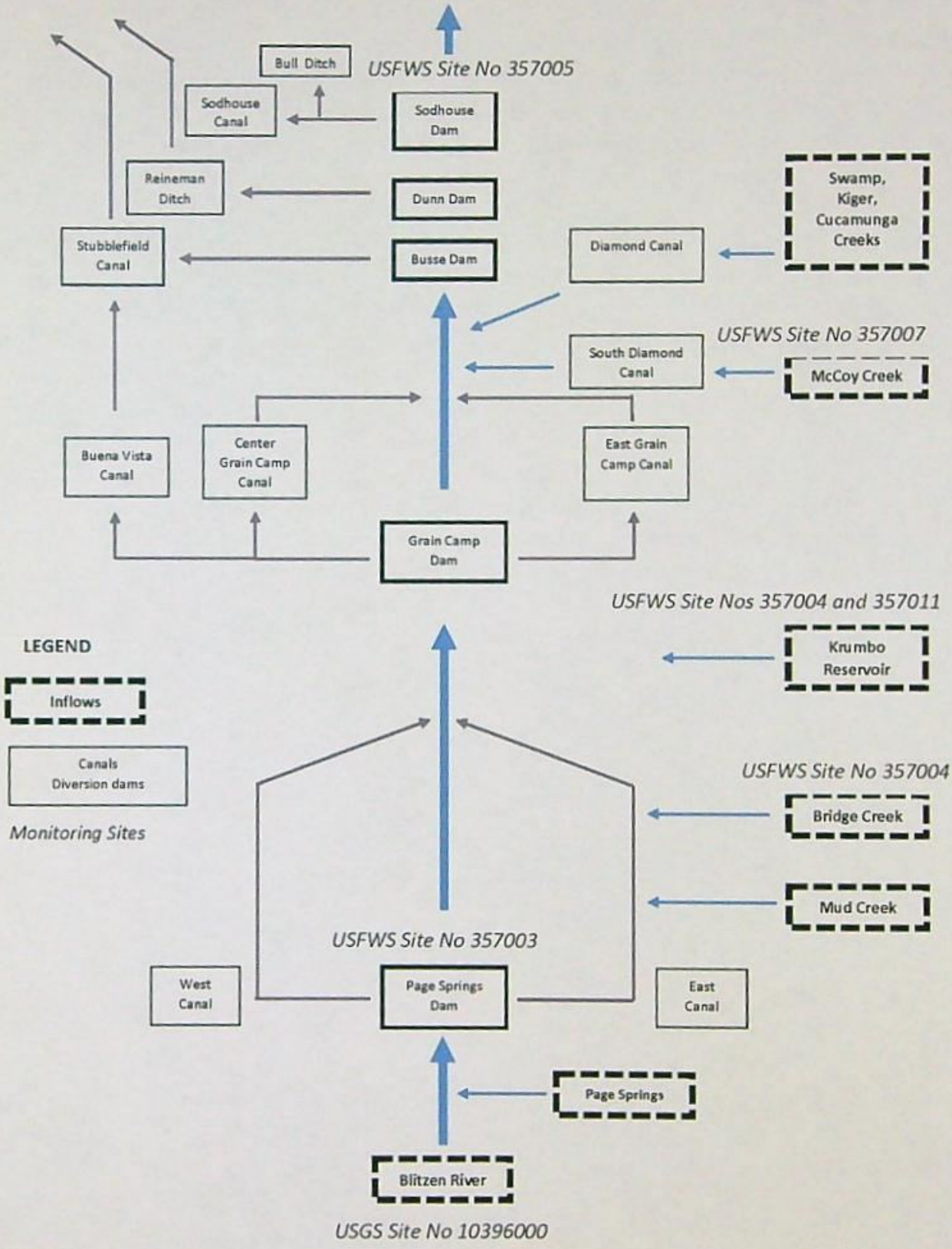


Figure 2. Schematic diagram of the Blitzen Valley showing major structures, canals, diversions and stream gaging stations

Krumbo Creek is a tributary of the Donner und Blitzen River, however the contribution from this source is regulated by Krumbo dam. According to the Refuge staff, water from Krumbo Reservoir is discharged into the reservoir outflow channel downstream approximately two to three times each year. All water released is used for supplemental irrigation on lands adjacent to Krumbo Creek, or in the two Ponds Bill" ponds in the Krumbo Creek drainage and will be reported under the associated water rights. Little, if any, Krumbo Creek water reaches the mainstem Blitzen River and can thus be neglected as an input to the Blitzen Valley water budget.

March 2019 Update: Currently, the Service records staff gage readings monthly in Krumbo reservoir. Those readings are converted to volume using the capacity curve developed for the reservoir by the Service and those volumes are reported annually to OWRD. The outflow from the reservoir is gaged continuously as described in the Krumbo section below. Through this update to the measurement plan, we have become aware that we have been inadvertently including Krumbo Creek outflow as part of the total inflow to the Blitzen Valley in our reporting, despite the fact that it can be neglected because this outflow never reaches the Blitzen river. We will correct this in the 2018 report.

There are numerous springs that exist within the Refuge boundaries that contribute to the total inflow. Direct discharge measurements of each spring would be difficult due to the diffuse flows and backwater effects of adjacent canals. Estimates of flow rates as provided by Refuge staff are given in Table 1. The total of these estimates is added to the total inflow. An attempt will be made to refine these estimates with actual measurements wherever possible.

Table 1 Estimated flow of Ungaged Springs	
Spring Name	Flow (cfs)
Five Mile Springs	2
Oliver Springs	2
Mud Creek Springs	1
Hogwallow Springs	2
Webb Creek Springs	1
Barn Springs	2
Knox Spring	2
Total	12

March 2019 Update: Some of these springs were re-assessed as part of the hydrology/water quality study at the Refuge conducted by the Service in 2002 and 2003. The flow estimates were confirmed based on that study. Note that the total inflow from all these springs is only 12 cfs and flows are fairly constant so any errors in these measurements will be fairly inconsequential compared to the major inflow sources. Through this update to the measurement plan, we have become aware that we have not been including this inflow as part of the total inflow to the Blitzen Valley in our reporting. We will correct this in the 2018 report.

The output component of eq. 2 is represented by the gaged outflow of the USFWS Site No 357005 Blitzen River below Sodhouse Dam, and estimates of ungagged outflows. The existing stream gaging station was built and operated by the USGS until the 1979 flood. Since then, the Service has installed a Stevens data logger at the site, and is in the process of developing a rating for the channel. During low flow conditions, all surface water leaving the Blitzen Valley system passes this site. This will be the only continuously gaged outflow from the Blitzen Valley in the water budget.

March 2019 Update: The Stevens data logger mentioned above has been replaced with Sutron water monitoring equipment. The rating curve has been developed and is maintained by the Service. Flow and water temperature are monitored continuously at this site.

During the snow melt period, a small proportion of the total flow is allowed to leave Refuge lands via the Rieneman and Sodhouse ditch systems, and at the diversion to the Dunn in-holding. Given the intermittent nature of these flows, the installation of permanent water measuring devices is not recommended or feasible. Instead, spot measurements or visual observations are sufficient to estimate additional outflow. Although this may lead to error in the outflow component of the water budget, it is important to remember this analysis is concerned with measuring water use, i.e. the difference between inflow and outflow. Since ungaged volumes that leave the Refuge are very small compared to the total inflow, error in reported water use resulting from error of estimates of ungaged outflow will be small.

March 2019 Update: According the Refuge staff, there are three additional ways water leaves the Refuge on the North end of the Blitzen Valley, besides the main outflow in the Blitzen River (USFWS Site No 357005 Blitzen River below Sodhouse Dam). These additional outflows are described below and are depicted in Figure 2.

Stubblefield Canal – this canal originates from Busse Dam. This canal eventually connects to an old river meander channel that will exit the Refuge. The meander channel is full of vegetation and flat and when water is present it is difficult to tell if it is moving. Water would only exit the Refuge and enter Taylor property in very wet years.

Reineman Ditch – originates at Dunn Dam, which is small diversion. Where the ditch leaves the Refuge it is very flat and water seldom makes it this far. Water would only exit the Refuge and enter Taylor property in very wet years.

Bull Ditch – originates from Sodhouse Ditch, diverted at Sodhouse Dam. The water that leaves the Refuge through this ditch is water that is delivered for irrigation to two adjacent private landowners (Dunbar and Blackburn) per their irrigation water rights. The timing and amount of diversion is coordinated cooperatively between the two private landowners and the Service. These diversions represent water that leaves the Refuge to the north, although most of it is used consumptively for irrigation and does not return to the river or reach the lake. This diversion is not currently monitored separately and these diversions are by default, included in the total use estimates (inflow-outflow) for the Blitzen Valley since this additional outflow is not measured or accounted for. The Service could develop estimates of the diversion at this site if OWRD believe this is necessary.

Discharge data from each gaging station are initially expressed as flow rates. For the purposes of the water budget, flow rates will be expressed as monthly volumes. As described above, the term Δ S/Δ t in eq. 2 can be replaced with the term UR, which includes ET. Equation 2 has been rewritten to represent monthly water use volume by the Refuge.

$$U_R = [\sum I + I_M + I_S] - [O_1 + O_2] \qquad \textbf{(eq. 3)}$$

Where U_R is net monthly water use volume, $\sum I$ is the sum of all gaged monthly inflow volumes, I_M is the estimated monthly inflow volume from Mud Creek, I_S is the estimated monthly volume of water from springs (assumed to be constant), O_1 is the gaged monthly outflow volume near Sodhouse dam, and O_2 is estimated monthly volumes that flow off Refuge property (via the Reineman and Sodhouse ditches, and water used to irrigate lands on the Dunn properties in Section 15, Township 27S, Range 31E).

The term U_R includes return flow (water returned to the Blitzen after use) and is therefore ***net*** water use (this is referred to as "depletion" in the 1931 State Engineer's report), not the gross diversion rate as specified in Division 85 of the Oregon Administrative Rules. Based on Refuge observations, return flows are small in comparison to the diverted volume. The only significant non-Refuge diversions between the inflow gages I and the outflow gage (O_1) are at Dunn and Sodhouse dams. These diversions are at the lower end of the valley and benefit from any return flows entering the Blitzen upstream of the dams. Since the intent of water use reporting is (at least in part) to provide information on water availability, the approach outlined above is the most appropriate.

Potential sources for error include the estimates of spring flow, neglected ground water inflow/outflow, the Mud Creek contribution, and the estimate of ungaged outflow. Preliminary discharge data during low flow conditions suggests ungaged inflows account for about 21% of the total inflow (Table 2). During the snow melt season, relative error from ungaged sources will be considerably less.

March 2019 Update: Table 2 consisted of data from 1995 that was outdated and so the table was revised to reflect more current information from 2014-2017 on total inflow, outflow and net use by source. Note that not all the inflow reported in the table is diverted, a portion of it simply flows through the Refuge. Also note that net use may not reflect total use since we may divert additional water that ends up being returned to the river and is not used consumptively.

March 2019 Update: Another potential error that the Service has become aware of through the 20+ years of monitoring is that the water budget approach of estimating water use from the difference of inflows and outflows does not account for precipitation and runoff generated on the refuge lands themselves. This may represent a significant contribution to total inflow, especially in wet years. We have noticed that in the wetter months of some years, like 2014, 2015, and 2017, the calculation of inflow-outflow becomes negative, as shown in Table 2 below. The Service has reported zero use during these months in its annual water use reports for OWRD. This error is probably more substantial than other errors associated with ungaged flows. However, monitoring precipitation on the refuge and the subsequent runoff to the ditches/canals and the river and separating this inflow contribution from diversions would be challenging. The effect of this error is to underestimate the total inflow to the Refuge, which results in an underestimate of water use as calculated from inflow minus outflow.

During the irrigation season, monthly flow volumes will be compiled and the combined monthly net water use volume for the irrigation water rights identified above will be calculated using eq. 3. The results will be the basis for our water use report for these water rights.

During the non-irrigation season, especially when there is significant early run off, water is diverted out of the Donner und Blitzen river and tributaries and used to fill ponds. To quantify this water use, the same methodologies described above for irrigation use under Certificates 28524, 15217, and 14367 will be used. Prior to the start of the irrigation season on March 15, the net monthly water use for the ponds will be calculated. Since it is not possible to single out individual ponds, the total quantity calculated will be reported as a measure of the combined pond use.

March 2019 Update: Since the approval of Permit 54164 in 2005, water can be diverted outside of the irrigation season from the Blitzen river and tributaries for more than just filling ponds. Permit 54164 is for the general purpose of wildlife refuge management. The net use of water during this time for ponds and all other uses is estimated and reported to OWRD, as described above.

March 2019 Update: Table 2 was outdated and has been replaced with this information. Total Monthly and Annual Inflow, Outflow, Net Use, and Reported Use at Malheur NWR for Water Years 2014, 2015, 2016, and 2017.

WY 2017 Inflow and Outflow at Malheur NWR in ac*ft

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Blitzen blw Page Springs	2780	2583	2460	2373	6056	12007	14950	23665	16657	4990	2941	2785	94248
Bridge Creek	1059	1057	772	721	836	1315	2010	1270	845	872	864	835	12455
McCoy Creek	730	624	639	760	1701	2680	2730	4700	3130	584	391	232	18901
Krumbo Outlet	228	60	25	21	20	260	460	501	450	105	28	67	2224
Total inflow	**4796**	**4325**	**3896**	**3875**	**8612**	**16262**	**20150**	**30136**	**21082**	**6551**	**4225**	**3918**	**127829**
Total outflow Blitzen blw Sodhouse	**3192**	**2932**	**4610**	**11342**	**13603**	**12872**	**16339**	**17802**	**12559**	**3410**	**3317**	**2879**	**104855**
Use (Inflow-Outflow)	1605	1394	-714	-7467	-4990	3390	3811	12334	8524	3141	908	1039	22974
Reported Use	**1605**	**1394**	**0**	**0**	**0**	**3390**	**3811**	**12334**	**8524**	**3141**	**908**	**1039**	**36145**

WY 2016 Inflow and Outflow at Malheur NWR in ac*ft

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Blitzen blw Page Springs	2366	2428	3122	5337	8129	9249	12419	21498	11327	4298	2783	2591	85547
Bridge Creek	550	582	656	692	677	777	747	962	662	724	750	791	8570
McCoy Creek	604	720	1132	1455	1629	1895	2863	6834	1987	242	254	239	19854
Krumbo Outlet	85	79	78	72	66	78	92	105	93	94	26	153	1020
Total inflow	**3605**	**3809**	**4988**	**7556**	**10501**	**11999**	**16121**	**29399**	**14069**	**5358**	**3813**	**3774**	**114991**
Total outflow Blitzen blw Sodhouse	**2247**	**2747**	**4467**	**7502**	**8213**	**5085**	**3607**	**14148**	**4497**	**1168**	**1709**	**2214**	**57605**
Use (Inflow-Outflow)	1357	1062	521	54	2288	6914	12514	15251	9572	4190	2104	1560	57387
Reported Use	**1357**	**1062**	**521**	**54**	**2288**	**6914**	**12514**	**15251**	**9572**	**4190**	**2104**	**1560**	**57387**

WY 2015 Inflow and Outflow at Malheur NWR in ac*ft

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Blitzen blw Page Springs	2372	2449	4153	4659	4793	4752	6440	16912	7229	3059	2098	2137	61053
Bridge Creek	723	675	637	614	555	614	596	906	695	583	550	535	7683
McCoy Creek	387	798	1575	1800	1843	1851	2368	5138	2467	1119	686	326	20358
Krumbo Outlet	43	34	29	29	30	29	26	225	348	40	13	46	892
Total inflow	**3525**	**3956**	**6394**	**7102**	**7221**	**7246**	**9430**	**23181**	**10739**	**4801**	**3347**	**3044**	**89986**
Total outflow Blitzen blw Sodhouse	**2421**	**3363**	**5429**	**8147**	**5084**	**1544**	**1864**	**8478**	**3425**	**1189**	**1764**	**1904**	**44612**
Use (Inflow-Outflow)	1104	593	965	-1045	2137	5702	7566	14703	7314	3612	1583	1140	45374
Reported Use	**1104**	**593**	**965**	**0**	**2137**	**5702**	**7566**	**14703**	**7314**	**3612**	**1583**	**1140**	**46419**

WY 2014 Inflow and Outflow at Malheur NWR in ac*ft

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Blitzen blw Page Springs	2661	2582	2952	2696	5053	8720	9125	14904	7889	3259	2393	2187	64421
Bridge Creek	763	756	718	643	746	785	828	686	691	736	723	690	8765
McCoy Creek	371	391	825	1186	1636	1987	1883	1970	1757	1869	347	180	14402
Krumbo Outlet	184	179	182	77	44	367	180	24	366	83	25	38	1749
Total inflow	**3979**	**3908**	**4677**	**4602**	**7479**	**11859**	**12016**	**17584**	**10703**	**5947**	**3488**	**3095**	**89337**
Total outflow Blitzen blw Sodhouse	**4061**	**3842**	**4871**	**5506**	**7112**	**5299**	**985**	**4309**	**1256**	**787**	**1350**	**1619**	**40997**
Use (Inflow-Outflow)	-82	66	-194	-904	367	6560	11031	13275	9447	5160	2138	1476	48340
Reported Use	**0**	**66**	**0**	**0**	**367**	**6560**	**11031**	**13275**	**9447**	**5160**	**2138**	**1476**	**49520**

Sodhouse Spring

Water Right: Certificate 7343, Certificate 70427

Method of Measurement

Sodhouse Spring is located approximately 500 ft north of Refuge headquarters. Water is used to fill Sodhouse Spring pond, which provides an excellent wildlife viewing area for Refuge visitors. Water from Sodhouse Spring pond passes over an existing flashboard riser structure and empties into the Blitzen river. The Service holds certificate 7343 which allows the use of 15 cfs from Sodhouse spring for the maintenance of Malheur Lake. The Service also has "Ponds Bill" certificate 70427 for 24 acre-feet of storage at Sodhouse Spring pond.

The most practical method of measuring water use from Certificate 7343 is to improve the existing flashboard riser structure such that it can be used as a weir. This would require the following improvements:

Move the existing fish screen that covers the opening of the riser.

The inspection and replacement (if necessary) of flashboards.

The installation of a staff gage to measure water surface elevation.

The establishment of a reference mark on the riser relative to the staff gage. This will allow crest elevation to be determined easily regardless of the addition or removal of flashboards.

The staff gage at Sodhouse Spring Pond pond will be read by Refuge staff every three days as the Division 85 rules stipulate. Alternatively, a data logger could be installed at his location. Stage data would then be expressed in terms of discharge by the weir equation in the form of:

$$q = CLHu$$

where q is the discharge in cfs, L is the crest length in feet, H is the head above the crest in feet and C is the weir coefficient for a suppressed sharp-crested weir. Discharge data will be expressed in terms of volume.

The stage data collected will also provide the water use quantification for Certificate 70427, Division 85 rules require the reporting of reservoir contents for storage water rights on or about the same day of each month. Since this pond is spring fed and is consistently full, it is anticipated that the range of stage fluctuation will be small. The surface area and capacity information collected for the "Ponds Bill" filing will be utilized to develop an estimated capacity curve to cover the anticipated range of stage fluctuations. Monthly reservoir contents will be reported from the stage data and capacity information.

March 2019 Update: The improvements proposed above were made, the pond was surveyed and a capacity curve was developed, and the staff gage and reference mark were installed to allow the flashboard riser structure to serve as a weir to measure outflow (USFWS Site No 357041). However, as of several years ago, Sodhouse Spring pond started drying up, apparently because the springflow supplying the pond had slowed or stopped completely. This may be in response to drought, although the spring pond did not recede or diminish at all during the extremely dry years of the early 1990s when Malheur Lake almost completely dried up. It also may be in response to groundwater pumping that began several years ago on private lands to the south of the springs. Currently there is no outflow from the pond and the Service just reports the reservoir contents (USFWS Site No 357039).

Krumbo Creek and Krumbo Reservoir

The Refuge uses water from Krumbo Creek for storage, irrigation, recreation, and maintenance of Krumbo Reservoir. Seven water rights have been issued by the state for water use in this area of the Refuge. Measuring water use for these rights can be achieved by quantifying the inflow and outflow of Krumbo Reservoir, and measuring its contents. The specific methods used for each water right are described below.

Water Right Certificate 28524, Permit 50750 (now Certificate 72335)

Method of Measurement

The above listed rights are maintenance rights for Krumbo Reservoir. Beneficial uses under Certificates 28524 and 72335 are the maintenance of the reservoir for wildlife habitat and public recreation, respectively. Maintenance of the reservoir requires water to be diverted from Krumbo Creek to replace evaporative and seepage losses from the reservoir. The quantity of water used for maintaining levels in the reservoir can be obtained from measurements of inflow.

A gaging station located approximately 3 miles upstream of Krumbo Reservoir was installed in 1991, and consists of a data logger that records water surface elevation in a controlled reach of Krumbo Creek. Data are transmitted to the Bureau of Reclamation office in Boise, Idaho. Discreet values of water surface elevation, and mean daily values are achieved in a data base. These data are accessible through telephone modem. A rating for the channel is presently being developed by Service staff and the Harney County Watermaster.

The point of diversion for these water rights is located at Krumbo Dam. Although Division 85 rules state water should be measured at the point of diversion, it is more practical to quantify the of maintenance water right before it enters the reservoir. It is proposed that the Service use data from the previously mentioned gaging station located approximately 3 miles upstream of Krumbo Reservoir. To fully comply with Division 85 rules, the Service intends to conduct seepage runs to determine if there are any losses or gains in flow in the reach of Krumbo Creek between the gage and the reservoir.

March 2019 Update: Maintaining a gaging station on Krumbo Creek three miles upstream of the reservoir was the shared responsibility of the Service, OWRD and the neighboring landowners. It turned out not to be feasible and this site was abandoned shortly after it installed. There are no other feasible monitoring sites between this site and the reservoir. For annual water use reporting, the Service has not been monitoring and reporting reservoir inflow and has only been reporting the change in storage in the reservoir (USFWS Site No 357011) and the reservoir outflow (USFWS Site No 357009) on a monthly basis, as described below. This measurement accounts for any water diverted for storage in the reservoir or irrigation use downstream of the reservoir but doesn't account for evaporation losses from the reservoir.

Water Right Certificate 33824, Permit R-11162 (now Certificate 72334)

Method of Measurement

Certificate 33824 allows storage of 1660 acre-ft of water per year in Krumbo reservoir to be used as supplemental irrigation under Certificate 33825 (see below). Certificate 72334 allows storage of an additional 838 acre-ft of water to be used for recreation. During the storage season, water is diverted from Krumbo Creek for storage. Per Division 85 rules, measuring water use for a storage water right simply means measuring the contents of the reservoir on or about the same day each month.

The Service has recently resurveyed the bathymetry of Krumbo Reservoir and generated a new capacity curve for the reservoir. A staff gage is located in the drop structure of the dam. To determine the water surface elevation of the reservoir, the outlet pipe will be shut to prevent any drawdown error and the staff gage will be read. Refuge staff will be responsible for recording the staff gage reading on or about the 15th day of each month. The reservoir elevation data will be converted to storage volume for purposes of water use reporting.

Water Right: Certificates 33825, 70414 (now 75157), 70424 (now 80453)

Method of Measurement

Certificate 33825 allows the supplemental irrigation of 640 acres of lands downstream of Krumbo Reservoir. Typically water is released for two to three months of the year. The POD for this water right is the dam, and water use can be measured at the outlet.

Certificates 75157 and 80453 are "Ponds Bill" certificates which cover a combined 78 acre-feet of storage in Krumbo Pond and Krumbo Swamp. Water to fill these ponds is passed through Krumbo Dam and can also be measured at the outlet.

Outflow from Krumbo Reservoir is discharged into Krumbo Creek through a 30 inch diameter pipe. The flow rate is regulated by a screw-gate located in the drop structure. Presently, no measuring device exists at this location; however, there are plans to have one installed. The device under consideration, a Flo-tote Model 260 made by Marsh-McBirney Inc., will measure discharge through the outlet pipe. This device is able to measure and record discharge in partially filled pipes. A sensor will be installed in the outlet pipe, and values of velocity and depth will be used to calculate discharge at user-specified intervals. Data will be retrieved as needed for water use reporting requirements.

During the irrigation season monthly discharge volumes will be determined and reported as use under Certificate 33825. During the non-irrigation season, monthly flow volumes will be reported for the combined storage of certificates 75157 and 80453.

March 2019 Update: The outflow from Krumbo reservoir is measured downstream in the outlet channel with a Parshall flume that was installed in 1997 by the Service and USBOR (USFWS Site No 357009 Krumbo Cr Flume blw Krumbo Reservoir). Data are recorded continuously at the site.

Water Rights In and Around Malheur Lake
Certificates: 15194, 15195, 15197*, 15200, 15203, 15204, 15206, 15208, 15212, 15213, 15214, 15218, 15219, 15224, 15231, 15232, and 29007**

The Refuge holds 15 water rights sourced from the Donner und Blitzen river water for irrigation of lands around the perimeter of Malheur Lake. The source of water for Certificate 29007 is given as Malheur Lake. Four (4) of these rights list a particular ditch or ditches which supply water to the place of use. The remaining 12 do not have a point of diversion but are irrigated by "natural overflow". The ditches associated with water right certificates 15197, 15208, 15231, and 29007 were destroyed during the floods of the l980's. The associated land continues to benefit from Donner und Blitzen River water, but now it is through "natural overflow" like the other 12 water rights. The place of use for all 16 water rights is in the area described in the 1931 State Engineer's report as lying between the Meander of1877 and the water surface of Malheur Lake. The available water supply for these lands was quantified at the Voltage Station (McAllister, 1931). This station was just downstream of our current measuring site below Sodhouse Dam but no longer exists. The Refuge also has a 200 cfs water right (Certificate 15232) for the use of Donner und Blitzen River water for the maintenance of Malheur Lake. This right is for year around use and lists "natural overflow" as the point of diversion.

*140 acres of the place of use for this water right is not owned by the Refuge.
** Lists Malheur Lake as the source, but receives water in the same manner as the Donner und Blitzen decreed rights.

Method of Measurement
The low gradient of the river below Sodhouse Dam and the "Natural Overflow" diversions do not allow the measurement of water use associated with each individual water right. However, the Sodhouse gage can be used to measure them collectively. During the irrigation season the reported monthly volumes will include water used under all of the above mentioned water rights. During the non-irrigation season, the monthly volumes reported will be for water used under Certificate 15232 only.

March 2019 Update: OWRD has not required the Service to report on any of these rights with the exception of Certificate 15232. We have been reporting on this water right using the streamflow data from the site that we maintain below Sodhouse Dam (USFWS Site No 357005 Blitzen River below Sodhouse Dam).

Silver Creek

Certificates 14052 and 14041

Water is used under these rights for irrigation on the Double O area of the Refuge (Figure 1). Silver Creek enters the Refuge from the north and after crossing the Double O area it empties into Harney Lake. The head waters of Silver Creek are located a significant distance to the north and there are numerous diversions upstream of the Refuge. Today flows rarely reach Harney Lake due to upstream diversion. North of the Refuge boundary, the Silver Creek channel has been blocked by a series of low level dams and dikes in an effort by upstream diverters to spread the water out to irrigate their pasture and hay fields. These obstructions along with the low gradient in the area cause water to enter the Refuge through a series of poorly defined channels (Figure 3). During the runoff season, much of the Refuge irrigation is the result of overland flow. Less frequently, water collects in the Refuge ditch system and is distributed for irrigation. The water right certificates and the Decree do not list a point of diversion other than Silver Creek and tributaries.

For these reasons measuring water use for these water rights is difficult. There appears to be few measuring options, since it is difficult to predict when and where Silver Creek water will enter the Refuge. When it does, it is through numerous poorly defined channels which do not provide adequate measuring opportunities. A method of estimation is described below.

Irrigation begins at the north end of the Refuge where the Silver Creek channels cross the Refuge boundary. Irrigation progresses in a southeasterly direction. Depending on the volume of runoff and amount of upstream diversions, all or some portion of the acres identified in these certificates are irrigated. If the areal extent and timing of irrigation on the Refuge is known, it would then be possible to estimate the volume of water used monthly. Although this is not a direct measurement of a quantity of water used, it may provide a reasonable estimate for the purposes of water use reporting. Refuge staff will provide the estimate of the area and duration of irrigation, and the Regional Office will estimate monthly volumes of water use for reporting to OWRD.

March 2019 Update: The Service is not currently measuring Silver Creek and has not been required by OWRD to report on these two rights.

Malheur National Wildlife Refuge
Silver Creek Area Map

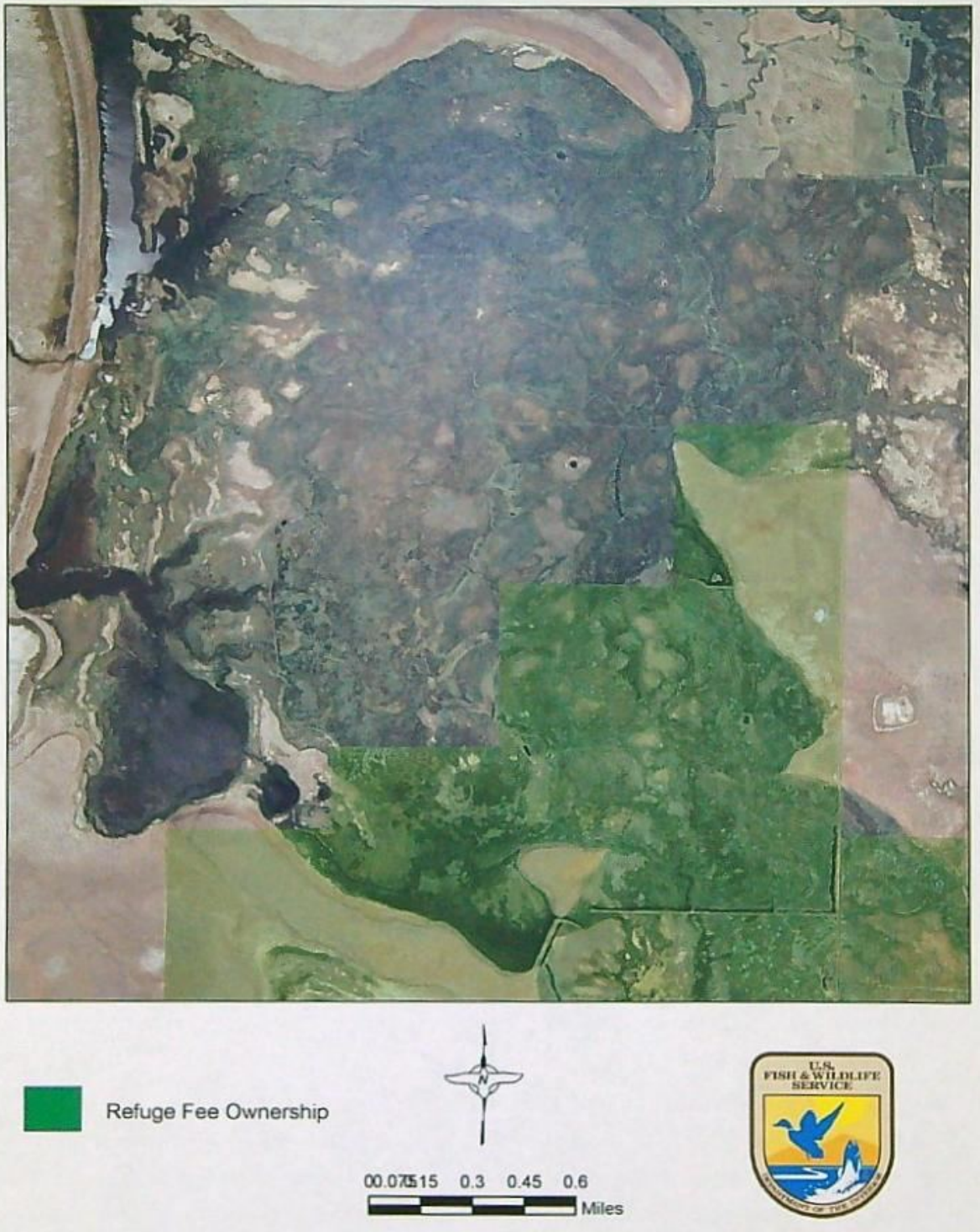


Figure 3. Aerial Photo of the Silver Creek area of Malheur National Wildlife Refuge.

Double O Area "Ponds Bill" Certificates

70408, 70419, 70420, 70421, 70426, 70428, 70429, 70440, 70441, 70452, 70453, 70454, 70455, 70456, 70457.

The Service holds 15 "Ponds Bill" certificates for ponds in the Double O area of the Refuge. These ponds receive water from a variety of sources including Silver Creek, Warm Creek and Double O Springs. Applications were filed for these ponds based on the estimated maximum capacity of the pond. Detailed topographic surveys were not done and stage/capacity data is not currently available.

Unlike the ponds in the Donner Und Blitzen Valley there are no alternative means of estimating water use in these ponds. Therefore, the Service will conduct bathymetric surveys, develop stage/capacity tables and install staff gages at each of these ponds. It is anticipated that this effort will take several years to complete.

Once this work is completed Refuge staff will measure and record water surface elevations for each pond monthly. Elevation data will then be converted to monthly volumes of storage which will be reported to OWRD.

March 2019 Update: The Service has completed all bathymetric surveys of the ponds and monitors water levels in these ponds monthly, as required. The data are reported annually to OWRD.

Double O Area Springs

Permit S-54969

March 2019 Update: In 2013, the Service filed a water right application (S-87945) for springflow at six springs in the Double O area of the Refuge. The six springs are Harney Lake Spring Area, Hibbard aka Double O Spring, Double O Cold Spring, Barnyard Spring, Basque Spring, and Stinking Lake Spring. All six of these springs emerge on Refuge property and do not exit it so legally the Service is not required to have a water right for them under Oregon state law. The Service filed the application because of the threat from increased groundwater development on the surrounding private lands in the area. The main purpose in filing the water rights was to protect the springflow from future groundwater pumping. The Service maintains that it may have a federal reserved water right for these springs as well, with an earlier priority date.

Permit 54969 was issued for the springs by OWRD in 2016. In issuing the permit, OWRD determined that water was not available in April and May, although the springs flow at a fairly constant rate all year and there is no means of not diverting the spring outflow. The Service is required to monitor all the PODs for the springs per Permit 54969, which includes the standard language for monitoring.

As with many of the sites at Malheur NWR, there are challenges in monitoring the springflow. The outflows are low velocity and the elevation gradients are low. Installing some kind of measurement structure like a weir, flume, or gate at the spring outflow could back up the water in the springpool, causing a higher static head in the springpool and a reduced outflow. Furthermore, the outflow is diffuse and non-channelized at two of the springs (Harney Lake Spring Area and Double O Cold Spring) and one spring is submerged by a lake except at low water levels (Stinking Lake Spring). As noted, since none of the spring outflow leaves the Refuge, there is no possibility that diverting this water will cause injury to another water right off the Refuge.

For these reasons, the Service is proposing an alternative method of measurement and reporting for this permit as well. The Service proposes to measure the outflow from three of the springs where it is feasible to do so: Double O, Barnyard Spring, and Basque Spring. We have established monitoring sites at these three springs and are investigating methods of measurement (gate equations, culvert equations, Manning's). These three spring would serve as sentinel sites for all of the springs. We would assume that if springflows are protected and maintained at these springs, they will be protected and maintained elsewhere in the area as well. We request that this alternative method be documented and approved as part of this updated measurement plan.

References

Lystrom, David 1970, Evaluation ofthe Steamflow-Data Program in Oregon: U.S. Department of the Interior, Geological Survey, Water Resources Division Open file Report, 28 p.

McAllister, L.A. 1931, Report ofWater Supply, Use, and Duty ofWater ofDonner Und Blitzen River and its Tributaries, Hamey County, Oregon. Made in Connection with the Adjudication of Water Rights under the Direction of Chas. E. Stricklin, State Engineer, 44 p.

Exhibit C

STATE OF OREGON

BEFORE THE OREGON

WATER RESOURCES COMMISSION

In the Matter of Water Right Application S 84222 in the Name of the United States Fish and Wildlife Service *Applicant*	) FINAL ORDER INCORPORATING SETTLEMENT AGREEMENT, DENYING PROTESTS AND APPROVING APPLICATION S 84222
Harney County *Protestant*	)
Harney County Soil & Water Conservation District *Protestant*	)
Water for Life, Inc. *Protestant*	)
WaterWatch of Oregon *Protestant*	)
Oregon Department of Fish & Wildlife *Intervenor*	)

I. HISTORY OF THE CASE

On July 28, 1999, the United States Fish & Wildlife Service ("USFWS") filed application S 84222 with the Oregon Water Resources Department ("OWRD" or "Department"), proposing to divert up to 820.4 cubic foot per second ("cfs") from the Donner und Blitzen River and tributaries for use in wildlife refuge management. Protests to the application were timely filed by protestants Harney County, Harney County Soil & Water Conservation District ("HSWCD"), Water for Life (representing Water for Life, Harney County Haygrowers Association, Dwight Hammond and Susan Hammond, Andy and Vena Dunbar and the Harney County Haygrowers Association) (hereinafter referred to collectively as "Water for Life" or "WFL")[1] and WaterWatch of Oregon. The Oregon

[1] ORS 537.170 provides that any person may submit a protest against a proposed final order. The statute also provides that a person may represent the public interest provided that public interest is precisely articulated. Further, a protest must be accompanied by the protest fee described in ORS 536.050. Water for Life filed one protest and one protest fee and articulated that it as an organization was representing the public interest of its constituents Hammond Ranches, Inc., Andy and Vena Dunbar dba Open AT Ranch, and Harney County Haygrowers Association. Therefore, Water for Life only is the protestant and party to this matter.

Department of Fish & Wildlife ("ODFW") filed a request for standing, and was later granted status as an intervenor.

The OWRD referred this matter to the Office of Administrative Hearings for a contested case hearing. On September 27, 2000, a prehearing conference was held. An Order on Prehearing Conference was issued on October 13, 2000, providing a schedule for further proceedings in this matter, identifying the issues presented in this case, and identifying those issues, among those presented, that were appropriate for determination through a motion for ruling on legal issues. A Supplemental Order on Prehearing Conference was issued on December 1, 2000, modifying the schedule of proceedings and amending the issues presented to include issues B.15., E and F, as stated in the Statement of Issues, below. The March 30, 2001, Supplemental Order further amended the schedule of proceedings, and the issues presented for hearing were amended to those stated in the Statement of Issues, below, by Order Revising Schedule and Issues for hearing on April 25, 2001.

On November 11, 2001, an Order for Ruling on Legal Issues was issued, determining as a matter of law, Issues B.2., B.3., B.8., B.12., B.14., C., D., E. and F., as stated in the Statement of Issues below. The Conclusions of Law, below, reflect the determinations made in that order.

Written direct and rebuttal testimony, together with accompanying exhibits, were filed pursuant to an Order Revising Schedule dated November 27, 2001.

On February 21, 2002, a Settlement Agreement was entered into by the ODFW, OWRD, USFWS, and WaterWatch of Oregon, whereby the OWRD agreed to modify the conditions in the proposed and final order as identified below, and WaterWatch of Oregon withdrew from its protest issues B.1., B.4., B.7., B.9. and B.13. The result of this stipulation is reflected in the Conclusions of Law regarding these designated issues below.

On April 29, 2002, a Stipulation was entered into between the USFWS and OWRD whereby it was agreed that any permit issued on the application subject to this case would include a specified general condition relating to livestock watering from a stream, as identified below. This stipulation was received into the record and is reflected in Conclusion of Law B.4., below.

A contested case hearing was held in this matter at the Harney County Courthouse, Burns, Oregon, on April 30, 2002, for the purpose of cross-examining those witnesses who had submitted written direct and rebuttal testimony, and whose cross-examination had been requested as provided in the Order Revising Schedule. Administrative Law Judge ("ALJ") Paul Vincent presided. The applicant USFWS appeared through and with its attorney, Barbara Scott-Brier. The OWRD appeared through and with Assistant Attorney General Sharyl Kammerzell, assisted by agency representative, Renee Moulun. The ODFW appeared through and with Assistant Attorney General Shelley McIntyre. Protestant Water for Life, including Dwight and

Susan Hammond, Andy and Vena Dunbar, and the Harney County Haygrowers Association, appeared through and with its attorney Brad Harper. Protestant Harney County appeared through its attorney Ron Yockim. Protestant Harney County Soil & Water Conservation District appeared through its attorney Joe Hobson. Protestant WaterWatch of Oregon appeared through its attorney Karen Russell.

Witnesses Dwight French, Rick Cooper and Mitch Lewis testified on behalf of the OWRD. Witnesses David Stanbrough, Dr. Bernie Weddell, Margaret Law, Richard Roy, Douglas Young, Kevin Sittauer, Michael L. Taylor, Michael Eberle, and John Haapala testified on behalf of the USFWS. Witnesses Susan Hammond, Richard Jennings and Jack McCallister testified on behalf of the HSWCD. Witnesses Wayne Bowers, Mitch Lewis, State Senator Ted Ferrioli, Stacey Davies, and Gary Marshall testified on behalf of Water for Life. Water for Life requested cross-examination of Wayne Bowers at hearing, but this request was denied because Bowers was Water for Life's own witness for direct testimony. WFL's request to cross-examine Mitch Lewis was allowed, to the extent this witness submitted direct testimony on behalf of OWRD. The record closed on May 14, 2002.

On October 27, 2003, the ALJ issued a Proposed Order recommending approval of application S 84222 with conditions.

On November 14, 2003, Harney County filed its Exceptions to the Proposed Order. On November 17, 2003, Water for Life filed its Exceptions to the Proposed Order. On November 26, 2003, applicant USFWS and WaterWatch of Oregon filed responses to the exceptions.

On March 11, 2004, Harney County and Water for Life argued their exceptions before the Water Resources Commission ("WRC"). USFWS and WaterWatch made oral arguments responding to the exceptions. Subsequently, the WRC appointed a subcommittee of two Commission members to review the contested case record and report back to the WRC. The WRC also urged the parties to further pursue settlement discussions, and continued the matter until the October 2004, WRC meeting.

At its October 22, 2004, meeting, the WRC received a status report from staff on the matter. Subsequent to this report, the WRC directed the subcommittee to complete review of the hearing record by the January, 2005 meeting. The WRC also once again urged the parties to pursue settlement. . The WRC tabled the matter to its January, 2005 meeting.

Prior to the WRC's January 2005 meeting, USFWS, Harney County and OWRD entered into a Settlement Agreement which is incorporated herein by reference. The Settlement Agreement modifies Application S 84222 and results in Harney County withdrawing its exceptions to the ALJ's Proposed Order. Terms of the Settlement Agreement modifying Application S 84222 are reflected in this final order.

The record of this proceeding, consisting of audiotapes from the cross-examination hearing, all evidence received, and all motions and exceptions filed, has been considered. The findings of fact and conclusions of law are based upon the entire contested case record.

II. STATEMENT OF ISSUES

Pursuant to ORS 537.170, "the issues to be considered in the contested case hearing shall be limited to issues identified by the [administrative law judge]." The issues in this matter were established by the ALJ through an April 25, 2001, Order Revising Schedule and Issues for Hearing, identifying the following issues to be resolved at hearing, and specifying issues B.2., B.3., B.8., B.12., B.14., C., D., E., and F as legal matters to be decided after written argument prior to hearing. The party who raised each issue is identified in parentheses below.

Considering the matters listed below, whether the proposed use under application S 84222 will impair or be detrimental to the public interest.

A. Water Availability

1. Whether water is available for the proposed use. (Water for Life; Harney County)

2. Whether the U.S. Fish & Wildlife Service's use of this water for the Malheur Refuge is a high public interest value use. (Harney County; Water for Life)

B. Public Interest

1. Whether the proposed use, as conditioned, adequately protects flows for redband trout and other aquatic resources. (WaterWatch of Oregon; ODFW)

2. Whether the proposed use, as conditioned, creates an unlawful instream water right. (Water for Life; Harney County)

3. Whether the proposed use will injure existing water rights. (Water for Life)

4. Whether the proposed use must be conditioned to allow for or to prohibit livestock watering from streams on land appurtenant to the proposed use. (WaterWatch of Oregon; Harney County)

5. Whether the proposed permit provides adequate provisions for regulation and enforcement. (Harney County)

6. Whether the specific numerical rate limits given for each diversion point in the draft permit should be limited on the total quantity of water that may be diverted from each diversion point. (Harney County)

7. Whether the proposed use, as conditioned, adequately protects water quality. (WaterWatch of Oregon)

8. Whether the proposed use is compatible with Statewide Planning Goals and local comprehensive plans. (Harney County; Water for Life)

9. Whether the proposed use must be conditioned to prohibit a transfer of the type and place of use under the proposed permit to any non-fish or wildlife use off Refuge lands. (WaterWatch of Oregon)

10. Whether the proposed use, as conditioned, complies with OAR Chapter 690, Division 33. (WaterWatch of Oregon; Water for Life)

11. Whether the proposed use is consistent with the Malheur Lake Basin Program rules. (Harney County; Water for Life)

12. Whether the proposed use is a permissible beneficial use. (Water For Life)

13. Whether the proposed use must be further conditioned to limit future irrigation to irrigation necessary for wildlife needs. (WaterWatch of Oregon)

14. Whether OWRD has authority to condition the water rights as suggested in issues B.9 and B.13. (OWRD)

15. Whether the proposed use includes storage, and if so, whether storage is a permissible beneficial use under application S 84222. (Harney County)

C. Whether the proposed use must be consistent with the Donner und Blitzen decree and, if so, whether it is. (Harney County)

D. Whether the proposed use may be approved prior to the applicant entering into formal consultation and formal conference under the Endangered Species Act and performing a compatibility analysis under the National Wildlife Refuge Administration Act. (Water For Life)

E. Whether the approval of water right application S 84222 will result in a federal reserved water right. (HCSWCD)

F. Whether there is a non-use of current water rights, and if so, whether it should be required that acres subject to non-use be forfeited. (HCSWCD)

III. EVIDENTIARY RULINGS

1. USFWS objects to Exhibit A, offered by WFL, except for pages 16, 18, and 19, as irrelevant. This objection is joined by OWRD, ODFW, and WaterWatch of Oregon. The objection to Exhibit A is sustained as to all pages except for pages 2, 16, 18 and 19.

2. USFWS objects to Exhibit B, an Abstract of Votes on a Harney County initiative measure in regard to whether the Refuge should acquire land. The objection is sustained, since the proffered evidence is irrelevant.

3. USFWS objects to Exhibit C, a November 16, 1989 letter from the Water Resources Department Director William H. Young on relevance grounds. This objection was joined by OWRD, ODFW and WaterWatch of Oregon. The matter is relevant. The objection is overruled.

4. USFWS objects to Exhibit D on grounds that it lacks foundation and relevance. This objection is overruled.

5. USFWS, joined by OWRD and ODFW, objects to Exhibits E-1 through E-9, as inaccurate and unreliable. This objection goes to weight, not admissibility. This objection is overruled.

6. USFWS, WaterWatch of Oregon, ODFW and OWRD object to Exhibits E-10 through E-19 for lack of foundation and prejudice due to timeliness. This objection is overruled. The documents will be admitted as business records.

7. USFWS objects to Exhibit F on grounds of authenticity and relevance. The primary objection is to weight, not admissibility. This objection is overruled.

8. USFW objects to Exhibits G-17 through G-19 as not part of the document in the USFWS file. OWRD objects on the grounds that it is contained in OWRD Exhibit 1 at pg. 142 and therefore duplicative. In order to assure a compete record of evidence, this objection is overruled.

9. OWRD Exhibits 1 through 7 were admitted without objection.

10. Exhibits accompanying written direct testimony offered by HCSWCD were admitted over USFWS objections to legal argument contained therein and relevance. The objection goes to weight, not admissibility. Objection overruled.

11. Exhibits 2 through 4 offered by HCSWCD are admitted over objection to relevance.

12. Water for Life objected to the second document included in Rebuttal Testimony, entitled "revenue sharing agreement." The full document is found in Exhibit H. This document is excluded as unnecessarily duplicative.

13. Exhibits 1 through 52 offered by USFWS are admitted without objection.

14. OWRD moved to quash the subpoena for testimony by Paul Cleary, Director of the Water Resources Department at the time of the hearing. The motion was made on the grounds that Mr. Cleary was being called to testify in his role as an agency decision maker, as opposed to factual inquiry into relevant matters in dispute. *See Citizens to Preserve Overton Park v. Volpe*, 401 US 402, 422 S Ct 814, 28 L ED2d 136 (1971). The intended line of inquiry is relevant only to the decision making process of the witness. With no showing that the director's decision making process is properly in dispute, the subpoena was quashed.

IV. MOTIONS

At a prehearing conference, the parties identified those issues that were appropriate for resolution through written argument (briefing) prior to hearing. See OAR 137-003-0580. Those issues identified as appropriate for briefing were: B.2, B.3., B.8., B.12., B.14., C, D, E and F. Accordingly, on February 20, 2001, the OWRD, the USFWS, Water for Life, Harney County and WaterWatch of Oregon filed opening briefs. On April 16, 2001, the OWRD, USFWS, WaterWatch of Oregon, and Water for Life and Harney County filed response briefs. On May 7, 2001, the responding parties filed reply briefs. A Ruling on Legal Issues was issued by the ALJ on November 21, 2001. This order provided that Issues B.2, B.3, B.8, B.12, B.14, C, D and E, and F failed as a matter of law. An Order Revising Schedule subsequently set the dates for an evidentiary hearing on the remaining factual issues (A.1, A.2, B.1, B.4, B.5, B.6., B.7., B.9., B.10., B.11., B.13., and B.15.).

Order of Presentation is stated in OAR 690-002-0140 and was provided in the Notice of Hearing dated April 18, 2002.

Official notice was taken of the stipulation between ODFW, USFWS and OWRD. Water for Life objects to the background statements contained in the stipulation. This objection does not go to the evidentiary value of the stipulation. The objection is overruled.

Official notice was taken of the stipulation between OWRD and USFWS.

V. FINDINGS OF FACT

(1) Application S 84222 was filed by the USFWS on July 28, 1999, requesting a diversion for a water right in addition to its existing water rights. The proposed places of use for this right are listed at OWRD Exhibit 1, pages 17 through 49 and are hereby

adopted by reference.[2] The amount of water proposed for diversion is up to 820.4 cubic foot per second ("cfs") to be used between October 1 and March 15, each year, with a priority date of July 28, 1999, the water to be diverted from 12 different points of diversions. (OWRD Ex. 1 at 352.) Each diversion point has a specified capacity stated in the Proposed Final Order that, when added together, totals more than the cumulative amount of 820.4 cfs requested. (OWRD Ex. 1 at 352.) The Proposed Final Order allows use of the Donner und Blitzen River and its tributaries, a tributary of Malheur Lake, for Wildlife Refuge Management which may include wildlife use, aquatic life, wetland enhancement, riparian area enhancement, fire protection, irrigation use, stock watering, recreation use, construction, flood control, reservoir maintenance and dust control. (OWRD ex. 1 at 352.)

(2) The Malheur National Wildlife Refuge ("Refuge") is an immense area, covering over 180,000 acres. The Blitzen Valley portion covers over 65,000 acres. The management of water on the Refuge is very complex, and has always been so, even when it was a working ranch. The Refuge's water is managed to meet its primary purpose as a refuge and breeding ground for migratory waterfowl and other wildlife. The Refuge uses its water to provide habitat to migratory birds and other wildlife. The habitat includes grains, grasses, wetland plants (often called emergent vegetation) and small ponds. Some commercial crops are grown on the Refuge, but such plantings are integrated in the Refuge's biological planning. Wetland plants provide a number of benefits to waterfowl, including nesting, resting, feeding, and so forth. Ponds are also necessary for wildlife species that need some amount of open water. (OWRD Ex.1 pg 61 – 69.; Affidavit and Written Direct Testimony of David A. Stanbrough; USFWS Exhibits 1 & 2; Affidavit and Written Direct Testimony of Margaret S. Laws; Affidavit and Written Direct Testimony of Bertie Josephson-Weddell; USFWS Exhibits 25 & 26.)

(3) The Malheur National Wildlife Refuge is one of the oldest and most important migratory bird refuges in the national refuge system. It has long been recognized for its contribution as a major and essential feeding and resting location for Pacific flyway birds migrating between the northern breeding grounds and wintering areas to the south. It is also an important breeding ground for wetland and upland migratory birds. Use of water for the protection and management of wetland systems in the Refuge not only contributes to management for Refuge purposes but also contributes to the national and global significance of this important bird area. (Affidavit and Written Direct Testimony of David A. Stanbrough; USFWS Exhibits 1 & 2; Affidavit and Written Direct Testimony of Margaret S. Laws; Affidavit and Written Direct Testimony of Bertie Josephson-Weddell; USFWS Exhibits 25 & 26.)

(4) The proposed use will be a value to public recreation in that it is for the management of the Malheur National Wildlife Refuge. The Refuge was established by Executive Order of President Theodore Roosevelt in 1908 to protect its natural significance as a breeding ground for many species of water birds. The Refuges resources

[2] There are several hundred places of use for this right. The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Permit. *See* OWRD Exhibit 1 at pages 17 – 49.

include over 320 species of birds, 58 species of mammals, 10 species of native fish and a number of reptiles and amphibians. The Refuge is an important spring migrational staging area for a wide variety of birds including tundra swans, lesser snow geese, Ross's geese, tule white-fronted geese, and greater white-fronted geese from Alaska. In the early fall, up to 50% of the world's population of tule geese has been counted in the Harney basin. During fall migration, up to 500,000 ducks use the Refuge when wetland conditions are good. In addition, up to 12,000 lesser sandhill cranes (the largest breeding flock in California, Washington and Oregon) gather and breed in the basin each spring. (OWRD Ex. 1, pgs. 51 – 70; Affidavit and Written Direct Testimony of David A. Stanbrough; USFWS Exhibits 1 - 4)

(5) Wildlife viewing, and bird watching in particular, is the most popular recreation activity at the Refuge. From October 1999 through September 2000, there were 62,700 visitors to the Malheur National Wildlife Refuge. Of these visitors, 53,255 came primarily for the wildlife viewing opportunities provided by the Refuge. The majority of the visitors travel to the Refuge to view the spring and fall migrations of waterfowl as the primary focus of their trip. (Affidavit and Written Direct Testimony of Michael L. Taylor, PH.D.; USFWS Ex. 31, pg. 9.)

(6) Economic activity on the Refuge includes haying and rake-bunch-haying for which there are 22 Special Use Permits and two to three Cooperative Land Management Agreements as well as interagency/private interest Conservation Agreements. Together these total approximately 40,000 AUM's annually. Dismissing extreme conditions such as drought that impact hay prices, and using rates current as of 2002, the economic value of the Refuge's grazing and haying program is approximately $280,000 per year. (Affidavit and Written Direct Testimony of Kevin J. Sittauer; USFWS Ex. 28).

(7) Nonconsumptive recreational activities are estimated as being from $19 to $76 per visitor per day and $115 to $3,393 per acre. Estimates of the net economic value of waterfowl hunting range from $14 to $76.95 per day of hunting. The total annual value of recreation fishing at the Refuge is estimated at $356,560. Wildlife viewing, waterfowl hunting and recreational fishing combined are estimated as generating over $3.6 million in benefits each year. (Affidavit and Written Direct Testimony of Michael L. Taylor, PH.D; USFWS Ex. 31.)

(8) Water right staff at OWRD prepared a water availability analysis for this application at the 80% exceedence level and found that water was available October through March, but not in the amounts requested by the applicant. (Testimony of Dwight French; Testimony of Richard M. Cooper; OWRD Ex. 1 pgs 5 – 6; 116 – 126; 173 – 183; OWRD Ex. 2 pg. 1.)

(9) The Department considered ten factors to determine whether the public interest in the proposed use is "high." These factors were as follows: 1) whether the public use is necessary; 2) whether there are benefits from the proposed use (from a premise that the public interest is higher for a use benefiting the public); 3) the "positive" public impacts of obtaining a permit for the proposed use; 4) how the use will benefit water users; 5)

how the use will benefit the area of the use; 6) why the use is "important" to the area of use; 7) the environmental benefits of the proposed use; 8) whether there are other sources available for the proposed use and if so whether they can or cannot be used (why one source is more preferable to another source); 9) whether the proposed source is the "best" source; 10) the negative impacts or consequences of denying the proposed use. (Direct Testimony of Dwight French; OWRD Ex.1 pgs. 59 – 70, 330; 109 – 111.)

(10) The Malheur National Wildlife Refuge is a public refuge established for the purpose of providing a refuge and breeding ground for migratory birds and other wildlife. Water is necessary for the Refuge to function for the purposes for which it was designated because the wetlands and meadows that are habitat for bird species are preserved by the application of water which is diverted from a series of canals in order to mimic natural stream conditions and floodplain function. The proposed water right under application S 84222 would serve to allow Refuge management to capture early runoff and floodwaters outside the irrigation season of March 15th to October 1st to allow approximately 33,000 acres of meadow and marsh areas in the Refuge to be watered by early March. (Affidavit and Written Direct Testimony of David A. Stanbrough)

(11) This water right is necessary to support the purpose and operation of the Malheur National Wildlife Refuge in the amounts requested during the season requested. (Affidavit and Written Direct Testimony of David A. Stanbrough; Affidavit and Written Direct Testimony of Margaret S. Laws; Affidavit and Written Direct Testimony of Bertie Jsephson Weddell).

(12) The use will benefit water users in the area because early diversion of floodwaters and spring runoff could reduce flooding problems on adjacent lands (Direct Testimony of Dwight French; OWRD Ex. 1 pgs. 59 – 70; Affidavit and Written Testimony of David A. Stanbrough; USFWS Ex. 5).

(13) Open AT Ranch, owned by Andy and Vena Dunbar, own grazing land appurtenant to the Refuge, and have expressed concern regarding the management of floodwater by the Refuge and the effect of the proposed diversion on groundwater. (Protest of Water for Life at 4.)

(14) The water rights presently held by Hammond Ranch are upstream from all diversion points proposed and senior to the proposed use. (OWRD Ex. 1 at 135.)

(15) The Malheur National Wildlife Refuge has been actively attempting to control weed spread for decades and has used methods including ground and aerial application of herbicides, release of biological controls, grazing, disking, mowing, and prescribed burns. The Refuge is specifically addressing pepper weed control and based on studies has determined that removing Refuge water or quarantining Refuge hay will not stop the spread of weeds since these are not the only ways that seed is spread and since the Refuge is not the only area with pepper weed. (Written Rebuttal Testimony of Margaret E. Laws; USFWS Exhibit 46).

(16) Mitch Lewis works for the OWRD, in the Field Services Division. At the time of the contested case hearing he was the watermaster for District 10, which includes all of the Malheur-Wright Basin and a portion of the Malheur River Basin. In this role he performed an injury review of the application and concluded that the proposed use will not injure existing water rights. (Dir. Test. Mitch Lewis at 1 – 2; OWRD Ex. 1 pgs. 314; 342.)

(17) If this water right application is denied, the unavailability of early season water will impact the Refuge's ability and flexibility to adjust wildlife management strategies to correspond to changing migration patterns of waterfowl, wading and shorebirds. Denial of the application would also affect the Refuge's ability to divert, disperse and otherwise control potentially damaging flood events. (Affidavit and Written Direct Testimony of David A. Stanbrough)

(18) The primary instream value on the Donner und Blitzen River is redband trout habitat. ODFW had originally expressed concern that the diversion for application S 84222 would diminish the amount of water directly available for fish habitat. (Direct Testimony of Dwight French; OWRD Ex. 1 335; 439 – 444) These concerns are addressed by conditioning the permit for application S 84222 to allow for bypass flows and by assuring that studies on peak flows will be conducted. (Direct Testimony Dwight French; OWRD Ex. 1 pgs. 335 – 337; Affidavit and Written Direct Testimony of Douglas Alton Young; Affidavit and Written Direct Testimony of Richard R. Roy; USFWS Exhibit 6.)

(19) OWRD concluded that the application could affect the habitat of sensitive, threatened or endangered fish species. (OWRD Ex. 1 at 83 – 84.) OWRD submitted copies of the Initial Review of the application for comment from an interagency review team composed of the ODFW, the Oregon Department of Agriculture, and the Oregon Department of Environmental Quality. (OWRD ex. 1 at 84, Dir. Test. Dwight French at 26.) Following comments from these agencies, including recommendations as to the conditions to be included, OWRD conditioned the draft permit in accordance with the recommendations. (OWRD Ex.1 at 142 – 43; 289 – 90; 362; 460.)

(20) Michael Eberle is a qualified hydrologist for the purposes of determining whether unappropriated water is available to supply the proposed use under application S 84222 at the times and in the amounts requested. (Affidavit and Written Direct Testimony of Michael Eberle, pgs. 1 – 3; Direct Testimony of Richard M. Cooper, pgs. 6 – 11).

(21) The Refuge's primary source of water in the Blitzen Valley is the Donner und Blitzen River. In addition to this source, water enters the valley via a number of tributaries including Mud Creek, Bridge Creek, Krumbo Creek, Kiger Creek, McCoy Creek, and Cucamonga Creek. Additional water is supplied by smaller tributaries such as Swamp Creek and numerous springs including Warm Springs, Knox Springs, Five-Mile Springs, Hogwallow Springs, and Webb Creek Springs. The Donner und Blitzen River supplies the majority of the water for the proposed use, the tributaries contributing far less by way of volume. The two predominant factors affecting the yearly runoff from the

Blitzen Valley drainage are the snow cover on the watershed and the spring climatic conditions. (Affidavit and Written Direct Testimony of Michael Eberle.)

(22) Water is available from the Donner und Blitzen River, McCoy Creek and Kiger Creek to supply up to 820.4 cubic foot per second ("cfs") at times during the proposed period of use in application S 84222. The 820.4 cfs is not available at all times during the proposed period of use but is available at some time every year. (Affidavit and Written Direct Testimony of Michael Eberle, pgs. 8 – 21; USFWS Ex. 8, 9, 33, 42, and 45; Affidavit and Written Direct Testimony of Charles Haapala; Direct Testimony of Richard M. Cooper, pgs. 6 – 11; OWRD Ex. 1 pgs. 188 – 234; 255.)

(23) The Refuge uses a process called "moist soil management" and other management tools, to produce food and suitable habitat for wildlife. In order to promote plant growth and nourish plants, the Refuge has a complex management program. The Refuge uses some water to irrigate fields for farm crops. The Refuge also irrigates native grasses, only some of which is mowed and hayed. The Refuge also irrigates marshes and wetland areas, some of which have shallow standing water on a regular basis. The Refuge uses ponds as part of its biological plan. Most ponds are shallow and dense in emergent vegetation. The Refuge drains all of its ponds in a regular cycle with the intent to promote emergent plant growth as part of its biological plan. Water use in ponds and wetlands at the Refuge varies depending on their current cycle from being completely dry, to a mere sheen of water on the surface, to several feet of water. At all stages the water is being artificially applied to promote plant growth and create wildlife habitat. (OWRD Ex. 1 at 66 – 67; Affidavit and Written Direct Testimony of David A. Stanbrough; Affidavit and Written Direct Testimony of Margaret S. Laws; Affidavit and Written Direct Testimony of Bertie Josephson- Weddell)

(24) The primary goal of the Refuge is to emphasize a diverse mixture of habitats to benefit the groups of wildlife that use those habitats. That wildlife includes 320 species of birds, 58 species of mammals, 10 species of native fish and a number of reptiles and amphibians. Diversion of water outside the irrigation season allows new growth of vegetation and invertebrates, to provide food for many varieties of migratory birds that begin arriving in February of each year. The new vegetation also provides nesting cover for the birds as they arrive. Different varieties of vegetation used by birds for food and shelter require different depths of water at different times in their growing season. To accommodate this requirement, water will be diverted to ponds of different depths, whic will be allowed to dry out as the season progresses. Diversion in the late winter to early spring also allows greater control of the water to avoid flooding, not only of wildlife habitat, but also of adjacent properties, and fields. Application of water outside the irrigation season also benefits grazing and an annual crop of hay within the Refuge as part of a program for developing feeding grounds. (Dir. Test. Dwight French at 9.; OWRD Ex. 1 at 66 – 68; Written Direct Testimony of David A. Stanbrough; Affidavit and Written Direct Testimony of Margaret S. Laws; Affidavit and Written Direct Testimony of Bertie Josephson- Weddell).

(25) It has been the practice of OWRD to impose specified numerical limits on recent permitted water rights involving more than one diversion point, in order to assure that the diversion can be adequately monitored and regulated. (Dir. Test. Mitchell Lewis at 4.) The Refuge has installed an extensive system of measurement devices and gauging stations around the diversion points, allowing measurement of the amount of water diverted at each diversion point, and the amount of water remaining in the stream after the diversion. In addition, the Refuge has prepared extensive and detailed maps of the Refuge and supplied these maps to OWRD. (Dir. Test. Mitchell Lewis at 5.)

VI. STIPULATIONS

In the course of this contested case proceeding, some of the parties entered into stipulated agreements that resulted in the agreement to place specific additional conditions on the permit for application S 84222 and provided for the withdrawal of specific issues from this proceeding as were raised by the parties entering into the agreements. The stipulated agreements are as follows.

A. Agreement by the ODFW, WaterWatch of Oregon, USFWS and OWRD

ODFW, WaterWatch of Oregon, the USFWS and OWRD entered into a stipulated agreement whereby WaterWatch of Oregon withdrew issues it raised in its protest on an agreement that specific conditions would be included in the permit for application S 84222. This stipulation and agreement was served on the ALJ and the parties on February 21, 2001, and received into the record on April 30, 2002.

In signing the agreement, WaterWatch of Oregon withdrew its issues B.1., B.4., B.7., B.9., B.10. and B.13.

In signing this agreement, the ODFW withdrew the concerns it expressed in its request for standing, that the PFO and permit did not "provide sufficient protection for a number of sensitive, threatened, and endangered fish species." Accordingly ODFW's concerns regarding the adequacy of the Division 33 review were withdrawn (Issues B.1. and B.10.)

Pursuant to this agreement, the parties agreed that the permit issuing from application S 84222 shall provide the following conditions.

Flow Conditions

Before certification of this permit, the permittee shall conduct a study that determines flow levels and habitat improvement measures during the period of use covered by this permit (October 1 through March 14) necessary for maintaining and restoring Redband trout and its habitats in the Donner und Blitzen River and its tributaries within the Malheur National Wildlife Refuge. The flow study must be conducted collaboratively with the Oregon Department of Fish and Wildlife at all levels of the study development, including study design, analysis and determination of new flow levels. The flow study shall include an analysis of whether peak flows would benefit Redband trout and their

habitat within the Malheur National Wildlife Refuge and, if so, determine location, duration, and amount of necessary peak flow levels. The necessary peak flows, if any, will be set within the limits of the Refuge's infrastructure. The flow levels determined by the study, including any peak flows, will become a bypass condition in the permit and subsequent certificate. In the interim the following three bypass flow conditions will apply.

1. During diversions under this permit from the Donner und Blitzen River, bypass flows in the Donner und Blitzen river within the Malheur National Wildlife Refuge must be at: 43.0 cubic foot per second (CFS) during the month of October, 45.0 CFS during the month of November, 45.0 CFS during the month of December, 54.0 CFS during the month of January, 52.0 CFS during the month of February, and 73.0 CFS during the period of March 1 through March 14. The flows shall be measured to ensure that diversions are consistent with the bypass flows conditions. Except that, when flows in the Donner und Blitzen River are at or below the prescribed bypass flow levels, up to 5.0 CFS may be diverted from the Donner und Blitzen River to East Canal as measured directly below the diversion point for the East Canal.

2. During diversions under this permit from Bridge Creek, bypass flows in Bridge Creek from the East Canal to the Donner und Blitzen River must be at: 12.0 CFS during the month of October, 11.0 CFS during the month of November, 11.0 CFS during the month of December, 11.0 CFS during the month of January, 11.0 CFS during the month of February, and 11.0 CFS during the period of March 1 through March 14 or the actual flow at U.S. Fish and Wildlife Service gage number 357004 on Bridge Creek (formerly U.S. Geological Survey gage number 10397000), whichever is less. These flows shall be measured directly above the confluence of Bridge Creek and the Donner und Blitzen River.

3. During diversions under this permit from McCoy Creek, bypass flows in McCoy Creek within the Malheur National Wildlife Refuge must be at 5.0 CFS.

Water Quality Condition

In addition, the permit for application S 84222 shall contain the following condition regarding water quality:

> The permittee shall meet state and federal water quality standards and requirements.

Transferability of Certificate

Pursuant to the agreement, the permit shall contain the following section under "Purpose or Use":

> The Water Resources Department has determined that the public interest in this use, as described by the type of use, place of use, and point of diversion, is a "high public interest" use and is conditioned to protect instream values, including habitat for redband trout, as set out in the specific permit conditions. OAR 690-410-0070(2)(a).

In addition, the following shall be included in the permit under the heading "Specific Conditions":

> After permit and associated certificate issuance, no proposed subsequent use of any portion of this water right, or any water right derived from this water right, shall occur unless the Department has determined, following public notice and opportunity for comment, that the proposed subsequent use, as described by the type of use, place of use and point of diversion is a "high public interest" use and is conditioned to protect instream values, including habitat for redband trout.

B. Agreement between the USFWS and the OWRD

On April 29, 2002, the USFWS and the OWRD entered into an agreement whereby the OWRD's policy on livestock watering is clarified and the following condition was stipulated for the permit issuing from application S 84222.

> Livestock watering directly from a stream does not establish a right to make a call against any junior water users holding water rights nor may livestock watering uses be regulated in favor of this or any other right. This condition is a statement of OWRD's policy in regards to livestock watering as articulated in the Field Enforcement Manual. This policy applies to all water rights, whether or not the water right includes this condition. This condition will be in effect so long as the policy is in effect.

This stipulation and settlement agreement was received into the record on April 30, 2002.

C. Agreement between the USFWS, Harney County and the OWRD

Prior to the WRC's January 2005 meeting, the USFWS, Harney County and the OWRD entered into a Settlement Agreement, which is incorporated by reference into this final order. In signing the agreement, which makes modifications to Application S 84222, Harney County withdrew its exceptions to the ALJ's Proposed Order. Pursuant to this agreement, the permit issuing from application S 84222 shall contain the following conditions:

PERIOD OF USE: OCTOBER 1 THROUGH MARCH 1.

MAXIMUM RATE/VOLUME

1. Maximum rate allowed: no more than 820.4 cubic feet per second. The allowed rate being 820.4 from the Donner und Blitzen river (200.0 cfs from Page Springs dam, 20.0 cfs from New Buckaroo Dam, 10.0 cfs from Old Buckaroo Dam, 303.0 cfs from Grain Camp Dam, 166.0 cfs from Busse Dam, 84.0 cfs from Dunn Dam, and 37.0 cfs from Sodhouse Dam), 200 cfs from Bridge Creek, 188.0 cfs from Mud Creek, 50.0 cfs from Krumbo Creek, 200.0 cfs from McCoy Creek, and 250.0 cfs from Kiger Creek

2. Maximum volume allowed: The amount of water authorized under this permit, together with the amount of water authorized under the USFWS's water rights evidenced by certificates 28524, 15198, 15197, and 14367 (or subsequent orders or certificates evidencing these water rights) is limited to a total volume of 145,000 AF annually (calculated on an annual water year of October 1 through September 30 of each year).

3. The permittee shall designate the acreage, annually, that will be irrigated. The use of the full irrigation duty of three-acre feet per acre for the designated irrigated acres will be assumed. The volume remaining will be available for other uses authorized under this permit.

4. When water is being used for irrigation under this permit, the amount of water used for irrigation, together with the amount secured for irrigation under any other right existing for the same lands, is limited to a diversion of one-fortieth of one cubic foot per second (or its equivalent) and 3.0 acre feet for each acre irrigated.

WATER SHARING/SUBORDINATION – DIRECT DIVERSION

If bypass flows as measured at the McCoy Creek gaging station are met, then the permittee may divert up to 20 cfs from McCoy Creek. Thereafter, for purposes of water regulation, so long as at least the bypass flows plus 20 cfs is passing the McCoy Creek gaging station, the Diamond Valley portion of this right shall not have priority over water in excess of this amount up to 20 cfs, not to exceed 6,000 AF, of junior priority date water rights as may be authorized by OWRD. Thereafter, the permittee may take the remaining water as it is entitled under this right.

LARGE STORAGE FACILITY

1. In addition to the subordination above, this permit shall be subordinate, for purposes of water regulation, to junior priority date water rights as may be authorized by OWRD to store water in reservoirs greater that 9.2 AF within the Diamond Valley, not to exceed a total of 600 AF for all reservoirs.

2. This permit shall be subordinate as described in (1) above only if; (a) the junior priority date reservoir(s) will be on tributaries of the major streams (Kiger and

McCoy Creeks) and/or on the minor tributaries of the Diamond Valley (Cucamonga and Swamp Creeks); and (b) the applicant(s) and permittee will coordinate to condition such a new reservoir permit to ensure the Refuge resources and obligations including the bypass flows are protected.

STOCKWATER – DIRECT DIVERSIONS

In addition to the subordinations above, this permit shall be subordinate, for purposes of water regulation, to junior priority water rights as may be authorized by the OWRD to use direct flow diversions into existing ditches, for uses in existence as of December 31, 2004, for livestock purposes during the period October 1 to March 1 of each year.

EXISTING STOCKWATER PONDS/RESERVOIRS

In addition to the subordinations above, this permit shall be subordinate, for purposes of water regulation, to junior priority date water rights as may be authorized by the OWRD to store water for livestock or wildlife purposes so long as: the storage permit is for 9.2 AF or less; the pond/reservoir is an existing un-permitted use that is otherwise not authorized as an exempt use or pond, constructed prior to December 31, 2004; and the application for the livestock or wildlife pond/reservoir is submitted to OWRD prior to December 31, 2009.

FUTURE STOCKWATER PONDS/RESERVOIRS

1. In addition to the subordinations above, for purposes of water regulation, this permit shall not have priority over junior priority date water rights as may be authorized by the OWRD to store water for livestock and wildlife purposes in storage facilities which are less than 9.2 AF in size, up to a total of 700 AF of water subject to the following limitations:

   (i) Up to two hundred and twenty (220) AF from the Diamond Tributaries.
   (ii) Up to one hundred and fifty (150) AF from the Upper Donner und Blitzen River (above Page Springs Dam), Mud Creek, and Bridge Creek basins.
   (iii) Up to three hundred and thirty (330) AF from all other basins within the Donner und Blitzen subbasin.

   This being a combined total from all basins of 700 acre feet.

   3. This permit shall be subordinate as described in (1) above only if such storage facilities will be widely distributed throughout each basin and the permittee's ability to ensure protection of Malheur National Wildlife Refuge resources is maintained. The intent of this subordination is to ensure that the resources of the Malheur National Wildlife Refuge are protected while providing water users the opportunity to submit permit applications for new storage facilities.

VII. CONCLUSIONS OF LAW

A. Water Availability

1. The analysis of water availability is completed by the Department as part of the determination of whether the application is in the public interest. Water is not available at an 80% exceedence level for the proposed use during the months requested.

2. The USFWS's use of this water for the Malheur Wildlife Refuge is a high public interest value use and is conditioned to protect instream values.

B. Public Interest

1. The proposed use, as conditioned by stipulation between the OWRD, USFWS, ODFW and WaterWatch of Oregon, received into the record on April 30, 2002, adequately protects flows for redband trout and other aquatic resources. Notwithstanding this stipulation, the proposed use as conditioned, adequately protects flows for redband trout and other aquatic resources.

2. The proposed use as conditioned, does not create an unlawful instream water right.

3. The proposed use will not injure existing water rights.

4. Livestock watering directly from a stream does not establish a right to make a call against any junior water users holding water rights nor may livestock watering uses be regulated in favor of this or any other right. The proposed use, as conditioned pursuant to the agreement between the USFWS and OWRD, dated April 29, 2002, accurately reflects OWRD's policy in regards to livestock watering watering as articulated in OWRD's Field Enforcement Manual.

5. The proposed permit provides adequate provisions for regulation and enforcement.

6. The specific numerical rate limits given for each diversion point in the draft permit are not a limit on the total quantity of water that may be diverted from each diversion point provided the total amount of water drawn from all diversion points does not exceed the total amount allowed under the permit.

7. The proposed use, as conditioned by stipulation between the OWRD, USFWS, ODFW and WaterWatch of Oregon, received into the record on April 30, 2002, adequately protects water quality.

8. The proposed use is compatible with Statewide Planning goals and local comprehensive plans.

9. The proposed use is not required to be conditioned to prohibit a transfer of the type and place of use under the proposed permit to any non-fish or wildlife related use off Refuge lands because the use is conditioned to require the finding and specific preamble and condition stated in the stipulation between OWRD, USFWS, ODFW and WaterWatch of Oregon as received into the record on April 30, 2002.

10. The proposed use, as conditioned in the stipulation between OWRD, USFWS, ODFW and WaterWatch of Oregon as received into the record on April 30, 2002, complies with OAR Chapter 690, division 33.

11. The proposed use is consistent with the Malheur Lake Basin Program rules as provided in OAR 690-512-0040. In addition applicant has shown that unappropriated water is available to supply the proposed use in the amounts requested.

12. The proposed use is a permissible beneficial use.

13. The proposed use need not be further conditioned beyond what was stipulated to between OWRD, USFWS, ODFW and WaterWatch of Oregon as received into the record on April 30, 2002, to limit future irrigation to irrigation necessary for wildlife needs.

14. OWRD has authority to condition the water rights as suggested in issues B.9 and B.13. Notwithstanding, this issue has been withdrawn as provided in the stipulated agreement OWRD, USFWS, ODFW and WaterWatch of Oregon as received into the record on April 30, 2002.

15. The proposed use does not include use for storage.

16. The Settlement Agreement between USFWS, Harney County and OWRD and subsequent modifications to Application S 84222 provides an opportunity for additional, future water appropriation in the Donner und Blitzen subbasin of the Malheur Lake Basin.

VIII. DISCUSSION

A. The Issues at Hearing

In reviewing an application for a proposed use, the Department shall presume that a proposed use will not impair or be detrimental to the public interest if the proposed use is allowed in the applicable basin program established pursuant to ORS 536.300 and 536.340 or given a preference under ORS 536.310(12), if water is available, if the proposed use will not injure other water rights and if the proposed use complies with rules of the Water Resources Commission. This shall be a rebuttable presumption and may be overcome by a preponderance of the evidence that either: a) one or more of the criteria for establishing the presumption are not satisfied; or b) the proposed use will impair or be detrimental to the public interest as demonstrated in comments or in a protest. ORS 537.153(2).

In this case, the Department could not find that water is available for the proposed use pursuant to its definitions for water availability. OAR 690-300-0010(57). Therefore, the Department did not establish the public interest presumption for application S 84222. Instead, the Department made specific findings to demonstrate that even though the presumption is not established, the proposed use will not impair or be detrimental to the public interest. OAR 690-310-0120(2). Accordingly, the Department proposed approval of the application with appropriate modifications and conditions. OAR 690-310-0120(2)(b).

Upon issuance of the PFO for application S 84222, the Department received the protests described above. In the ensuing contested case hearing, protestants had the burden of showing by a preponderance of the evidence why the proposed use will impair or be detrimental to the public interest. As to each issue raised by the protests, protestants failed to rebut the determination that the proposed use would not impair or be detrimental to the public interest for the reasons asserted in their protests. A discussion of these issues follows.

Issue A.1. – Water is Not Available for the Proposed Use at an 80% exceedence level

As provided above, the public interest presumption can only be set if among the other factors listed at ORS 537.153, water is available for the proposed use. "Water availability" is defined at OAR 690-300-0010(57) and provides that water is available for a proposed use if the requested source is not over-appropriated during any period of the requested use. Over-appropriated in turn, means that a requested source must have unallocated water available at an 80% exceedence level. OAR 690-410-0010(11). The Department completed an assessment of water availability for application S 84222. This assessment determined that water is not available for further appropriation at an 80% exceedence level during each month of the requested use.

Issue A.2. – The Proposed Use of This Water is a High Public Interest Value Use and The Use is Conditioned to Protect Instream Values.

1. The public interest in this use is "high"

OAR 690-410-0070(2)(a) provides that when a surface water body is over-appropriated, additional uses may be allowed if it is determined that the public interest in the use is high and the use is conditioned to protect instream values. The "public interest" in turn means a beneficial use which is consistent with state law and includes providing the greatest good for the people of the state based on current values, protecting water rights and conserving water resources for present and future generations. OAR 690-400-0010(12).

Pursuant to OAR 690-410-0070(2)(a), the OWRD has developed a set of factors for determining whether a the public interest in a particular use is "high." The criteria or factors for determining the value of the public interest include: the necessity of the use, the benefits of the proposed use to the public, positive impacts of the proposed permit to the public, benefit to other water users, benefit to the area of use, importance of the use to the area, environmental benefits, existence of other possible sources of water, and possible negative impacts to denial of the permit. The evidence in the record supports a finding for each of these factors and for a determination that the public interest in the use is high.

Water For Life argues that the public interest in the proposed use is not "high" because the analysis provided by OWRD does not consider future uses which should be considered since a determination of the public interest as defined at OAR 690-400-0010(12) includes reference to "protecting water rights and conserving water resources for present and future generations." Notwithstanding this assertion, Water For Life has provided no evidence of specific future uses that would be harmed by this appropriation. Although witnesses testifying on behalf of Water for Life expressed opinions that the proposed use will "preclude potential options for future management of the Steens Mountain Cooperative Management and Conservation Area" there is no evidence in the record that the proposed use lies within the Steens Mountain Cooperative Management and Conservation Area, nor is there evidence of specific contemplated uses that would be jeopardized by the appropriation under application S 84222.

Water for Life also argues that the public interest in the proposed use is not "high" because "Harney County's economy is better served by applying any available non-irrigation season water to other local projects." (Direct Testimony of Gary Marshall) Notwithstanding this opinion, there is no evidence in the record to support either harm to Harney County's economy if the proposed use is allowed, nor is there any evidence of the local projects that would be better served through disallowing this use.

Finally, Water for Life asserts that the proposed use will have a negative effect on the health of the Malheur Watershed and that the proposed use will propagate noxious weeds. Again, the record does not support this argument. Rather, the record shows that

the applicant is aware of noxious weed problems and is actively engaged in programs for elimination of noxious weed on the Malheur National Wildlife Refuge. (Written Rebuttal Testimony of Margaret S. Laws; USFWS Exhibit 47, pgs. 31 – 35.)

The record provides sufficient evidence to support a finding that the public interest in the proposed use is high.

2. The use is conditioned to protect instream values.

Water for Life and WaterWatch of Oregon initially raised the issue of whether the proposed use adequately protects instream values. While WaterWatch resolved this issue by stipulation, Water for Life did not. Consequently Water for Life had the burden of showing that the proposed use does not protect instream values. ORS 537.153(2) (protestants bear the burden of proof to rebut findings that the proposed use will impair or be detrimental to the public interest). It has not met this burden.

The proposed use has been reviewed by ODFW pursuant to OAR Chapter 690 Division 33 and the permit for the proposed use incorporates the comments as ODFW recommends (see below discussion). Any other reservations ODFW had regarding the effectiveness of the bypass flow or the protection of peak flows have been addressed through its stipulated agreement with USFWS, OWRD and Water Watch. Consequently, because the OWRD has complied with the requirements of OAR 690-033-0330 and because OWRD will incorporate further conditions per the stipulations it has entered into with ODFW, USFWS and WaterWatch of Oregon, the proposed use is conditioned to protect instream values.

Because the public interest in the proposed use is "high" and the use has been conditioned to protect instream values, the proposed use will not impair or be detrimental to the public interest even though the waters requested for application S 84222 are "over-appropriated." OAR 690-410-0070(2)(a).

Issue B.2. –The Proposed Use, As Conditioned, Does Not Create an Unlawful Instream Water Right.

The OWRD proposed a bypass flow condition for application S 84222 in response to ODFW's concerns about the effect of the proposed water right on flows needed for sensitive fish species. A bypass flow is a specific amount of water that must flow past a particular point of diversion before the water right holder subject to the bypass flow condition may begin to divert. The stipulation discussed above identifies bypass flow for the proposed diversion of the Donner und Blitzen River, Bridge Creek and McCoy Creek.

Protestants Water for Life and HSWCD argue that the OWRD is creating an instream water right that violates Oregon law when it requires a bypass flow condition as a condition of water use under application S 84222. (Water for Life Protest at 11; Water for Life Exceptions at 4 – 5; HSWCD Protest at 3.)

The OWRD argues that the protestants have failed to acknowledge that there are important distinctions between an instream water right and a bypass flow. These bypass flows are permit conditions and, as such, are enforceable only against the permit holder. (OWRD's Opening Brief at 4.) In contrast, an instream water right is an actual water right defined by statute:

> [A] water right held in trust by the Water Resources Department for the benefit of the people of the State of Oregon to maintain water in-stream for public use. An in-stream water right does not require a diversion or any other means of physical control over the water.

ORS 537.332(3).

We find in favor of the OWRD on this issue. The bypass flow condition for application S 84222 serves only to specify the discharge of water that must be present in the water bodies USFWS will divert from. These bypass flows are not held in trust for the people of Oregon and do not create a protected interest in the flow passing by the points of diversion.

Likewise, although Water for Life argues that the bypass flow condition on the draft permit for Application S 84222 "requires the applicant to leave a minimum perennial streamflow in the stream in order to protect fish species' habitat," we agree with the Department that this argument fails because a bypass flow does not create a minimum perennial streamflow. (OWRD's Response at 1.) A minimum perennial streamflow is an administrative rule that establishes a flow necessary to support aquatic life or minimize pollution. *See* ORS 536.235; OAR 690-076-0010(7). Again, it must be pointed out that the proposed bypass flow is a permit condition applying only to the permit holder, not an administrative rule applying to all water users in the basin. It does not protect the flow passing by against other appropriators, as would a minimum perennial streamflow.

Water for Life also argues that the OWRD is giving the USFWS "responsibilities for presumably competing instream water needs" between migratory birds and fish and is thereby granting an "unauthorized delegation" of state water management responsibilities to USFWS. (Water for Life at 3.) We agree with the OWRD that the proposed permit delegates nothing to the applicant, but merely restricts applicant's use of water under the permit. (OWRD's Response at 2.)

Finally, Harney County argues that the OWRD has erred by creating an unlawful instream water right that does not comply with the requirements of ORS 537.338 and OAR 690-077-0020. (Harney County Brief at 9 – 11). However, whether or not the bypass flow condition complies with these statutes is irrelevant, as the bypass flow condition serves only to limit applicant's ability to withdraw water; the status of the water comprising the flow is unaffected by the condition. (OWRD Response at 3.) The use of the term "instream flows" in the portion of the draft permit describing bypass flows does not create an instream water right where none exists. (OWRD Reply at 2.)

Issue B.3. – The Proposed Use Will Not Injure Existing Water Rights

The OWRD requests a ruling that the proposed use will not injure existing water rights. It points out that under the provisions of ORS 537.153, the Department must presume that a proposed use will not impair or be detrimental to the public interest if the proposed use is allowed in the applicable basin program established pursuant to ORS 536.300 and 536.240 or given a preference under ORS 536.310(12), if water is available, if the proposed use will not injure other water rights, and if the proposed use complies with the rules of the Water Resources Commission. (OWRD's Brief at 5.) We find for the Department on this issue.

"Injury" occurs when a water right does not receive the water to which it is legally entitled. OAR 690-017-0005(5). When making water allocation decisions, the Department determines whether or not issuance of a new water right will result in injury to existing water rights such that existing water rights would not receive legally-entitled water. (OWRD's Brief at 6.) The Proposed Final Order ("PFO") for application S 84222 concludes that "proposed use will not injure other water rights" because the tentative priority date of this application sets it as the most junior use in the Basin." (OWRD's Brief, Ex. A at 17 & 26.) As the most junior use in the basin, the USFWS will not be able to request regulation on water that has a senior priority date, and would itself be regulated to meet a call by a more senior right. The permit thus reads: "[t]he use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flow." (OWRD's Brief, Ex. A at 17.)

Protestants Water for Life and HSWCD assert that granting the water right will injure existing water rights in three aspects. (Water for Life Protest at 3; HSWCD Protest at 1; Department's Brief at 6.) First, Water for Life asserts that the proposed use "will limit the ability of Hammond Ranches to store water in Kern Reservoir." (WFL Protest at 3.) The Hammonds hold a water right upstream of the proposed point of diversion with a priority date of April 25, 1980 (R 8487) to store water from Krumbo Creek in Kern Reservoir. (Department's Brief, Ex. B.) This water right is approximately 20 years senior to the tentative priority date for application S 84222. Because application S 84222 holds a junior priority date, it would be regulated to satisfy a call for the Hammond's senior right. The proposed use, cannot be used to the injury of the Hammond's senior water right. (OWRD Brief at 6.)

Water for Life and HSWCD also argue that this application will limit protestant's ability to store water in preexisting ponds exempt from Department regulation under ORS 537.405. (WFS Protest at 3; HSWCD Protest at 1.) However, holding water under a surface water exemption means that the holder does not have a legal interest in the water that is recognized by the Department. ORS 537.141. Accordingly, such a surface water exemption is not subject to protection and regulation through the priority system. *See* ORS 540.045 (watermaster regulates according to user's "water rights of record in the [Department]"). Because an exempt surface water use does not create a water right of

record subject to protection and regulation under the priority system, it is not subject to an injury analysis. (OWRD's Brief at 7.)

The Department also argues persuasively that there can be no "injury" to the protestants' interest in stock watering as this is also an exempt use under Oregon law. If protestants are using surface water pursuant to this exemption, the Department cannot regulate this use to meet the call of a water right. *See* ORS 537.141; 540.045. Water for Life argues that the term "existing rights" as used in ORS 537.160(1) includes exempt uses which must be accounted for in determining whether a proposed use will injure existing rights pursuant to ORS 537.153. (WFS Brief at 3.) However, this analysis errs on two points. (OWRD's Brief at 7.) First, exempt uses are not "water rights." The statute refers to "rights" not "uses." The Department need only account for water rights in determining whether or not a new application is in the public interest. *See PGE v. Bureau of Labor and Industries*, 317 Or 606, 610 (1993) (the text of a statute is the starting point for interpretation.) Further, exempt uses are not affected by new water allocations because they are allowed regardless of whether the water they use is appropriated by someone else. The issuance of a new water right does not preclude exempt stock watering uses. (OWRD Response at 3.)

Water for Life argues that the applicant has historically been unable to manage their water during the storage season in a way that does not result in flooding to neighboring lands, and must therefore prove that the new use "will not exacerbate flooding impacts during non-irrigation season." (WFL Protest at 4.) Again, we agree with the Department that the test for injury is whether the proposed use would result in a water right not receiving the water to which it is legally entitled. The Department's injury determination does not encompass civil claims against the applicant. (OWRD's Brief at 8.)

Finally, notwithstanding that this use is the most junior water right in the basin, the permit for application S 84222 is conditioned such that use of water may only occur at times when sufficient water is available to satisfy all prior rights. In addition the USFWS may only appropriate water when bypass flows as identified in the permit are present or exceeded. Given these flows, sufficient water should be available to satisfy downstream water rights. In conclusion, the use as conditioned will not injure existing water rights.

Issue B.5. – The Proposed Permit Provides Adequate Provisions for Regulation and Enforcement.

As a condition of the permit issuing for application S 84222, the OWRD is requiring the applicant to provide access to any meter or measuring device on the property. The record indicates that watermaster access is not a barrier to effective enforcement. In addition, the applicant has provided detailed maps of the Malheur National Wildlife Refuge so that diversion points can be readily located for enforcement purposes. Applicant has also installed an extensive gauging system, which allows monitoring of the flow at each diversion point, and has provided OWRD with a

measurement plan. Finally, the Refuge has been submitting annual water user reports to OWRD. In conclusion, we find that the proposed use as conditioned can be monitored and regulated with precision and assurance.

Issue B.6. – The Specific Numerical Rate Limits for Each Diversion Point Do Not Limit the Total Quantity of Water That May Be Diverted from Each Diversion Point.

No statute or rule has been cited in the record providing that binding numerical limits must be imposed on the quantity of water that may be diverted at each diversion point. As Mitchell E. Lewis testified, (Dir. Test. Mitchell E. Lewis at 4.), there are a number of older permitted water rights that do not provide such limits. Lewis testified that it has been the practice of OWRD to impose such limits on recent permitted water rights involving more than one diversion point, in order to assure that the diversion can be adequately monitored and regulated. However, given the extensive provision for monitoring and regulation of diversions under this application, such a requirement is not necessary in this case. Moreover, while there are several points of diversion, all of them, ultimately derive from the same drainage, and use of water by the Malheur National Wildlife Refuge from all these diversion points is junior to the other holders of water rights on these sources. Consequently, the specific numerical limits given for each diversion need not be a limit on the quantity of water diverted from each diversion provided the total amount of water diverted at all diversion points does not exceed the maximum allowed under the permit.

Issue B.8 – The Proposed Use is Compatible with Statewide Planning Goals and Local Comprehensive Plans.

Protestant's Water for Life and Harney County argue that the proposed use fails to comply with statewide planning goals and local comprehensive plans and that the application is incomplete because it does not contain a compatibility statement. (WFL Brief at 4; Harney County Brief at 6 – 9.) The OWRD and USFWS argue that the Department has met the requirements of its land use compatibility program and further local land use laws do not apply to the Malheur National Wildlife Refuge because it is federal land. (OWRD's Response at 4; USFWS Memorandum Supporting Motion at 6.)

We agree with the analysis of the Department and the USFWS. First, local or state land use laws appear not to apply to the Refuge. Federal land management statutes, such as those that control Refuge management usually preempt state land use planning laws. (OWRD's Brief at 8.) Although the Supreme Court has held that state regulation of state and private activities on public lands is presumed valid unless it conflicts with federal legislation, the burden shifts when examining whether a state may regulate the activities of the federal government on federal land. In this case, the United States is not just exercising its proprietary interest in federal land, it is exercising sovereign power over property belonging to it. *United States v. Gardner*, 107 F. 3d 1314 (9th Cir. 1997). Therefore, federal legislation must specifically authorize state law to regulate the federal activity in question. If no specific federal legislation exists, then the state has no authority to regulate the particular federal activity on federal land. Here, there has been

no federal legislation authorizing state regulation of federal activity on Refuge land, and, therefore, the state may not require or enforce state land use planning requirements or local comprehensive plans on the Malheur National Wildlife Refuge. (USFWS Memorandum at 9.)

Even if the proposed use is incompatible with Harney County's comprehensive plan, the proposed action is not subject to OAR 690-005-0035 or the alternative dispute resolution process provided in the rule, as federal law does not provide for mandated alternative dispute resolution processes in the case of conflicts between federal and state law. *Kleppe v. New Mexico*, 426 US 529 (1976) ("Congress has the power to enact legislation respecting [federal] lands under the Property Clause [and] such legislation necessarily overrides conflicting state laws under the Supremacy Clause. U.S. Const. Art. VI, cl.2.".)

The OWRD argues that it has acted consistently with its own rules, which were adopted pursuant to and consistent with the statutory requirements of ORS 197.180. Agencies may comply with the compliance and compatibility requirements of ORS 197.180(1) by adopting and implementing a state agency coordination program that is consistent with ORS 197.180(1) that is certified by the Department of Land Conservation and Development ("DLCD") under ORS 197.180(4), (5), and (6). DLCD certified the Department's State Agency Coordination Program ("SAC") on December 20, 1990. The SAC program consists of a guidance document, Land Use Planning Procedures Guide, and administrative rules set forth in OAR chapter 690, division 5. These rules provide that where the subject activity affects federal agencies, the Department shall take actions "described in its [Guide]." OAR 690-005-0055. For land use coordination with federal agencies, the Guide, in Section IV, provides that "[a]pplications for water uses on federally owned lands are not subject to land use information requirements as are other applications."

Because the Department's rules for compliance with local land use planning exempt federally owned lands from further land use coordination, we find for the Department on this issue.

Issue B.10 – The Proposed Use, As Conditioned, Complies with OAR Chapter 690, Division 33.

OAR 690-033-0330 provides in pertinent part as follows:

Review of Proposed Water Use

(1) If the Department concludes during the initial review that a proposed water use will occur in an area that may affect the habitat of sensitive, threatened or endangered fish species, the Department shall:

(a) Notify the applicant that based on a preliminary determination, the proposed use may affect the habitat of sensitive, threatened

or endangered fish species and the application may be conditioned or denied.

(b) Notify the interagency review team that an application has been received in an area that may affect the habitat of sensitive, threatened or endangered fish species.

(2) The interagency review team shall be convened, as needed, to review applications which the Department determines may affect sensitive, threatened or endangered fish species. Participating agencies may also request interagency review of specific applications. When reviewing applications, the interagency review team shall apply the following standards:

(c) In areas of the state outside of the Columbia Basin where threatened and endangered fish species are located, no loss of essential habitat as defined in OAR 635-415-0005(4).

(3) The interagency review team, whenever possible, will recommend conditions to the application necessary to achieve the standards listed in OAR 690-033-0330(2)(a) and (b).

(4) If the interagency review team cannot identify conditions that meet the standards listed in OAR 690- 033-0330(2)(a) and (b), the interagency review team shall recommend denial of the application unless it concludes that the proposed use would not harm the species.

In this case, OWRD concluded that the application could affect the habitat of sensitive, threatened or endangered fish species and therefore consulted the interagency review team, composed of the ODFW, the Oregon Department of Agriculture, and the Oregon Department of Environmental Quality ("DEQ"). Upon review of the application ODFW and DEQ provided comments to the OWRD regarding conditions for the water right to assure that the proposed use did not result in a net loss of essential habitat for sensitive, threatened or endangered fish species.

ODFW's concerns regarding application S 84222 raised concerns regarding net loss of essential habitat for redband trout, an Oregon state sensitive listed fish species. ODFW comments indicated that the proposed use could affect the spawning, incubation and rearing stages of redband trout as well as passage and habitat values. ODFW was also concerned that diversion of winter flows for the purposes of this use could diminish the morphological benefits of these peak flows. ODFW's concerns regarding fish passage were twofold and based on concerns of allowing passage for native redband trout, and preventing passage of invasive carp species that have caused declines in the productivity of habitat for water-dependent bird species. The record reflects that ODFW and OWRD worked together to fashion permit conditions to address each of these

concerns and that the use as conditioned will ensure no net loss of habitat for redband trout as well as ensure proper fish screening and passage.

DEQ also commented on application S 84222 as the Donner und Blitzen River is listed as "water quality limited" pursuant to the Clean Water Act's 303(d) list for temperature during the summer and possibly early fall months. Although DEQ did not know whether or not water quality standards would be violated as a result of both the withdrawal and the return flows from the resulting irrigation, DEQ recommended that the permit for S 84222 contain a requirement that the "permit holder establish and implement a water quality monitoring plan to determine water quality impacts from the withdrawal and return flows." (OWRD Ex. I, pg. 320.) In response to DEQ's concerns, the OWRD has conditioned the permit to provide that within one year of permit issuance, the permittee shall develop and submit a Water Quality Monitoring Plan that will then be approved by OWRD in conjunction with DEQ.

Because OWRD has submitted this application to the interagency review provided in OAR 690-033-0030 and has conditioned the permit to protect the public interest in fishery resources, the proposed use as conditioned in the permit complies with the requirements of OAR 690-033-0330.

Issue B.11 – The Proposed Use is Consistent with the Malheur Lake Basin Program Rules.

The Malheur Lake Basin Program rules provide that the Department shall not accept an application or issue a permit for any surface water use unless "the applicant shows, by a preponderance of evidence, that unappropriated water is available to supply the proposed use at the times and in the amounts requested." OAR 690-512-0040. The water availability evidence in turn, must be "prepared by a qualified hydrologist or other water resources specialist and shall include:

> (a) Streamflow measurements or gage records from the source or, for use of groundwater, the stream in hydraulic connection with the source; or
>
> (b) An estimate of water availability from the source or, for use of groundwater, the stream in hydraulic connection with the source which includes correlations with streamflow measurements or gage records on other, similar streams and considers current demands for water affecting the streamflows.

OAR 690-512-0040(1)

Because of the basin program rule for the area of the proposed use, OWRD required the applicant to submit evidence to establish that water was available for the proposed use per the basin plan rule. Accordingly, applicant submitted to OWRD a water availability analysis prepared by a qualified hydrologist. This analysis, which used actual

gage flow records as well as derived statistical relationships between stream flows for the Donner und Blitzen River and various tributaries established that water in the amount requested is available for the proposed use, albeit not for each month of the requested use and perhaps not every year. OWRD reviewed the evidence presented to it and concluded that for the purposes of OAR 690-512-0040, applicant had established water availability and hence compliance with the Malheur Lake Basin Program rules

Protestants assert that water is not available for the proposed use on a regular basis if at all. However, such requirement of continual availability as protestants assert is not provided in the basin program rule and nothing in the record rebuts the evidence submitted by the applicant for the purposes of illustrating compliance with OAR 690-512-0040. Though the full 820 cfs may represent a peak flow with a less than annual recurrence, applicant has established that use of any water up to 820 cfs will be beneficially used for the purposes described in the application. Accordingly, the proposed use is consistent with the Malheur Lake Basin Program.

Issue B.12 – The Proposed Use is a Permissible Beneficial Use

Protestant Water for Life argues that "wildlife refuge management" is not a beneficial use because this use is not enumerated in the Department's statutes and rules as a beneficial use. (WFL Protest at 6.) We agree with the Department that whether or not a use is enumerated by statute or rule is not determinative of whether a use is beneficial. The lists of beneficial uses are not exclusive and "wildlife refuge management" satisfies the criteria for beneficial use. (OWRD Brief at 9.)

"Beneficial use" is the "basis, the measure and the limit of all rights to the use of water in this state." ORS 540.610. "Beneficial use" is the "reasonably efficient use of water without waste for purposes consistent with the laws, rules and the best interests of the people of the state." OAR 690-300-0010(5). Although the OWRD's rules identify many specific beneficial uses, beneficial uses are not limited to those uses enumerated by Department rules. The limit on whether a use is beneficial is whether the use is reasonably efficient, and is for a purpose that is consistent with the laws, rules and best interests of the people of the state. *Id.*

Water for Life argues that "wildlife refuge management" is not a beneficial use because it "incorporates an unlimited number of other unspecified uses." (WFL Brief at 4.) We agree with the Department that this use does not incorporate unspecified uses.[3] The applicant itself recognizes that the use is limited as specified in the PFO. (USFWS Brief at 10.) Wildlife refuge management is a beneficial use because the use is reasonably efficient and consistent with the laws, rules and best interest of the people of the state and is not otherwise prohibited by statute or rule. OAR 690-300-0010(5).

[3] The draft permit for application S 8422 provides that the "purpose or use" of the water is for "wildlife refuge management which may include wildlife uses, aquatic life, wetland enhancement, riparian area enhancement, fire protection, irrigation use, stock watering, recreation use, construction, flood control, reservoir maintenance, and dust control." (OWRD Brief, Ex. A.)

Water for Life argues that the use is not beneficial because it does not comply with the Malheur Lake Basin Program Plan because there is no water available. (WFL Brief at 5.) We agree with the Department that the issue of availability of water is distinct from the issue of whether a use is beneficial and that the proposed use is not prohibited by the Malheur Lake Basin Plan.

Issue B.15. – The Proposed Use Does Not Include Storage

As provided in finding of facts 2, 6 and 7, the application does not include provisions to store water. The application does include provision for areas of standing water, but the uses associated with this standing water are distinct from a storage use, in that the water is intended for the propagation of vegetation within the areas of standing water, rather than for storage of water for future beneficial use. .

Issue C – The Proposed Use is not Required to be Consistent with the Donner und Blitzen River Decree

Protestants Harney County and Water for Life argue that the PFO is inconsistent with the decree determining the relative rights of claimants on the Donner und Blitzen River issued by the circuit court in Burns, Oregon, on January 8, 1942. (Donner und Blitzen Decree.) The decree specifies the relative rights of the parties to the decree and is binding on the parties and the water rights adjudicated thereunder. ORS 539.200. The decree also specifies the months in which the irrigation rights under the decree may be exercised, and specifies the duty for these irrigation rights.

The OWRD argued that the use proposed by S 84222 does not, as a matter of law, have to be consistent with the Donner und Blitzen decree. We agree. An order issuing a new water right on the Donner und Blitzen has no legal effect on the rights established by the Donner und Blitzen Decree or on the decree itself. ORS 539.200. The Department does not dispute that a decree is *res judicata* as to the claims, the parties, and their successors in the decree adjudication. However, the principle does not extend to bind future water right applications.

The Oregon Supreme Court has specifically held that adjudication decrees are not binding on rights that did not exist at the time of the decree:

> A [water right adjudication] decree is not and cannot be considered as operating as an estoppel as to facts which did not occur or rights which did not accrue until after the particular judgment was rendered and which were not involved in the suit in which it was rendered. A decree is not conclusive upon any point or question which from the nature of the case, the form of the action, or the character of the pleadings could not have been adjudicated in the suit in which it was rendered; nor as to any matter which must necessarily have been excluded from consideration in the case as being beyond the jurisdiction of the particular court.

Masterson v. Pacific Live Stock Co., 144 Or 396, 404 (1933).

We agree with the Department that the Donner und Blitzen Decree was limited in application to the water rights recognized therein. (OWRD Reply, Exhibit C at 6.) The court did not purport to establish a distribution law or conditions of general applicability to all future water rights. Rather, it specifically confined its determination to the claims under review. Likewise, while ORS 539.200 provides that adjudication determinations "shall be conclusive as to all prior rights and the rights of all existing claimants upon the stream," it does not bind or determine the conditions of all future water rights determinations by parties to the decree. As the court recognized, future water rights are not within the subject matter of an adjudication.

Finally, OAR 690-250-0070(1) does not make the decree binding on this water right. Rather, the rule simply provides a default season of use "[w]henever the dates or times of the year within which an irrigation right may be exercised are not specified in decree, permit, certificate, order or basin program." OAR 690-250-0070(1). Here, the permit specifies the times of the year in which the irrigation right may be exercised and the rule is inapplicable.

Issue D – The Proposed Use May be Approved Prior to Applicant Entering Into Formal Consultation and Formal Conference under the Endangered Species Act and Before Performing a Compatibility Analysis under the National Wildlife Refuge Administration Act.

Water for Life argues that if the OWRD issues a water right "when it is doubtful" that the use is "authorized under federal law," it is allowing a use that is "wasteful and unreasonable" and thus a use that will impair or be detrimental to the public interest pursuant to ORS 537.153 . Protestant asserts that allowing such use is analogous to granting an applicant a permit absent proof that applicant has obtained an easement or written authorization permitting access to non-owned land crossed by the proposed ditch, canal or other work pursuant to ORS 537.211.

We agree with the Department that the analogy is inapt. ORS 537.211 is a state statute that addresses obtaining easements for lands that may be accessed but not owned by a water right applicant. Consultation under the Endangered Species Act ("ESA") or compliance with the National Wildlife Refuge Administration Act ("NWRAA") are matters of federal law. Nothing in OWRD's water right permitting statutes or rules requires that the OWRD deny or hold water right applications pending federal consultation under ESA or compliance with NWRAA. Nor have protestants provided any other authority for such requirement. Accordingly, the proposed use may be approved prior to the applicant entering into formal consultation and a formal conference under the ESA or prior to performing a compatibility analysis under the NWRAA.

Issue E – The Approval of Application S 84222 Will Not Result in A Federal Reserved Water Right.

Protestant HCSWCD argues that the approval of application S 84222 will result in a federal reserved water right. (HCSWCD Protest.) Although Protestant Water for Life did not raise this issue in its protest and cannot raise it as its own issue now,[4] Water for Life argued in the course of briefing and in its exceptions that the state water right permit to USFWS will result in a federal reserved water right. (Water for Life Brief at 10; Exceptions at 10.)

A federal reserved water right stems from an act of the federal government. The seminal reserved water right case is *Winters v. United States*, 207 US 564 (1908). There, the Court ruled that when the federal government reserves a part of the public domain (in that case the Fork Belknap Indian Reservation) for a particular purpose, it impliedly also reserves sufficient unappropriated water to fulfill the purposes of the reservation. *See also Cappaert v. United States*, 426 US 128 (1976)(explaining and applying federal reserved water right doctrine.)

In contrast to a federal reserved water right, a water right acquired by the federal government through the state is acquired through state, not federal law. A federal reserved water right stems from a federal act reserving public lands or waters. A federal agency acquiring a water right through a state appropriation system results only in the federal government holding a state water right.

Water for Life argues that by "allowing applicant to define [the] beneficial use as unlimited," the Department has relinquished its ability to regulate the use of this water, resulting in an "abrogation of state sovereignty" and a *de facto* federal reserved water right. (WFL Brief at 10.) We agree with the Department that the terms of the permit will not abrogate any of the state's sovereignty. The use is not "unlimited" as evidenced by the lengthy permit conditions determining the allowed use of the water. Further, failure of the permit holder to comply with the terms of the permit could result in the state's cancellation of the permit. ORS 537.260.

Issue F – The Non- Use of Current Water Rights and the Question of Whether Those Acres Subject to Non Use Should be Forfeited is Irrelevant to These Proceedings

Protestant HCSWCD raised the issue of whether there is non-use of current water rights, and if so, whether it should be required that acres subject to non-use be forfeited. As a preliminary matter, the OWRD and USFWS assert that this issue is irrelevant to this proceeding. HSWCD asserts in its brief that this issue is related to beneficial uses as "the Refuge is not using its existing water rights to the full allocation." (HSWCD Brief at 1.)

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[4] ORS 537.170(5) provides that each person submitting a protest must raise "all reasonably ascertainable issues and submit all reasonably available arguments" by the close of the protest period or those issues will be precluded from judicial review. Water for Life did not raise the issue of whether the proposed use created a "de facto" federal reserved water right and accordingly, Water for Life cannot obtain judicial review on this issue.

The Department replies by arguing that the question of whether existing water rights have been forfeited is distinct from the question of whether a new water right should be issued. This proceeding concerns an application for a new water use permit, which is reviewed to determine whether the proposed use will impair or be detrimental to the public interest. ORS 537.153. The application review process includes consideration of water availability, injury to existing water rights, and impairment of the public interest. We agree with applicant and the Department that considerations of the status of existing water rights held by applicant are inapplicable to this inquiry.

B. Exceptions

Protestant Water for Life Exceptions

Exception 1: Andy and Vena Dunbar were represented by Water for Life, Inc. They did not appear pro se as characterized in the Proposed Order pgs. 1 & 2. (Water for Life ("WFL") Exceptions pg. 1.)

Commission Determination: ORS 537.170 provides that any person may submit a protest against a proposed final order. The statute also provides that a person may represent the public interest provided that public interest is precisely articulated. Further, a protest must be accompanied by the protest fee described in ORS 536.050. Water for Life filed one protest and one protest fee and articulated that it, as an organization, was representing the public interest of its constituents Hammond Ranches, Inc.; Andy and Vena Dunbar dba Open AT Ranch; and Harney County Haygrowers Association. Therefore, Water for Life only is the protestant and party to this matter. The record reflects that WFL filed a protest on behalf of the public interest. This Final Order reflects the appearance of Andy and Vena Dunbar at the contested case hearing: "Protestant Water for Life, including Dwight and Susan Hammond, Andy and Vena Dunbar, and the Harney County Haygrowers Association, appeared through and with its attorney Brad Harper." *This exception is allowed.*

Exception 2: WFL's client's name is Vena, not Vera, Proposed Order at 1-2. (WFL Exceptions pg. 1.)

Commission Determination: This Final Order reflects correction in all references to Vera Dunbar. *This exception is allowed.*

Exception 3: WFL's client's name is Susan Hammond, not Suzi as reflected in the Proposed Order at pg. 1. (WFL Exceptions pg. 1.)

Commission Determination: This Final Order reflects correction in all references to Suzi Hammond. *This exception is allowed.*

Exception 4: WFL's affiant's name is Stacey Davies, not Sacey Davis as reflected in the Proposed Order at pg. 2.

Commission Determination: This Final Order reflects correction in all references to Sacey Davis. *This exception is allowed.*

Exception 5: The contested case hearing was held in Burns, Oregon on April 30, 2002, and was completed that same day with the record left open for submission of maps from Protestant Harney County Soil and Water Conservation District and a stipulation from Harney County. The hearing did not last two days as is reflected in the Proposed Order at pg. 2. (WFL Exceptions pg. 2.)

Commission Determination: This Final Order reflects that the contested case hearing was held in this matter on April 30, 2002. *This exception is allowed.*

Exception 6: No court reporter was present and, therefore, no written transcript is available for consideration as reflected in the Proposed Order at pg. 3. (WFL Exceptions pg. 2.)

Commission Determination: This Final Order reflects that the record of the cross-examination hearing consists of audiotapes. *This exception is allowed.*

Exception 7: WFL asks that the following paragraph be added to the Final Order (WFL Exceptions, pg. 2):

> **BACKGROUND**
>
> Applicant is seeking a water right for 820.4 cubic feet per second [cfs] from the Donner und Blitzen River for use within the boundaries of the Malheur National Wildlife Refuge from October 1 through March 15 of each year (non-irrigation season). As part of the water right application, USFWS is proposing to establish a new type of beneficial use in Oregon: "wildlife refuge management." According to the Applicant and the Water Resources Department [Department], wildlife refuge management comprises the following beneficial uses currently recognized by administrative rule: wildlife use, aquatic life, wetland enhancement, riparian area enhancement, fire protection, irrigation use, stock watering, recreation use, construction, flood control, reservoir maintenance, and dust control. Proposed Order at 6.

Commission Determination: The statement "[a]ccording to the Applicant and the Water Resources Department [Department], wildlife refuge management comprises the following beneficial uses…" is not an accurate reflection of the record. In his Order on Legal Rulings, issued, on November 11, 2001, the Administrative Law Judge ("ALJ") determined that wildlife refuge management is a permissible beneficial use notwithstanding WFL's arguments to the contrary. The ALJ found that:

> "'[b]eneficial use' is the 'basis, the measure and the limit of all rights to the use of water in this state.' ORS 540.610. "Beneficial use' is the

'reasonably efficient use of water without waste for purposes consistent with the laws, rules and the best interests of the people of the state.' OAR 690-300-0010(5). Although the OWRD's rules identify many specific beneficial uses, beneficial uses are not limited to those uses enumerated by Department rules. The limit on whether a use is beneficial is whether the use is reasonably efficient, and is the purpose that is consistent with the laws, rules and best interests of the people of the state." Order on Legal Rulings, pgs. 9 – 11.

Accordingly, the ALJ found that WFL's arguments that "wildlife refuge management" is not a beneficial use failed as a matter of law. This Final Order adopts the analysis and conclusions on this issue as provided in the Order on Legal Issues and Proposed Order. *This exception is denied.*

Exception 8: WFL requests that thirteen findings of fact be added to the Final Order. (WFL Exceptions, pgs. 2 – 4.)

Commission Determination: While the findings as WFL presents them may articulate evidence presented by WFL in the course of these proceedings, other evidence in the record outweigh the evidence and testimony presented by WFL. As such, this Final Order reflects the ultimate findings of fact that support the conclusions of law and discussion in the Final Order. *This exception is denied.*

Exception 9: WFL asserts that the Water Resources Department may not issue an instream water right as a permit condition. WFL argues that the Department is using the bypass flow condition on the proposed permit for application S 84222 to circumvent existing statutes and establish an unauthorized instream water right. (WFL Exception, pgs. 4 – 5.)

Commission Determination: The proposed permit for application S 84222 specifies the flow that must be present in the Donner und Blitzen River, Bridge Creek, and Mc Coy Creek. These flows must be present or exceeded before applicant may begin diverting from these water bodies. These bypass flow conditions were added to the draft permit in response to ODFW's concerns regarding redband trout habitat. The flows serve to assure adequate habitat for redband trout and maintain channel integrity resulting from peak flows. These bypass flows are permit conditions and, as such, are enforceable only against the permit holder. These flows are not protected as to any other water right holders. The Proposed Order and Ruling on Legal Issues made the correct finding as to the permissibility and status of these permit conditions. *This exception is denied.*

Exception 10: The Applicant must satisfy the requirements of the Endangered Species Act and the National Wildlife Refuge System Administration Act. WFL argues that if the Department issues "a permit authorizing USFWS to use water in a way that is or could be unlawful under federal law, the Department would be authorizing a wasteful and unreasonable use of Oregon's waters." WFL further argues that obtaining a water right under Oregon state statutes contravenes the Endangered Species Act and the National

Wildlife Refuge System Administration Act Compatibility Analysis and therefore results in an "illegal" use of water that is therefore wasteful, unreasonable and contrary to the public interest. (WFL Exceptions, pg. 7.)

Commission Determination: This argument attempts to import federal law requirement into the state water right process. However, there is nothing in the Department's statutes or rules requiring the Department to hold permit applications pending federal consultation or to review applications for federal law requirements. The Department's review is limited to the review scheme provided in ORS 537.153, and OAR 690-310-0120. The conclusions in the Order on Legal Issues and Proposed Order are adopted in this Final Order. *This exception is denied.*

Exception 11: Applicant must comply with state and local land use planning. WFL argues that the applicant is subject to state water law governing the acquisition of water rights for the Refuge purposes. As such, they argue that water rights may not be issued by the Department unless they are found to be compatible with acknowledged comprehensive land use plans. WFL argues that the use is incompatible with Harney County's comprehensive plan and that the Department should have proceeded under the process for dispute resolution provided in OAR 690-005-0035(5) rather than a contested case hearing.

Commission Determination: With exceptions not relevant here, state agency permitting decisions must be made in compliance with statewide planning goals and in a manner compatible with acknowledged local government comprehensive and land use regulations. ORS 197.180. Agencies may comply with the compliance and compatibility requirements by adopting and implementing a state agency coordination program (or "SAC") that is consistent with ORS 197.180, and that is certified by the Department of Land Conservation and Development (DLCD) under ORS 197.180(4 – 6). The Department's compliance with its certified state agency coordination program constitutes compliance with the requirements of ORS 197.180(1) and OAR 690-030-0000. The Department's SAC program was certified by DLCD and consists of a guidance document and administrative rules set forth in OAR chapter 690, Division 5. The Guide specifically addresses land use coordination with federal agencies, providing that "[a]pplications for water uses on federally owned lands are not subject to land use information requirements as are other applications." Guide at 101-102. Consistent with that direction, the Department maintained, and the ALJ agreed, that the land use information requirement for application S 84222 has been met. This Final Order incorporates the conclusions made in the Order on Legal Issues and Proposed Order. *This exception is denied.*

Exception 12: The Department has not adequately assessed whether the applicant's proposed use of Oregon water is of high public interest. WFL argues that the "public interest," as a standard for reviewing new uses of water means a beneficial use that "includes providing the greatest good for people of the state based on current values, protecting water rights, and conserving water resources for present and future generations." OAR 690-400-0010(12). WFL maintains that the Department did not

adequately analyze this application in light of the public interest in conserving water resources for future generations. WFL argues that the Department has failed to discuss the impact the proposed permit will have on future water uses and thus did not adequately assess whether the public interest in the proposed use is "high." (WFL Exceptions, pgs. 8 – 10.)

Commission Determination: In determining whether a proposed use will impair or be detrimental to the public interest the Department must determine, among other factors, whether water is available for the proposed use. Water availability is defined in the Department's rules and includes a provision stating that surface water must be available at an 80% exceedence level (in other words the amount requested must be determined to be present in the stream at least 8 out of 10 days). Because insufficient water was available for the amount requested under application S 84222, the Department processed the application under an exception to the water availability rule provided in OAR 690-410-0070(2)(a). This exception provides that when a stream is over-appropriated, the Department may still allow additional uses where the "public interest in the use is high" and the use is conditioned to protect instream values. Although the record supports a finding that the proposed use is consistent with OAR 690-410-0070(2)(a), the Proposed Order provides only a brief discussion of the evidence and the reasoning behind the final conclusion. This Final Order while adopting the findings in the Proposed Order, includes a more complete discussion of the evidence in the record. Moreover, the Settlement Agreement between USFWS, Harney County and OWRD and subsequent modifications to Application S 84222 provides an opportunity for additional, future water appropriation in the Donner und Blitzen subbasin of the Malheur Lake Basin. *This exception is denied.*

Exception 13: The proposed beneficial use must be strictly circumscribed to avoid creation of a *de facto* federal reserved right. WFL argues that the proposed beneficial use must be limited to its twelve enumerated uses rather than allowed for the general use of wildlife refuge management. They argue that allowing the use of the water for wildlife refuge management generally is to allow the federal government a *de facto* federal reserved right. (WFL Exceptions, pgs. 10 – 11.)

Commission Determination: WFL did not raise this issue in its protest and so is precluded from judicial review of this issue. ORS 537.170(5). Notwithstanding this untimeliness, a federal reserved water right stems from an act of the federal government in that when the federal government reserves a part of the public domain for a particular purpose it may explicitly or implicitly reserve sufficient unappropriated water to fulfill the purposes of the reservation. In the present case, the federal government is seeking a state water right through the state appropriation system. This may result in the federal government holding a state-issued water right that is subject to cancellation if the permit holder does not comply with the terms of the permit. This Final Order incorporates the Order on Legal Issues and the Proposed Order. *This exception is denied.*

Exception 14: WFL argues that the Proposed Order correctly finds that the proposed water right does not include provisions for storage of water, but is in error to conclude that "standing water" is separate from storage. (WFL Exceptions, pg. 11.)

Commission Determination: WFL did not raise this issue in its protest and so is precluded from judicial review of this issue. ORS 537.170(5). Nothwithstanding this untimeliness, the findings of fact accurately depict that the use of this water is neither for storage for future beneficial use nor for reservoir maintenance but is instead for a regime of moist soil management that includes propagating wetland grasses for habitat and feeding of refuge waterfowl and birds. To accommodate moist soil management, water will be diverted into ponds of different depths that will be allowed to dry out as the season progresses. The permit provides that the use is limited to a rate of 1/40 of a cfs and a duty of three acre-feet per acre irrigated. The permit also contains the standard condition providing that:

> Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This Final Order and permit incorporates the Order on Legal Issues and Proposed Order. *This exception is denied.*

Exception 15: WFL takes exception to the Proposed Order's finding that "[t]he proposed use is not required to be consistent with the Donner und Blitzen River decree," as provided in the Proposed Order, pg. 9. (WFL Exceptions, pg. 11 – 12.)

Commission Determination: WFL did not raise this issue in its protest and so is precluded from judicial review of this issue. ORS 537.170(5). Notwithstanding this untimeliness, the relative rights of claimants on the Donner und Blitzen River was issued by the circuit court in Burns, Oregon, on January 8, 1942. (Donner und Blitzen Decree.) The decree specifies the relative rights of the parties to the decree and is binding on the parties and the water rights adjudicated thereunder. ORS 539.200. The decree also specifies the months in which the irrigation rights under the decree may be exercised, and specifies the duty for these irrigation rights.

An order issuing a new water right on the Donner und Blitzen has no legal effect on the rights established by the Donner und Blitzen Decree or on the decree itself. ORS 539.200. The Department does not dispute that a decree is *res judicata* as to the claims, the parties, and their successors in the decree adjudication. However, the principle does not extend to bind future water right applications.

The Oregon Supreme Court has specifically held that adjudication decrees are not binding on rights that did not exist at the time of the decree:

> A [water right adjudication] decree is not and cannot be considered as operating as an estoppel as to facts which did not occur or rights which did not accrue until after the particular judgment was rendered and which were not involved in the suit in which it was rendered. A decree is not conclusive upon any point or question which from the nature of the case,

> the form of the action, or the character of the pleadings could not have been adjudicated in the suit in which it was rendered; nor as to any matter which must necessarily have been excluded from consideration in the case as being beyond the jurisdiction of the particular court.

Masterson v. Pacific Live Stock Co., 144 Or 396, 404 (1933).

The Donner und Blitzen Decree was limited in application to the water rights recognized therein. The court did not purport to establish a distribution law or conditions of general applicability to all future water rights. Rather, it specifically confined its determination to the claims under review. Likewise, while ORS 539.200 provides that adjudication determinations "shall be conclusive as to all prior rights and the rights of all existing claimants upon the stream," it does not bind or determine the conditions of all future water rights determinations by parties to the decree. As the court recognized, future water rights are not within the subject matter of an adjudication.

Finally, OAR 690-250-0070(1) does not make the decree binding on this water right. Rather, the rule simply provides a default season of use "[w]henever the dates or times of the year within which an irrigation right may be exercised are not specified in decree, permit, certificate, order or basin program." OAR 690-250-0070(1). Here, the permit specifies the times of the year in which the irrigation right may be exercised and the rule is inapplicable. *This exception is denied.*

Exception 16: WFL excepts to the Proposed Order's finding that "[t]he specific numerical rate limits given for each diversion point in the draft permit are not a limit on the total quantity of water that may be diverted from each diversion point provided the total amount of water drawn from all diversion points does not exceed the total amount allowed under the permit." WFL argues that it would be wasteful and prohibited to allow applicant to divert the entire proposed water right of 820.4 cfs from any single point of diversion and that the permit must therefore specify specific numerical limits. (WFL Exceptions, pg. 12.) WaterWatch of Oregon provided a reply to WFL's exception.

Commission Determination: The draft permit for this application specifies that the right be for up to 820.0 cfs from the Donner und Blitzen River. In parenthesis immediately following this description are the maximum amounts of water that can be taken from each point of diversion on the Donner und Blitzen (e.g. 200 cfs from Page Springs Dam, 20 cfs from the New Buckaroo Dam etc.). In addition, the permit specifies that the maximum amount of water that may be taken from tributaries of the Donner und Blitzen; specifically, from Bridge Creek, Mud Creek, Krumbo Creek, McCoy Creek and Kiger Creek. If the total amount of water described on the draft permit is added up, it exceeds 820 cfs. However, at no time may the USFWS withdraw more than a total of 820 cfs from all of these specified sources and points of diversion combined. The amounts listed for each point of diversion or tributary serve as the upper limit for each of these points of

diversion. It is highly unlikely that the USFWS will be able to draw the full 820 cfs from any one of these points of diversions or sources as protestant asserts because each of these sources individually could not yield the full 820 cfs. Rather, a combination of diversions as water is available will serve to yield up to the full amount requested.

It is unclear how the draft permit will "ignore" or otherwise disrupt the regulatory regime of the Donner und Blitzen River. First, this permit does not dictate how other decreed rights on these tributaries should be regulated. Conversely, the decree is not binding upon this water right. Second, this right is the most junior right in the basin and will only receive water after all other rights have been satisfied. The right as it stands serves to grant the Refuge the flexibility it needs to draw a total of 820 cfs from the points of diversions and tributaries listed. The right will not injure existing water rights on the system nor affect the current regulatory scheme of the Diamond Valley tributaries. This Final Order incorporates the findings of the Order on Legal Issues and the Proposed Order.

In addition, WFL did not raise this issue in its protest and so is precluded from judicial review of this issue. ORS 537.170(5). *This exception is denied.*

Exception 17: WFL argues that the conditions such as the bypass flow condition proposed to avoid harm to fish and bird species is speculative and that the flow studies set forth in the Proposed Final Order should be completed prior to issuing a water right. (WFL Exceptions, pg. 12.)

Commission Determination: Concerns regarding the effectiveness of the bypass flow condition was an issue that was also raised by WaterWatch of Oregon and a concern expressed by ODFW in its request for standing. WaterWatch and ODFW resolved this issue by stipulation with USFWS as described in this Final Order. In signing the agreements, these parties stated that the conditions as altered by the stipulated agreement were adequate to address their fisheries concerns. Consequently, because WFL did not enter into these stipulations, they had the burden of proving that the proposed use as conditioned does not protect fisheries. They have provided no evidence to meet this burden and have instead relied on emails that were written by ODFW before it engaged with applicant in the process of writing conditions that would address its concerns regarding the effect of the proposed use on fisheries resources. The Final Order and permit reflect the stipulations between the USFWS, WaterWatch of Oregon, and ODFW which address concerns regarding the effectiveness of the bypass flow condition. *This exception is denied.*

C. Resolution

To defeat the Department's Proposed Final Order, the record must show that the proposed use would impair or be detrimental to the public interest. With regard to those issues of fact for hearing (A.1., A.2., B.1., B.4., B.5., B.6., B.10., B.11., and B. 15) the evidence presented by the protestants was insufficient to rebut the Department's

determination that the proposed use will not impair or be detrimental to the public interest. In the alternative, the parties raising the issues stipulated to conditions that addressed their concerns and simultaneously withdrew their issue. With regard to those issues that were determined on briefing (B.2., B.3., B.8., B.12., B.14., C., D., E and F) these matters have been determined against protestants as a matter of law.

IX. DETERMINATION OF THE PUBLIC INTEREST

Because water is not available (as defined by OAR 690-300-0010(57)) for the proposed use, the Department has not established the public interest presumption described in ORS 537.153, but has made findings that the proposed use will not impair or be detrimental to the public interest. Because the presumption was not established, it is overcome. ORS 537.153(2) (providing that the public interest presumption is a rebuttable presumption that may be overcome by a preponderance of the evidence that "one or more of the criteria for establishing the presumption are not satisfied.")

ORS 537.170(8) provides that if the presumption of the public interest is overcome, then "before issuing a final order, the director, or commission, if applicable, shall make the final determination of whether the proposed use or the proposed use as modified would impair or be detrimental to the public interest by considering" the factors listed in the statute. These factors include:

(a) Conserving the highest use of the water for all purposes, including irrigation, domestic use, municipal water supply, power development, public recreation, protection of commercial and game fishing and wildlife, fire protection, mining, industrial purposes, navigation, scenic attraction or any other beneficial use to which the water may be applied for which it may have a special value to the public.

(b) The maximum economic development of the waters involved.

(c) The control of the waters of this state for all beneficial purposes, including drainage, sanitation and flood control.

(d) The amount of waters available for appropriation for beneficial use.

(e) The prevention of wasteful, uneconomic, impracticable or unreasonable use of the waters involved.

(f) All vested and inchoate rights to the waters of this state or the use of the waters of this state, and the means necessary to protect such rights.

(g) The state water resources policy formulated under ORS 536.295 to 536.350 and 537.505 to 537.534.

A. Analysis of Factors in ORS 537.170(8).

A. Conserving the highest use of the water for all purposes, including irrigation, domestic use, municipal water supply, power development, public recreation, protection of commercial and game fishing and wildlife, fire protection, mining, industrial purposes, navigation, scenic attraction or any other beneficial use to which the water may be applied for which it may have a special value to the public.

In determining the "highest use of the water for all purposes" we have examined the public importance of the Malheur National Wildlife Refuge and have considered the importance of water use to this Refuge. First, it is clear that the Refuge provides an important ecological benefit on a national and even global scale as it provides resting and feeding grounds to migrating birds and breeding ground to several bird species that are considered endangered in other states. It is also clear that the Refuge provides other benefits including public recreation (bird and wildlife viewing, waterfowl hunting and recreational fishing). Its scenic attraction is a part of these recreational uses. The irrigation of wetland grasses and meadows to provide feeding grounds for the bird species on the Refuge is incumbent to the success of the Refuge in fulfilling its purposes.

In the course of these proceedings, Water for Life has argued not so much against these benefits as it has for a different allocation of the water (for unspecified future storage purposes) that would result in economic benefits that they assert would accrue as a result of increased unspecified economic opportunities. Notwithstanding these assertions, there is no evidence in the record that supports a determination of specifically which storage projects are currently planned by Harney County that would be affected by this use nor is there any evidence supporting a finding of what economic benefits these storage projects would yield to Harney County. However, USFWS has agreed to modify application S 84222 to ensure there are opportunities for future allocations of water in the Donner und Blitzen subbasin. These stipulations are part of the USFWS, Harney County, OWRD Settlement Agreement.

We agree with USFWS and OWRD that the proposed use provides recreation, game fishing and wildlife and scenic attraction to the residents and visitors to Harney County. Although testimony reflects that some residents of Harney County believe otherwise it cannot be concluded that such assertions reflect the larger public interest that is served by the Refuge.

B. The maximum economic development of the waters involved.

The applicant and the OWRD take the position that there are many public recreational- and scenic attraction-type benefits that accrue from operation of the Malheur National Wildlife Refuge such as wildlife viewing, bird watching, waterfowl hunting, and recreational fishing. Economic activity on the Refuge includes haying and rake-bunch-haying that yields approximately $280,000 a year. In addition, the USFWS estimates that recreational activities such as wildlife/bird viewing, waterfowl hunting and

recreational fishing total approximately $3.6 million dollars a year. The revenue generated by these recreational and tourist activities benefit Harney County.

Water for Life argues that unspecified economic benefits would accrue by denying this right and thereby allowing opportunities for future storage in the Blitzen Valley. This may be, but Water for Life presented no evidence of future storage projects beyond speculation by witnesses who expressed general opinions but presented no estimates as to economic value that these speculative uses would provide.

In the face of the evidence, speculative future interests can not outweigh a present and quantified economic benefit. A calculus that yielded such result would give no accord to a present interest that is accompanied by economic evidence that defines immediate public benefits. Accordingly, the proposed use represents the maximum economic development of the waters USFWS seeks to appropriate. Again, notwithstanding the record, USFWS has agreed to modify application S 84222 to ensure there are opportunities for future allocations of water in the Donner und Blitzen subbasin. These stipulations are part of the USFWS, Harney County, OWRD Settlement Agreement.

C. The control of the waters of this state for all beneficial purposes, including drainage, sanitation and flood control.

In its protest, Water for Life asserted that the Refuge's management of the Sodhouse Dam resulted in flooding of 120 acres during spring runoff in 1997. Notwithstanding this assertion, no evidence was provided to support this unsworn statement. Rather, evidence in the record indicates that the Refuge's management of the spring runoff will result in less flooding of adjacent lands.

D. The amount of waters available for appropriation for beneficial use.

By the OWRD's own admission, water is not available (as defined in OAR 690-300-0010(57) for the proposed use because unappropriated water at an 80% exceedence level is not available for all months of the proposed season of use. For this reason, OWRD determined that the public interest presumption for this use could not be established. Accordingly, it processesd the application pursuant to OAR 690-310-0120(2)(b) and made the finding in the Proposed Final Order that the proposed use as conditioned would not impair or be detrimental to the public interest.

Notwithstanding that water is not available for the proposed use at an 80% exceedence level for all months requested by USFWS, the OWRD may allow some additional use where the public interest in the use is high and the use is conditioned to protect instream values. OAR 690-410-0070(2)(a). Accordingly, OWRD requested information from the USFWS showing that the application meets the requirements of the rule. Applicant supplied this additional information and the Department issued a

Proposed Final Order finding that the proposed use meets the requirements of OAR 690-410-0070(2)(a). This determination was challenged but unrebutted during the course of the contested case hearing.

Water for Life and Harney County contend that the 820.0 cfs requested is never present in the Donner und Blitzen River. Yet, the evidence indicates to the contrary. Further, as required in the basin program rule for the Malheur Lake Basin, USFWS has provided studies by a qualified hydrologist that show based on gage flow records and statistical analysis, that water is present in the amounts requested during peak events on the Donner und Blitzen River. Such peak events are by their nature short-lived and are not sought nor expected for each month requested. Accordingly, the amount requested is not consistently available but is available at least annually. The assessment that this water is not consistently available, however, does not preclude the beneficial use of such water as is available. Nor does the fact that the water is not consistently available for each month requested lead to the conclusion that the proposed use is inconsistent with OAR 690-512-0040.

In conclusion, water is not available at an 80% exceedence level, but the use may be allowed per the exception provided in OAR 690-410-0070(2)(a). And, although water is not consistently present in the amounts proposed, this fact does not compromise applicant's ability to comply with the basin program rules provided at OAR 690-512-0040.

E. The prevention of wasteful, uneconomic, impracticable or unreasonable use of the waters involved.

In its protest, Water for Life argued that "to appropriate water from a basin that all parties admit is overappropriated is patently wasteful and unreasonable." (Water for Life Protest at pg. 8.) During the course of this proceeding, however, it has been established that water is available during portions of the season of use to fulfill the needs of the Refuge and that amounts less than the full requested amount would still serve a beneficial purpose. As such, allowing the use is not unreasonable. It has also been established that the use will be monitored closely and that regulation of the use for waste, or any other violations of permit conditions, is facilitated by accurate and detailed maps, access to gage flow records and to the Refuge itself.

F. All vested and inchoate rights to the waters of this state or the use of the waters of this state, and the means necessary to protect such rights.

All vested rights to the water of this basin have been examined in the course of determining whether this use will injure such rights. As discussed above, the proposed use will not injure existing water rights. Harney County has argued throughout these proceedings that the proposed use will upset existing water distribution in the Diamond tributaries (Kiger and Cucamonga Creeks) and that the proposed use is therefore inconsistent with the Donner und Blitzen decree. As provided in the discussion above

regarding this issue, the proposed use is not inconsistent with the decree, nor will existing senior rights be regulated in favor of this junior use.

G. The state water resources policy formulated under ORS 536.295 to 536.350 and 537.505 to 537.534.

The proposed use is consistent with the water resources policy formulated under ORS 536.295 to 536.350 in that it is consistent with the Malheur Lake Basin program rules that were formulated according to the policies set in ORS 536.295 to 536.350. ORS 537.505 to 537.534 that relate to management of groundwater are inapplicable in this circumstance.

B. Resolution

The criteria for establishing the presumption under ORS 537.153(2) are not satisfied. Nonetheless, protestants have failed to rebut the findings of the OWRD that, considering the factors of ORS 537.170(8), the proposed use will not impair or be detrimental to the public interest.

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X. ORDER

The protests by Harney County, Harney County Soil and Water Conservation District, Water for Life and WaterWatch of Oregon to application S 84222 are **DENIED.**

Application S 84222 is **APPROVED** as conditioned in the draft permit attached to this final order, and a permit substantially similar to the attached draft permit shall be issued.

DATED this 20 day of ~~January~~ February, 2005.

Dan Thorndike, Chair
Oregon Water Resources Commission

NOTICE: You are entitled to judicial review of this order. Judicial review may be obtained by filing a petition for review within 60 days from the date of service of this order. The date of service is the date on which the order is delivered or mailed. Judicial review, pursuant to the provisions of ORS 536.075, is to the Court of Appeals.

STATE OF OREGON

COUNTY OF HARNEY

RECEIVED
MAR 25 2019
OWRD

DRAFT PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS DRAFT PERMIT IS HEREBY ISSUED TO

U.S. FISH AND WILDLIFE SERVICE
911 NE 11TH AVE.
PORTLAND, OREGON 97232-4181

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: S-84222

PERIOD OF USE: OCTOBER 1 THROUGH MARCH 1

DATE OF PRIORITY: JULY 28, 1999

SOURCE OF WATER: Donner Und Blitzen River, tributary to Malheur Lake, Bridge Creek, Kiger Creek, McCoy Creek, Mud Creek, and Krumbo Creek, tributaries of the Donner Und Blitzen River

PURPOSE OR USE: Wildlife Refuge Management which may include Wildlife Use, Aquatic Life, Wetland Enhancement, Riparian Area Enhancement, Fire Protection, Irrigation Use, Stock Watering, Recreation Use, Construction, Flood Control, Reservoir Maintenance, and Dust Control

The Water Resources Department has determined that the public interest in this use, as described by the type of use, place of use, and point of diversion, is a "High Public Interest" use and is conditioned to protect instream values including habitat for redband trout as set out in the specific permit conditions. OAR 690-410-0070(2)(A).

MAXIMUM RATE/VOLUME

1. MAXIMUM RATE ALLOWED: No more than 820.4 cubic feet per second (CFS). The allowed rate being 820.4 CFS from the Donner Und Blitzen River (200.0 CFS from Page Springs Dam, 20.0 CFS from New Buckaroo Dam, 10.0 CFS from Old Buckaroo Dam, 303.0 CFS from Grain Camp Dam, 166.0 CFS from Busse Dam, 84.0 CFS from Dunn Dam, and 37.0 CFS from Sodhouse Dam), 200.0 CFS from Bridge Creek, 188.0 CFS from Mud Creek, 50.0 CFS from Krumbo Creek, 200.0 CFS from McCoy Creek, and 250.0 CFS from Kiger Creek

2. MAXIMUM VOLUME ALLOWED: The amount of water authorized under this permit, together with the amount of water authorized under the USFWS'S water rights evidenced by certificates 28524, 15198, 15197, and 14367 (or subsequent orders or certificates evidencing

these water rights) is limited to a total volume of 145,000 acre feet (AF) annually (calculated on an annual water year of October 1 through September 30 of each year).

3. The permittee shall designate the acreage, annually, that will be irrigated. The use of the full irrigation duty of three-acre feet per acre for the designated irrigated acres will be assumed. The volume remaining will be available for other uses authorized under this permit.

4. When water is being used for irrigation under this permit, the amount of water used for irrigation, together with the amount secured for irrigation under any other right existing for the same lands, is limited to a diversion of one-fortieth of one cubic foot per second (or its equivalent) and 3.0 acre feet for each acre irrigated.

DONNER UND BLITZEN RIVER POINT OF DIVERSION LOCATIONS:

SODHOUSE DAM: SE 1/4 SE 1/4, SECTION 3, T27S, R31E, W.M.; 856 FEET NORTH & 4 FEET WEST FROM SE CORNER, SECTION 3

DUNN DAM: NW 1/4 SE 1/4, SECTION 15, T27S, R31E, W.M.; 1436 FEET NORTH & 2527 FEET WEST FROM SE CORNER, SECTION 15

BUSSE DAM: NW 1/4 NE 1/4, SECTION 22, T28S, R31E, W.M.; 906 FEET SOUTH & 2094 FEET WEST FROM NE CORNER, SECTION 22

GRAIN CAMP DAM: NE 1/4 NE 1/4, SECTION 26, T29S, R31E, W.M.; 859 FEET SOUTH & 527 FEET WEST FROM NE CORNER, SECTION 26

OLD BUCKAROO DAM: SW 1/4 SW 1/4, SECTION 31, T31S, R32.5E, W.M.; 602 FEET NORTH & 50 FEET EAST FROM SW CORNER, SECTION 31

NEW BUCKAROO DAM: NW 1/4 NW 1/4, SECTION 6, T32S, R32.5E, W.M.; 1356 FEET SOUTH & 381 FEET EAST FROM NW CORNER, SECTION 6;

PAGE SPRINGS DAM: SW 1/4 SW 1/4, SECTION 8, T32S, R32.5E, W.M.; 815 FEET NORTH & 583 FEET EAST FROM SW CORNER, SECTION 8

BRIDGE CREEK POINT OF DIVERSION LOCATION:

NW 1/4 NE 1/4, SECTION 32, T31S, R32.5E, W.M.; 852 FEET SOUTH & 1796 FEET WEST FROM NE CORNER, SECTION 32

MUD CREEK POINT OF DIVERSION LOCATION:

EASTSIDE CANAL: NW 1/4 NE 1/4, SECTION 5, T32S, R32.5E, W.M.; 325 FEET SOUTH AND 1329 FEET WEST FROM NE CORNER, SECTION 5

MCCOY CREEK POINT OF DIVERSION LOCATION:

MCCOY CREEK STRUCTURE: NW 1/4 SW 1/4, SECTION 21, T29S, R32E, W.M.; 2260 FEET SOUTH & 960 FEET EAST FROM NW CORNER, SECTION 21

KIGER CREEK POINT OF DIVERSION LOCATION:

NW 1/4 NW 1/4, SECTION 21, T29S, R32E, W.M.; 98 FEET SOUTH & 1340 FEET WEST FROM NE CORNER, SECTION 21

KRUMBO CREEK POINT OF DIVERSION LOCATION:

KRUMBO POND DIKE: NW 1/4 NE 1/4, SECTION 24, T30S, R31E, W.M.; 635 FEET SOUTH & 1779 FEET WEST FROM NE CORNER, SECTION 24

THE PLACE OF USE IS LOCATED AS FOLLOWS:

NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 34
TOWNSHIP 26 SOUTH,
RANGE 31 EAST, W.M.

SE 1/4 NE 1/4
ALL SE 1/4
SECTION 25

ALL NE 1/4
SECTION 36
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

NE 1/4 NW 1/4
NW 1/4 NW 1/4
SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 2

ALL
SECTION 3

ALL
SECTION 4

SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 8

ALL
SECTION 9

ALL
SECTION 10

NW 1/4 NW 1/4
SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 11

NW 1/4 NW 1/4
SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 14

ALL
SECTION 15

ALL
SECTION 16

ALL NE 1/4
NE 1/4 NW 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 17

SE 1/4 SW 1/4
ALL SE 1/4
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

NW 1/4 NW 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
SECTION 23

ALL NW 1/4
ALL SW 1/4
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

ALL
SECTION 33

ALL
SECTION 34

ALL NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 35
TOWNSHIP 27 SOUTH,
RANGE 31 EAST, W.M.

ALL NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

ALL NE 1/4
ALL NW 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 6

NE 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 7

ALL
SECTION 8

ALL
SECTION 9

NW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
SECTION 10

ALL NW 1/4
ALL SW 1/4
SECTION 15

ALL
SECTION 16

ALL
SECTION 17

NE 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 18

NE 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

SW 1/4 NW 1/4
ALL SW 1/4
SECTION 23

SW 1/4 NE 1/4
NW 1/4 NW 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 25

ALL
SECTION 26

ALL
SECTION 27
ALL
SECTION 28

ALL NE 1/4
NE 1/4 NW 1/4
NW 1/4 NW 1/4
SE 1/4 NW 1/4
NE 1/4 SW 1/4
ALL SE 1/4
SECTION 29

NE 1/4 NE 1/4
SE 1/4 NE 1/4
SECTION 32

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
ALL SE 1/4
SECTION 33

ALL
SECTION 34

ALL
SECTION 35

NE 1/4 NE 1/4
NW 1/4 NE 1/4
SW 1/4 NE 1/4

ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 36
TOWNSHIP 28 SOUTH,
RANGE 31 EAST, W.M.

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 1

ALL
SECTION 2

ALL
SECTION 3

NE 1/4 NE 1/4
NW 1/4 NE 1/4
SE 1/4 NE 1/4
SECTION 4

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 10

ALL
SECTION 11

NW 1/4 NE 1/4
SW 1/4 NE 1/4
SE 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 12

ALL
SECTION 13
ALL
SECTION 14

ALL NE 1/4
NE 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SE 1/4
SECTION 15

NE 1/4 NE 1/4
SECTION 22

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
ALL SE 1/4
SECTION 23

ALL NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 24

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
NW 1/4 SW 1/4
SE 1/4 SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 25

ALL NE 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 26
SE 1/4 SW 1/4
NE 1/4 SE 1/4
SW 1/4 SE 1/4

SE 1/4 SE 1/4
SECTION 34
NW 1/4 NE 1/4
SW 1/4 NE 1/4
NE 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
SECTION 35
TOWNSHIP 29 SOUTH,
RANGE 31 EAST, W.M.

SW 1/4 NE 1/4
SE 1/4 NE 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 7

NW 1/4 SW 1/4
SW 1/4 SW 1/4
SE 1/4 SW 1/4
SW 1/4 SE 1/4
SECTION 8

SW 1/4 NW 1/4
SE 1/4 NW 1/4
SECTION 15

ALL NE 1/4
NE 1/4 NW 1/4
SW 1/4 SW 1/4
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
NW 1/4 SW 1/4
SE 1/4 SW 1/4

ALL SE 1/4
SECTION 19

ALL
SECTION 20

ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 21

NW 1/4 NE 1/4
NE 1/4 NW 1/4
NW 1/4 NW 1/4
SECTION 29
NE 1/4 NE 1/4
SECTION 30
TOWNSHIP 29 SOUTH,
RANGE 32 EAST, W.M.

SW 1/4 SW 1/4
SECTION 2

ALL NE 1/4
NE 1/4 NW 1/4
SE 1/4 NW 1/4
NE 1/4 SW 1/4
SW 1/4 SW 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 3

ALL
SECTION 10

ALL NW 1/4
ALL SW 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 11

SW 1/4 SW 1/4
SECTION 12

SW 1/4 NE 1/4
SE 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 13

ALL NE 1/4
NE 1/4 NW 1/4
NW 1/4 NW 1/4
SE 1/4 NW 1/4
NE 1/4 SW 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 14

NE 1/4 NE 1/4
NW 1/4 NE 1/4
SW 1/4 NE 1/4
NE 1/4 NW 1/4
SE 1/4 NW 1/4
NE 1/4 SW 1/4
SW 1/4 SW 1/4
SE 1/4 SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 15

NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 21

ALL
SECTION 22

NE 1/4 NE 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 23

ALL NE 1/4
NE 1/4 NW 1/4
NW 1/4 NW 1/4
SE 1/4 NW 1/4
SECTION 24

NW 1/4 NW 1/4
SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 26

ALL
SECTION 27

NE 1/4 NE 1/4
SW 1/4 NE 1/4
SE 1/4 NE 1/4
ALL SE 1/4
SECTION 28

ALL NE 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 33

ALL
SECTION 34

NW 1/4 NE 1/4
SW 1/4 NE 1/4
SE 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 35
TOWNSHIP 30 SOUTH,
RANGE 31 EAST, W.M.

ALL SW 1/4
ALL SE 1/4
SECTION 18

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
NW 1/4 SW 1/4

ALL SE 1/4
SECTION 19

ALL NW 1/4
ALL SW 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 20

SW 1/4 SW 1/4
SE 1/4 SW 1/4
SW 1/4 SE 1/4
SECTION 27

NW 1/4 NW 1/4
SE 1/4 NW 1/4
NW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 28

ALL NW 1/4
SECTION 29
NE 1/4 NE 1/4
SECTION 30

NE 1/4 NE 1/4
SECTION 33
NE 1/4 NE 1/4
NW 1/4 NE 1/4
NW 1/4 NW 1/4
SECTION 34
TOWNSHIP 30 SOUTH,
RANGE 32 EAST, W.M.

NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 1

NE 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SE 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 12

ALL NE 1/4
NE 1/4 SW 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 13

SE 1/4 SE 1/4
SECTION 23

ALL NE 1/4
NE 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 24

ALL
SECTION 25

NE 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 26

NE 1/4 NE 1/4
SW 1/4 NE 1/4
SE 1/4 NE 1/4
NE 1/4 SW 1/4
SE 1/4 SW 1/4
ALL SE 1/4
SECTION 35

ALL
SECTION 36
TOWNSHIP 31 SOUTH,
RANGE 32 EAST, W.M.

SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 3

SW 1/4 NE 1/4
SE 1/4 NE 1/4

SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 4

SW 1/4 NE 1/4
SE 1/4 NE 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 5

SW 1/4 NE 1/4
SE 1/4 NE 1/4
SW 1/4 NW 1/4
SE 1/4 NW 1/4
ALL SW 1/4
ALL SE 1/4
SECTION 6

ALL
SECTION 7

ALL
SECTION 8

NE 1/4 NE 1/4
NW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
SECTION 9

NW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
SECTION 16

ALL
SECTION 17

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SECTION 18

ALL
SECTION 19

ALL
SECTION 20

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 21

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
ALL SW 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 33
TOWNSHIP 31 SOUTH,
RANGE 32.5 EAST, W.M.

ALL
SECTION 1

ALL NE 1/4
NE 1/4 SE 1/4
SE 1/4 SE 1/4
SECTION 2

NE 1/4 NE 1/4
NW 1/4 NE 1/4
SE 1/4 NE 1/4
SECTION 11

ALL NE 1/4
ALL NW 1/4
NE 1/4 SE 1/4
NW 1/4 SE 1/4
SECTION 12
TOWNSHIP 32 SOUTH,
RANGE 32 EAST, W.M.

NW 1/4 NE 1/4
SW 1/4 NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
NW 1/4 SW 1/4
NW 1/4 SE 1/4
SECTION 4

ALL NE 1/4
ALL NW 1/4
ALL SW 1/4
NE 1/4 SE 1/4
NW 1/4 SE 1/4
SW 1/4 SE 1/4
SECTION 5

ALL
SECTION 6

ALL NE 1/4
ALL NW 1/4
NE 1/4 SW 1/4
NW 1/4 SW 1/4
NE 1/4 SE 1/4
NW 1/4 SE 1/4
SECTION 7

NW 1/4 NE 1/4
NE 1/4 NW 1/4
NW 1/4 NW 1/4
SW 1/4 NW 1/4
NW 1/4 SW 1/4
SW 1/4 SW 1/4
SECTION 8
TOWNSHIP 32 SOUTH,
RANGE 32.5 EAST. W.M.

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to any meter or measuring device. Where the meter or measuring device is located within a locked structure, the watermaster shall be given access upon reasonable notice.

Within 1 year of permit issuance, the permittee shall develop and submit a Water Quality Monitoring Plan. The Director may approve an extension of this timeline to complete the required Plan. The Plan shall be reviewed and approved by the Water Resources Department in conjunction with the Department of Environmental Quality.

In the event of a request for a change in point of appropriation, an additional point of appropriation or alteration of the appropriation facility associated with this authorized diversion, the quantity of water allowed herein, together with any other right, shall not exceed the capacity of the facility at the time of perfection of this right.

Flow Conditions

Before certification of this permit, the permittee shall conduct a study that determines flow levels and habitat improvement measures during the period of use covered by this permit (October 1 through March 1) necessary for maintaining and restoring Redband trout and its habitats in the Donner und Blitzen River and its tributaries within the Malheur National Wildlife Refuge. The flow study must be conducted collaboratively with the Oregon Department of Fish and Wildlife at all levels of the study development, including study design, analysis and determination of new flow levels. The flow study shall include an analysis of whether peak flows would benefit Redband trout and their habitat within the Malheur National Wildlife Refuge and, if so, determine location, duration, and amount of necessary peak flow levels. The necessary peak flows, if any, will be set within the limits of the Refuge's infrastructure. The flow levels determined by the study, including any peak flows, will become a bypass condition in the permit and subsequent certificate. In the interim the following three bypass flow conditions will apply.

1. During diversions under this permit from the Donner und Blitzen River, bypass flows in the Donner und Blitzen River within the Malheur National Wildlife Refuge must be at: 43.0 cubic foot per second (CFS) during the month of October, 45.0 CFS during the month of November, 45.0 CFS during the month of December, 54.0 CFS during the month of January, and 52.0 CFS during the month of February. The flows shall be

measured to ensure that diversions are consistent with the bypass flow conditions. Except that, when flows in the Donner und Blitzen River are at or below the prescribed bypass flow levels, up to 5.0 CFS may be diverted from the Donner und Blitzen River to East Canal as measured directly below the diversion point for the East Canal.

2. During diversions under this permit from Bridge Creek, bypass flows in Bridge Creek from the East Canal to the Donner und Blitzen River must be at: 12.0 CFS during the month of October, 11.0 CFS during the month of November, 11.0 CFS during the month of December, 11.0 CFS during the month of January, and 11.0 CFS during the month of February, or the actual flow at U.S. Fish and Wildlife Service gage number 357004 on Bridge Creek (formerly U.S. Geological Survey gage number 10397000), whichever is less. These flows shall be measured directly above the confluence of Bridge Creek and the Donner und Blitzen River.

3. During diversions under this permit from McCoy Creek, bypass flows in McCoy Creek within the Malheur National Wildlife Refuge must be at 5.0 CFS.

The permittee shall provide adequate and effective upstream and downstream fish passage past all diversions associated with this permit on the Donner und Blitzen River and its tributaries, as required by the Oregon Department of Fish and Wildlife. Oregon Department of Fish and Wildlife fish passage criteria must be used unless the U.S. Fish and Wildlife Service has developed more protective criteria specific to redband trout and other native fish species that occur in the Donner und Blitzen basin. Oregon Department of Fish and Wildlife must be consulted on design and during installation of fish passage facilities.

The permittee shall install and maintain fish screening as required by the Oregon Department of Fish and Wildlife. Oregon Department of Fish and Wildlife fish screening criteria must be used unless the permittee has developed more protective criterial specific to redband trout and other native fish species occurring in the Donner und Blitzen basin. Oregon Department of Fish and Wildlife must be consulted on design and during installation of fish screens.

The permittee shall meet state and federal water quality standards and requirements.

The permittee shall implement the provisions concerning measurement and reporting of flows contained in the existing measurement and reporting plan developed by the permittee and approved by the Oregon Water Resources Department. This plan is titled "Water Measuring Plan for Malheur National Wildlife Refuge in Compliance with ORS 537.099: Water Use Reporting for Government Entities," September, 1996. The plan was approved by the Water Resources Department in a letter dated November 4, 1996.

Water Sharing Subordination - Direct Diversion

If bypass flows as measured at the McCoy Creek gaging station are met, then the permittee may divert up to 20.0 CFS from McCoy Creek. Thereafter, for purposes of water regulation, so long as at least the bypass flows plus 20.0 CFS is passing the McCoy Creek gaging station, the Diamond Valley portion of this right shall not have priority over water in excess of this amount up to 20.0 CFS, not to exceed 6,000

AF, of junior priority date water rights as may be authorized by OWRD. Thereafter, the permittee may take the remaining water as it is entitled under this right.

Large Storage Facility

1. In addition to the subordination above, this permit shall be subordinate, for purposes of water regulation, to junior priority date water rights as may be authorized by OWRD to store water in reservoirs greater than 9.2 AF within the Diamond Valley, not to exceed a total of 600 AF for all reservoirs.

2. This permit shall be subordinate as described in (1) above only if: (a) the junior priority date reservoir(s) will be on tributaries of the major streams (Kiger and McCoy Creek) and/or on the minor tributaries of the Diamond Valley (Cucamonga and Swamp Creeks); and (b) the applicant(s) and permittee will coordinate to condition such a new reservoir permit to ensure the Refuge reservoir and obligations including the bypass flows are protected.

Stockwater - Direct Diversions

In addition to the subordinations above, this permit shall be subordinate, for purposes of water regulation, to junior priority water rights as may be authorized by the OWRD to use direct flow diversions into existing ditches, for uses in existence as of December 31, 2004, for livestock purposes during the period October 1 to March 1 of each year.

Existing Stockwater Ponds/Reservoirs

In addition to the subordinations above, this permit shall be subordinate, for purposes of water regulation, to junior priority water rights as may be authorized by the OWRD to store water for livestock or wildlife purposes so long as: the storage permit is for 9.2 AF or less; the pond/reservoir is an existing un-permitted use that is otherwise not authorized as an exempt use or pond, constructed prior to December 31, 2004; and the application for the livestock or wildlife pond/reservoir is submitted to OWRD prior to December 31, 2009.

Future Stockwater Ponds/Reservoirs

1. In addition to the subordinations above, for purposes of water regulation, this permit shall not have priority over junior priority date water rights as may be authorized by the OWRD to store water for livestock and wildlife purposes in storage facilities which are less than 9.2 AF in size, up to a total of 700 AF of water subject to the following limitations:

   (i) Up to two hundred and twenty (220) AF from the Diamond Tributaries.
   (ii) Up to one hundred and fifty (150) AF from the Upper Donner und Blitzen River (above Page Springs Dam), Mud Creek, and Bridge Creek basins.
   (iii) Up to three hundred and thirty (330) AF from all other basins within the Donner und Blitzen subbasin.

This being a combined total from all basins 700 acre feet.

2. This permit shall be subordinate as described in (1) above only if such storage facilities will be widely distributed throughout each basin and the permittees' ability to ensure protection of Malheur National Wildlife Refuge resources is maintained. The intent of this subordination is to ensure that the resources of the Malheur National Wildlife Refuge are protected while providing water users the opportunity to submit permit applications for new storage facilities.

SPECIFIC CONDITIONS

After permit and associated certificate issuance, no proposed subsequent use of any portion of this water right, or any water right derived from this water right, shall occur unless the Department has determined, following public notice and opportunity for comment, that the proposed subsequent use, as described by the type of use, place of use and point of diversion is a "high public interest" use and is conditioned to protect instream values, including habitat for redband trout.

Livestock watering directly from a stream does not establish a right to make a call against any junior water users holding water rights nor may livestock watering uses be regulated in favor of this or any other right. This condition is a statement of OWRD's policy in regards to livestock watering as articulated in the Field Enforcement Manual. This policy applies to all water rights, whether or not the water right includes this condition. This condition will be in effect so long as the policy is in effect.

STANDARD CONDITIONS

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flows.

Actual construction work shall begin within one year from issuance of the permit. Complete application of the water to the use shall be made on or before October 1, 2009. Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE).

Issued _____, 2005

DRAFT - THIS IS **NOT** A PERMIT

_____
Phillip C. Ward, Director
Water Resources Department

CERTIFICATE OF SERVICE

I hereby certify that on the 9th day of February 2005, I served a true copy of the FINAL ORDER INCORPORATING SETTLEMENT AGREEMENT, DENYING PROTESTSAND APPROVING APPLICATION S-84222, and a true copy of permit 54164, by mailing certified in a sealed envelope, with postage prepaid a copy thereof addressed as follows:

Ronald S. Yockim
Attorney at Law
548 SE Jackson St., Suite 7
P.O. Box 2456
Roseburg, Oregon 97470

Shelly S. McIntyre
Department of Justice
1515 SW Fifth Ave.
Portland, Oregon 97201

Schroeder Law Offices, P.C.
1915 NE 39th Ave.
P.O. Box 12527
Portland, Oregon 97212

Harney County SWCD
P.O. Box 848
Hines, Oregon 97738

Karen Russell
WaterWatch of Oregon
213 SW Ash, Suite 208
Portland, Oregon 97204

Barbara Scott-Brier
US Department of Interior
500 NE Multnomah St., Suite 607
Portland, Oregon 97232

and by regular US mail, postage prepaid to:

Judge Steven E. Grasty
Harney County Court
450 North Buena Vista
Burns, Oregon 97720

Emilie Wolff
Executive Director
Water For Life, Inc.
P.O. Box 12248
Salem, Oregon 97309

Rick Kepler
ODFW
3406 Cherry Ave NE
Salem, Oregon 97303

Michael Eberle
Department of Interior
U.S. Fish and Wildlife Service
911 NE 11th Ave.
Portland, Oregon 97232-4181

Shannon O'Fallon
Department of Justice

Cindy Smith
Cindy Smith
Oregon Water Resources Department

Exhibit D

Hydrology and Water Quality at Malheur National Wildlife Refuge

Tim Mayer, Rick Roy, Tyler Hallock, Kenny Janssen
U.S. Fish and Wildlife Service

INTRODUCTION

Malheur National Wildlife Refuge (NWR) is located in Harney Basin in southeastern Oregon (Figure 1). The refuge encompasses 187,000 acres of open water, wetlands, springs, riparian areas, irrigated meadows and grain fields, and uplands. The original executive order in 1908 protected Harney, Mud, and Malheur Lakes. The refuge was expanded to include the Blitzen Valley in 1935 and the Double-O Unit in 1941. The refuge serves as a major feeding, resting, and nesting area for migratory waterfowl, shorebirds, marsh birds, colonial nesting waterbirds, raptors, and passerine bird species. Water and marsh habitat management on the refuge benefit large numbers of breeding and migrating birds including ducks, geese, swans, colonial nesting species, and other marsh and shorebirds. The refuge also supports large numbers of greater sandhill cranes.

The value of the habitat on the refuge is largely dependent on the availability and management of water resources. Much of the water management on the refuge occurs in the Blitzen Valley, where the infrastructure for water management exists. The Donner and Blitzen (Blitzen) River begins on Steens Mountain and flows north through the Blitzen Valley unit of the refuge and into Malheur Lake (Figure 2). A system of dikes, canals, drains, and water control structures was developed in the early 1900s to facilitate grazing and farming. Twenty miles of the river was channelized and straightened at the same time. The water distribution system still exists and is used by the refuge to manage water in the Blitzen Valley. The area represents the most intensively managed and most productive habitat on the entire refuge, especially because the habitat value of the lakes has declined so greatly with the introduction and proliferation of carp.

Practices to improve and manage habitat on the refuge include vegetation manipulation, through haying, burning, flooding, irrigation, farming and grazing, and water management, through flooding and drainage. Much of the irrigation on the refuge is accomplished by pooling water behind a series of dams along the Blitzen River within the refuge. The water is then diverted via canals into numerous meadows and wetlands and can return to the Blitzen River by surface sheet flow, return flow ditches or pipes, or subsurface seepage. Irrigation occurs from March through mid to late July in most of the Blitzen Valley.

In addition to irrigation, the refuge manages meadow habitat through haying and grazing to provide short-grass feeding habitat or dense nesting cover for greater sandhill cranes and other migratory birds. In August, after the cessation of irrigation, local ranchers (permittees) hay the meadows. The premittees either remove the hay to feed livestock or stack it into small piles or windrows in the hay meadows. Cattle are then grazed in hayed meadows during the fall and winter. Annually, there are up to 40,000 AUMs on Malheur NWR. The method of providing forage for cattle is referred to as rake-bunch grazing. In spring, the young grass shoots and invertebrates associated with the rakebunch grazing meadows are the preferred food for cranes, geese, ducks, and shorebirds migrating through the refuge.

The Blitzen and its tributaries also support a substantial population of the Great Basin redband trout, a native rainbow trout/steelhead that inhabits lakes and streams east of the Cascade Mountains. The Great Basin redbands have been isolated in closed basins for several thousand years (USFWS 2000). The species was petitioned for listing based on habitat degradation that resulted from livestock grazing, irrigation, stream channel manipulations, and reduced riparian vegetation (all practices or conditions that occur on the refuge). The USFWS determined that listing was not warranted at the time (USFWS 2000). However, there is still considerable interest in and concern for the status of this species.

Refuge management practices designed to manage water and migratory bird habitat have the potential to adversely impact redband trout through water quality degradation. Irrigation and water management on the refuge may decrease flows, exacerbate high water temperatures, reduce dissolved oxygen concentration, increase turbidity, increase nutrient loading, and degrade fish habitat. Nutrients, fecal coliforms and other pathogens associated with cattle manure, hayed meadows, and wetlands may enter the Blitzen River via irrigation return flows. These pollutants may decrease water quality (e.g., increased water temperatures, reduced DO, increased algal blooms) and impact native fish species.

The Blitzen River is a 303(d) listed stream for water temperature, dissolved oxygen, and turbidity. Because water quality is impaired with respect to state standards, the entire Blitzen watershed must comply with Total Maximum Daily Loading (TMDL) criteria as specified within the Clean Water Act. The TMDL for the Blitzen River is scheduled to be completed by 2010. A TMDL study may be conducted by the U.S. Environmental Protection Agency and Oregon State Department of Environmental Quality (DEQ) in the future. After TMDL criteria are established, Malheur NWR must monitor and meet regulatory standards for discharges and pollutant loading into the Blitzen River. The refuge will improve water quality by employing best management practices (BMPs), which will eventually be used to establish TMDL water quality standards for the Blitzen Valley watershed.

PREVIOUS STUDIES

There are several previous hydrology and water quality studies for the Malheur NWR area that will be mentioned here briefly. Most of these studies have focused on the area upstream of the refuge or on Malheur Lake itself. Rinella and Schuler (1992) conducted a reconnaissance investigation of water quality, sediment, and biota to determine if irrigation drain water was causing harmful effects of human health or fish and wildlife resources. Although they found high concentrations of As, Bo, and Hg in Malheur Lake samples and in some biological samples, they did not believe there were problems associated with agricultural drainage from the Blitzen River Basin. The authors did report that the concentration of dissolved solids and inorganic constituents, including N and P, increased downstream in the Blitzen River.

In the 1990s, concern became heightened for Great Basin redband trout. In response to a petition for listing, the FWS prepared a status review of the fish (USFWS, 2000). Factors given as contributing to the demise of the fish included warm temperatures, poor water quality, habitat degradation, irrigation diversions, limited fish passage at dams, and the introduction of carp in the Blitzen River and Malheur Lake. The increased concern for the fish and the river produced several studies looking at water quality and water temperature in the Blitzen River and tributaries.

Roy et al. (2001) measured water temperatures, turbidity, pH, and dissolved oxygen at several sites along the Blitzen River and Bridge Creek through the refuge in the summer of 1999. They reported a general increase in water temperatures and conductivity downstream in the refuge, with all Blitzen River sites and the two downstream Bridge Creek sites exceeding the state temperature standard (17.8°C at the time). Turbidity was generally low, but was increased during manipulation of water control structures on the refuge. pH appeared to decrease downstream through the refuge and was always between 7.0 and 9.0. Dissolved oxygen decreased downstream as well, and frequently fell below the state criteria of 6.5 mg/L. Dissolved oxygen was consistently lowest at Sodhouse Lane, the most downstream site on the refuge.

Watershed Sciences (2002) conducted a Forward Looking Infrared (FLIR) survey of water temperatures on Bridge Creek and the Little Blitzen River on August 17, 1999. Although Bridge Creek is a spring-fed stream, the channel flows through a very low-gradient, 2-mile section known as the Bridge Creek Canal, between East Canal and the mouth of Bridge Creek. Water is backed up in this section with a diversion dam and water temperatures increased considerably through this reach. Water temperatures in Bridge Creek were about 12°C six miles upstream of the confluence with the Blitzen River, 18°C at the upstream end of Bridge Creek Canal, and 22°C at the mouth of Bridge Creek.

One more study that we will discuss here is the study of wetland water quality impacts at Lower Klamath NWR (Mayer, 2005). This study examined the effect of wetland water management on water quality at Lower Klamath NWR in south central Oregon. Based on nutrient loads, the study reported that the refuge wetlands increased nutrient concentrations relative to inflows, but decreased nutrient mass loads overall. Nitrogen was removed more effectively than phosphorus. Seasonally flooded wetlands retained less P than permanently flooded wetlands, perhaps because of the annual drying cycle and the decomposition of annual vegetation. Dissolved inorganic nitrogen was removed most effectively in refuge wetlands, possibly through nitrification and denitrification. The study is relevant because of the similarity in habitats and water management between Lower Klamath NWR and Malheur NWR and the possible parallels in water quality impacts.

STUDY GOALS

The goal of this study is to assess the water quality impacts associated with refuge water and habitat management (irrigation of hay and rake-bunch meadows, grazing, surface and subsurface return flows from both wetlands and agricultural fields, dam operations) and to assess BMPs that may be used to address water quality concerns. In addition, as a term and condition to the refuge's new water right permit (P 54164), the refuge must within one year of permit issuance, prepare and submit for approval a Water Quality Monitoring Plan to OWRD and ODEQ. This study quantifies the extent of water degradation associated with current management practices on the refuge. This information will allow the refuge to prepare a water quality monitoring plan for future monitoring and to evaluate and implement BMPs that provide habitat for wildlife (migratory birds and redband trout), improve water quality and aquatic habitat on the refuge, and comply with Oregon law.

The refuge could use several BMPs to potentially water quality concerns. For example, water could be managed more efficiently to reduce return flows from wetland units or surface sheet flows. However, this may increase the proportion of subsurface seepage return flow to the river, which is typically lower in dissolved oxygen and may contain elevated concentrations of nutrients (Mayer, 2005). The effects of return flows may be ameliorated by keeping more flow in the mainstem of the river. Head gates and water control structures could be re-engineered to more efficiently manage water for meadow and wetland management. Water temperature impacts from wetland return flows could be reduced by holding water longer and allowing more water to evaporate rather than drain. Slower drawdowns in wetlands also may reduce turbidity of return flows to the river. Increased efforts to control carp may improve water quality because their feeding and spawning habits increase water turbidity.

River and riparian restoration represents a very important BMP for improving water quality. In 2002, the refuge restored 3.5 miles of instream and riparian habitat, less than one tenth of the entire reach of river on the refuge. Much of the riparian habitat is extremely poor (shallow & wide stream channel, limited willows, steep/bare banks, few deep holes, little habitat complexity). The refuge could conduct much more extensive instream/riparian rehabilitation to increase shading of the river to reduce direct heating from the sun. Riparian rehabilitation could potentially help keep river water cooler, reduce bank sloughing/erosion and improve habitat. Before any of these BMPs could be effectively employed, the refuge requires knowledge of the relative impacts of the various water and habitat management practices used on the refuge.

The study proposes to focus on hydrology and water quality measurements as well as associated impacts to biota. Many of the water quality concerns associated with refuge management practices are closely associated with hydrology. By focusing on both water quantity and water quality, we can most effectively evaluate water quality impacts associated with refuge management practices. Using flow measurements as well as chemical data, we can calculate water budgets and estimate water use on the refuge, calculate mass balances and nutrient loading from refuge habitats, employ simple mixing models, and develop a more sophisticated understanding of water quality on the refuge.

Given the size of the Blitzen Valley, monitoring the entire refuge would be a formidable challenge. The approach we use is to monitor a small section of the refuge and extrapolate the results from this study area to the entire refuge. The area we focus on primarily is the Frenchglen area of the Malheur NWR. It is possible to do a complete water budget of all inflows and outflows for this area. We collected flow measurements and water quality samples from a number of locations along the river, in canals and return flows, and in wetlands, to document overall water quality changes occurring in the system. We monitored temperature continuously at several locations along the river and in the surrounding area as well. We began monitoring with the irrigation season in the spring and continued it until the fall, for two seasons in a row.

STUDY REPORTS AND ORGANIZATION

We present the results from this study in eight reports, organized into four separate sections, all written to be read independently. The first section consists of three reports that examine historical flow information from the Blitzen River, Bridge Creek, and springs on the refuge. The mean and distribution of flow and runoff for various periods are calculated and summarized for both river systems. The accuracy of NRCS runoff forecasts for the Blitzen is evaluated. Long-term trends in flows over the 60+ years of record are examined too. Estimates are developed for inflow from various springs on or near the refuge. This section addresses the question "How much water has the refuge typically received in the past?" The three reports included in this first section are entitled:

Historical Flows, Summary Statistics, and Streamflow Forecasts for the Blitzen River near Frenchglen, Oregon (USGS Site No. 10396000)

Historical Flows and Summary Statistics for Bridge Creek above East Canal, Oregon

Estimated Spring Inflow to the Frenchglen Area of Malheur National Wildlife Refuge

The second section consists of one report that develops water budgets for several different wetlands and areas on the refuge. Consumptive use is estimated and compared for different habitats. The timing of water needs is examined for various areas and habitats. The section addresses the question "How much water does the refuge typically need and when does it need it?" The report included in this second section is entitled:

Water Budgets, Net Inflow, and Consumptive Use Estimates for Malheur National Wildlife Refuge

The third section examines the water quality impacts of water management on the refuge in three reports. Water temperature in the Blitzen River is identified as one of the major water quality issues of concern on the refuge. The first report in this section analyzes the causes of elevated temperatures and discusses modeling results and management alternatives to improve water temperatures. The second report examines water quality conditions and nutrient budgets in the Blitzen River and surrounding areas. The third report focuses water quality and nutrient loading in a permanently-flooded wetland, West Knox Pond. The section addresses the primary question of the study: "What are the water quality impacts of refuge water management?" The reports included in this section are entitled:

Blitzen River Water Temperature Monitoring

Water Quality in the Blitzen River Valley at Malheur National Wildlife Refuge

Water Quality in West Knox Pond at Malheur National Wildlife Refuge

The final section discusses the management implications of the results from the study. The general findings pertaining to water quality are presented and management strategies addressing these issues are discussed. The section addresses the question "What management actions can be implemented to mitigate water quality problems on the refuge?" The report in this section is entitled:

Management Strategies for Addressing Water Quality Issues at Malheur National Wildlife Refuge

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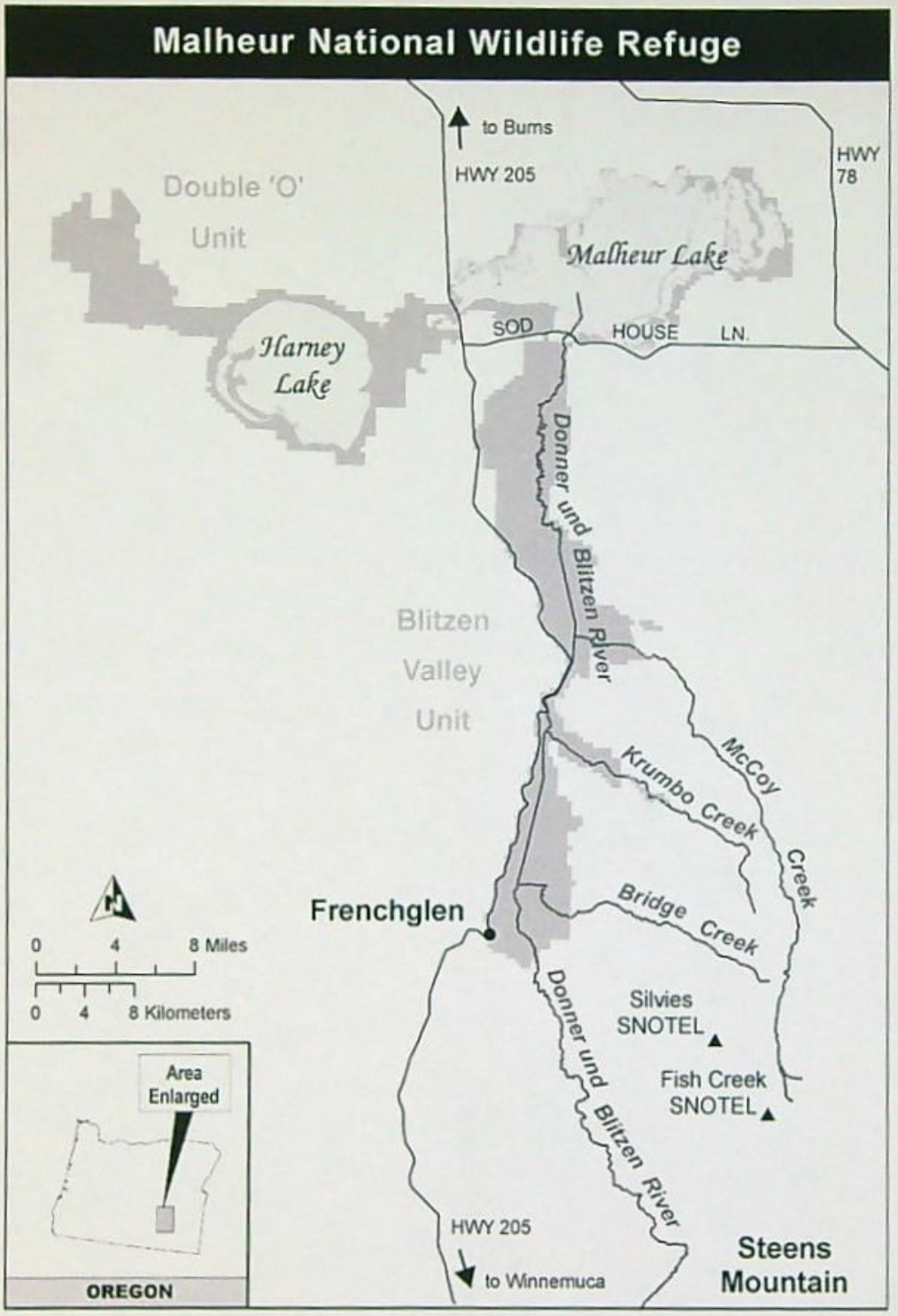

Figure 1. Map showing general location of Malheur NWR with the refuge boundary and units, the SNOTEL sites mentioned in this study, and several major landmarks and geographic features.

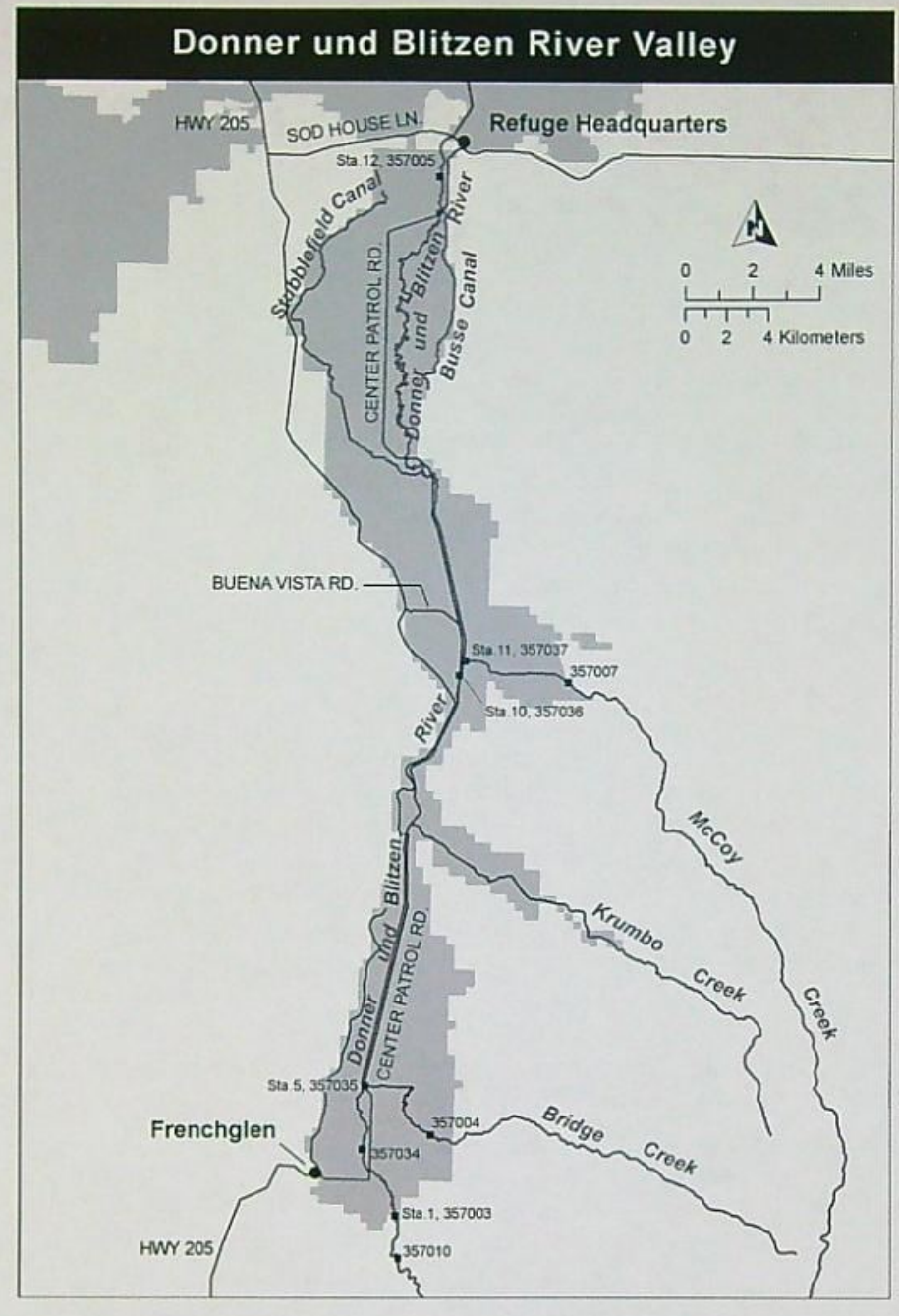

Figure 2. Map of Blitzen River Valley showing rivers and creeks, study monitoring sites, and several major landmarks and geographic features.

Historical Flows, Summary Statistics, and Streamflow Forecasts for the Blitzen River near Frenchglen, Oregon (USGS Site No. 10396000)

Tim Mayer, Kenny Janssen, Rick Roy, Tyler Hallock
U.S. Fish & Wildlife Service

The Donner und Blitzen (Blitzen) River is the main source of water for the Blitzen Valley unit of Malheur NWR (Figure 1). It enters the refuge at the southern boundary near Page Springs Campground, 3.5 miles southeast of Frenchglen, Oregon. The USGS has monitored flows about one mile upstream of Page Springs Campground continuously since 1938. The purpose of this report is to provide information and analysis on the historical flows in the Blitzen River at this site. We will also review streamflow forecasts for this site that are developed annually by the National Resource Conservation Service (NRCS) and examine the relationship between the Fish Creek snotel measurements and flows at this site. Finally, we look at long-term trends in the flow record and compare historical measurements upstream at the USGS gage and downstream at Sodhouse Dam.

Historical Flows

The Blitzen River near Frenchglen, Oregon receives drainage from an area of approximately 200 mi^2 along the midwestern portion of Steens Mountain in southeastern Oregon. The USGS records streamflow continuously in the river at a site located one mile south of the refuge boundary (USGS site no. 10396000, USFWS site no. 357010, Figure 2). The USGS began measurements at this location in the early 1900s and a continuous record of mean daily streamflow exists from 1938 to present. For our analyses, we consider mean daily streamflow for the period from January 1, 1938 to September 30, 2004.

The long period of record is very useful in characterizing summary statistics and variability in the Blitzen flows. There is additional spring inflow to the river in the Page Springs area, between the gage and the refuge boundary (Figure 3). The FWS measures flow downstream of Page Springs Dam at the refuge boundary but this does not capture the water diverted from the Blitzen above Page Springs Dam in the East and West canals. To account for all refuge inflow from the Blitzen, either the diversions must be measured along with the flow below Page Springs Dam, or the additional spring flow must be estimated and added to the flow measured at the USGS gage above the refuge.

Figure 4 shows annual runoff in the Blitzen River along with irrigation season totals for water years 1939 to 2004. Annual runoff in the Blitzen River over the 67-year period of record has averaged 91,000 acre-ft. It has ranged from a minimum of 36,000 acre-ft in 1992 to a maximum of 198,000 acre-ft in 1984. The hydrograph is dominated by a snowmelt signal in the spring and early summer. About 76% of the total annual runoff, or 69,000 acre-ft, occurs during the irrigation season, Mar-15 to Oct-1. 64,000 acre-ft, or 70% of the total annual runoff, occurs within a four and one half month period from Mar-15 through July-31. A Mann-Kendall trend test showed that there was no

significant increase or decrease in annual flows over the 67-year period of record (p=0.44).

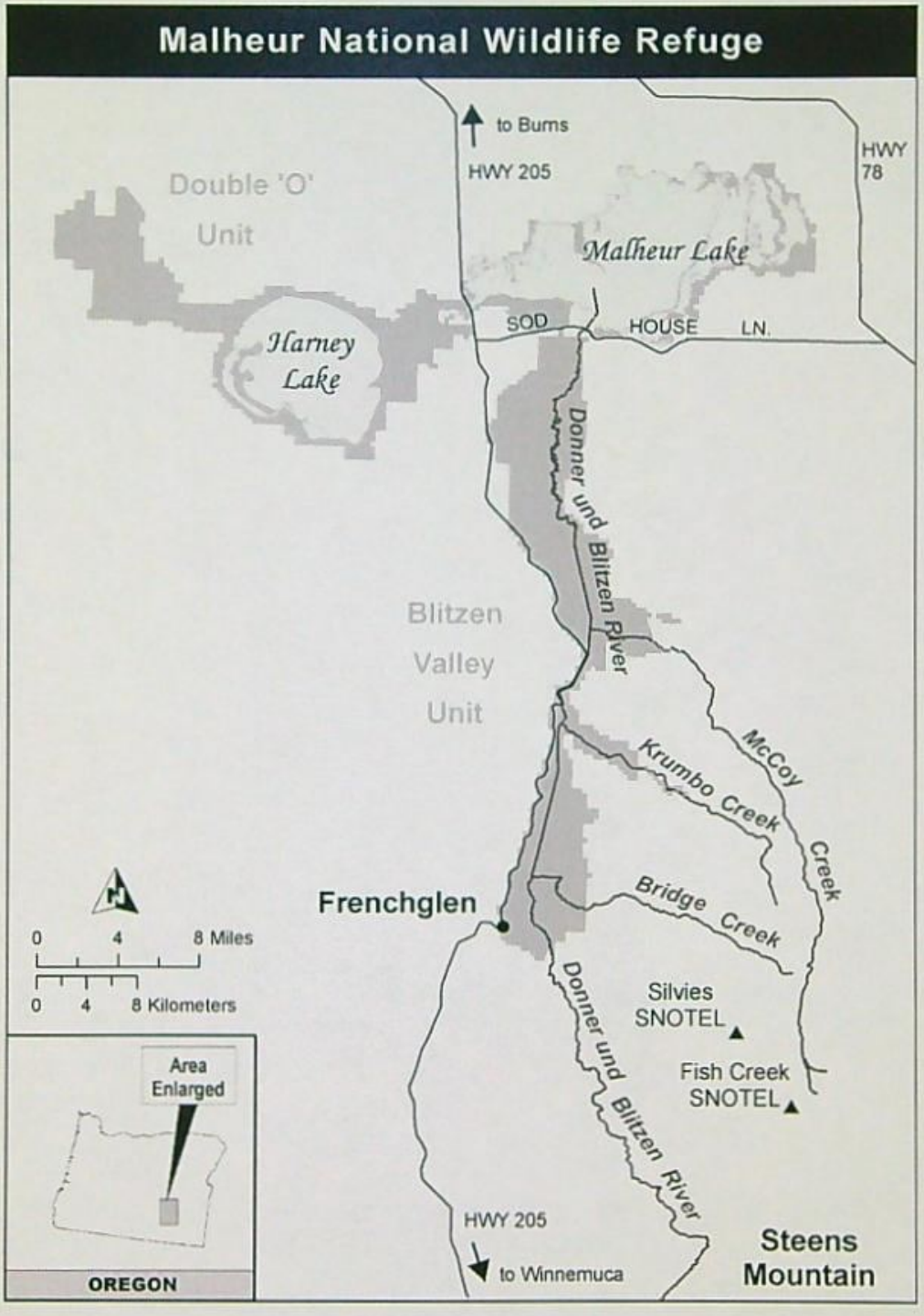

Figure 1. Map showing general location of Malheur NWR with the refuge boundary and units, the SNOTEL sites mentioned in this study, and several major landmarks and geographic features.

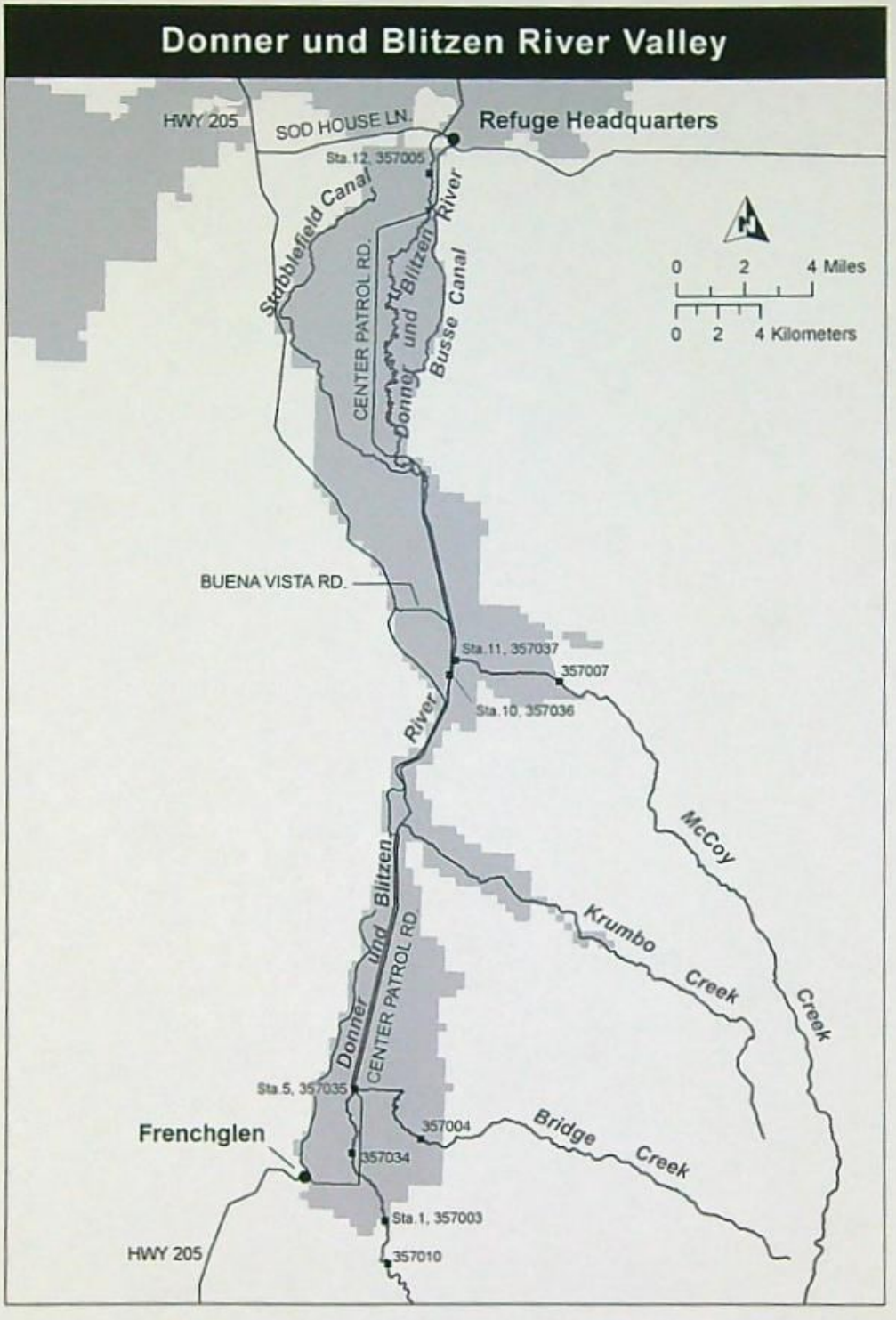

Figure 2. Map of Blitzen River Valley showing rivers and creeks, study monitoring sites, and several major landmarks and geographic features.

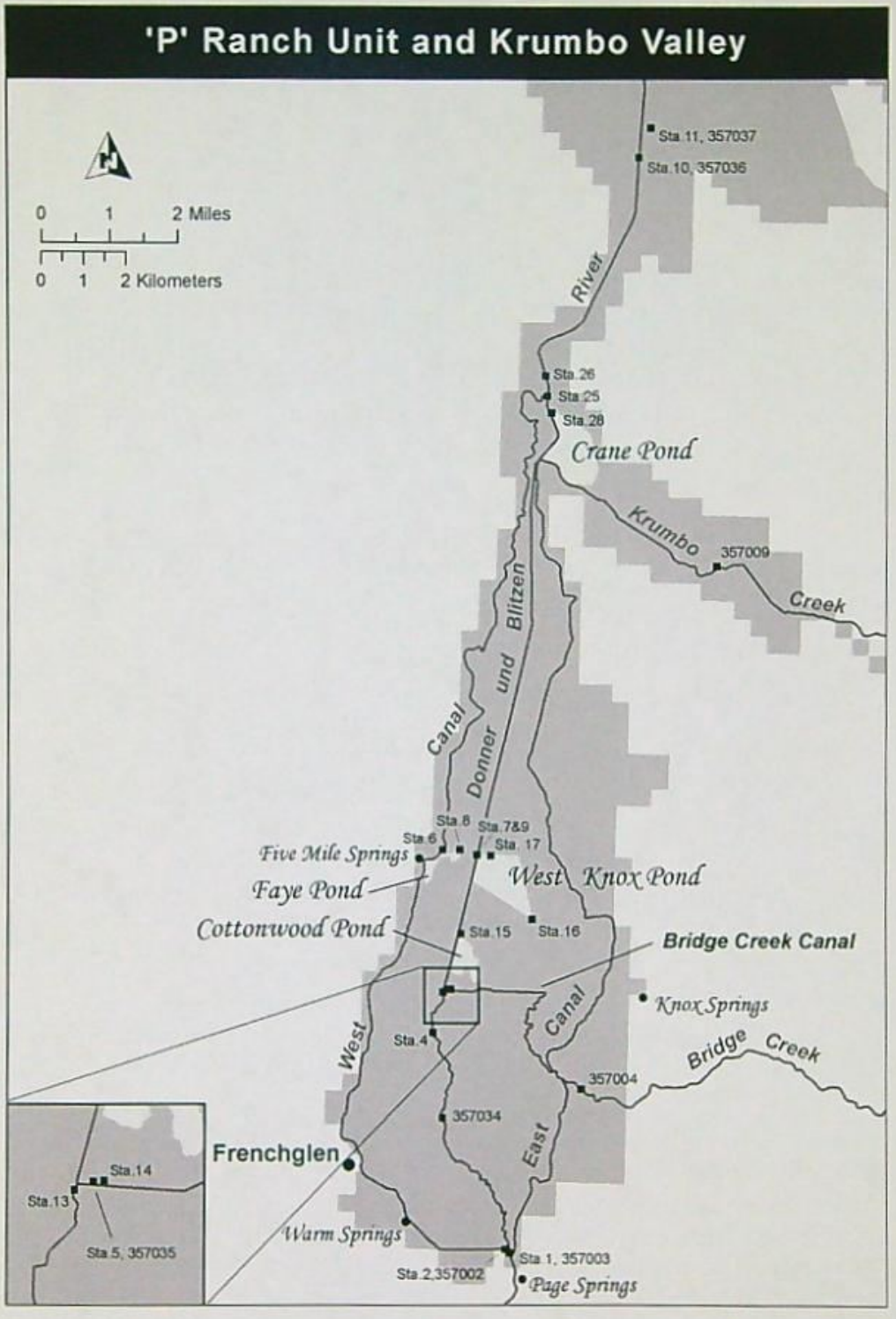

Figure 3. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

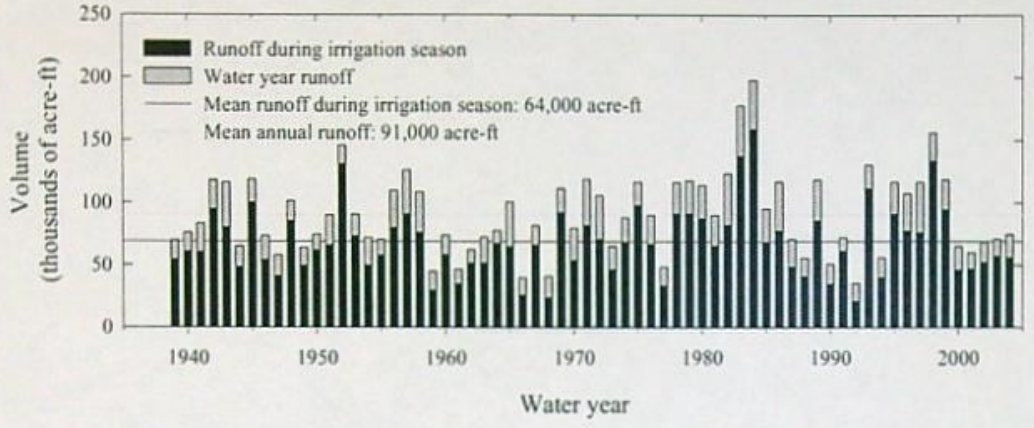

Figure 4. Water year totals and irrigation season totals and means in the Blitzen River, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1939 to 2004.

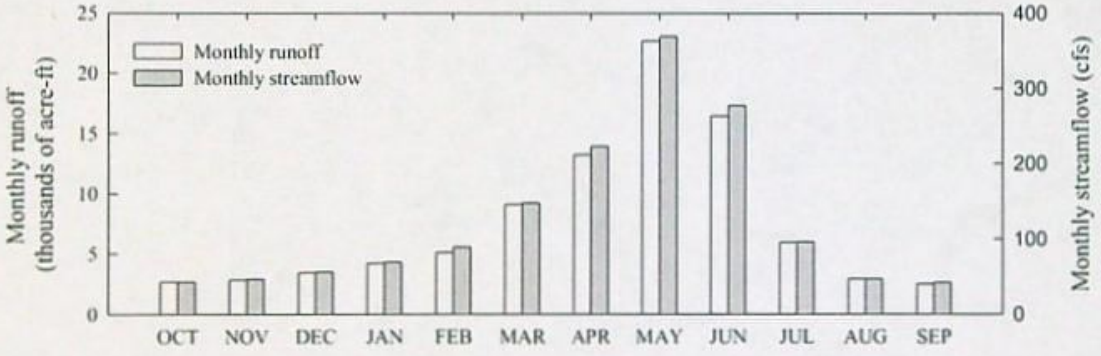

Figure 5. Mean monthly runoff for the Blitzen River, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1938 to 2004.

Streamflow in the Blitzen River is driven by snowmelt from Steens Mountain. Figure 5 plots the average monthly flows for the period of record and depicts the seasonal distribution of runoff that typically occurs in the Blitzen. Spring snowmelt at lower elevations in the drainage basin contributes to increased streamflows that usually begin in March. Flows generally reach a maximum in May. Flow in May averages 369 cfs (732 acre-ft/day) or 22,700 acre-ft for the month. This monthly volume represents 25% of total annual runoff, indicating that, on average, one-fourth of the total runoff for the year is received in this single month. The minimum monthly flow in May was 105 cfs in 1992 and the maximum was 826 cfs in 1998. Streamflows tend to decline in June and reach baseflow conditions sometime in July.

Minimum flows for the year are usually reached in September. Flows in September average 42 cfs (83 acre-ft/day) or 2,490 acre-ft for the month (2.7% of total annual runoff). September flows represent only about 1/40th of the total runoff for the year. The minimum monthly flow in September was 22 cfs in 1992 and the maximum was 87 cfs in 1984. There is a good relationship between total flow for the water year and Aug-Sept baseflow ($r^2 = 0.87$, Figure 6), with higher water year flows corresponding to higher baseflows in late summer. This implies that runoff forecasts for the Apr to Jul or Apr to Sept periods are useful both as an indication of total water available for irrigation and for predicting baseflows later in summer. As observed with annual flow, a Mann-Kendall trend test showed that there was no significant increase or decrease in baseflows over the 67-year period of record (p=0.35).

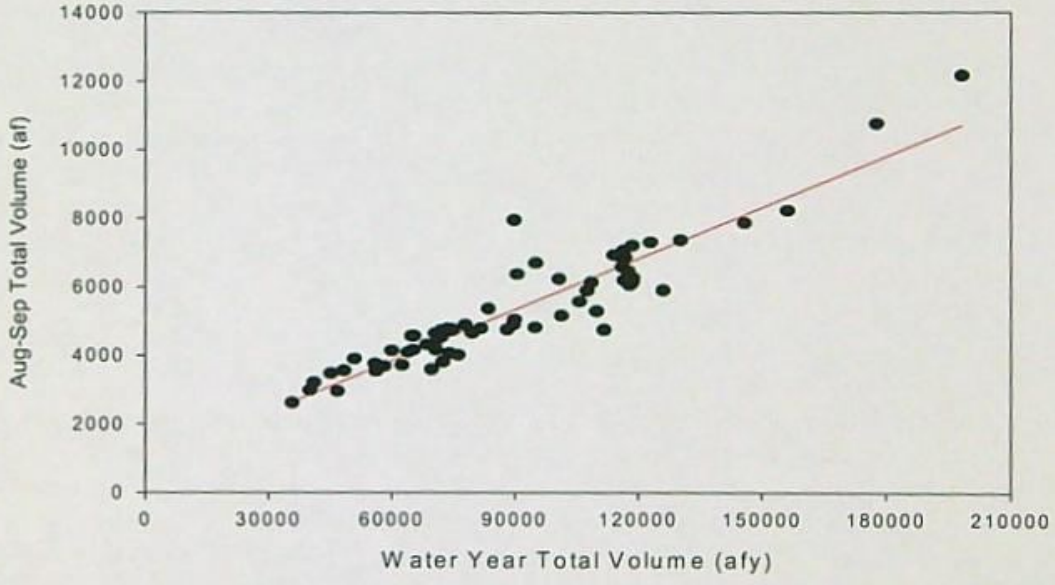

Figure 6. Relationship between total volume for the water year and the volume in Aug-Sep for USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1939 to 2004

While the greatest monthly runoff occurs in May in the Blitzen, mean daily flows for individual days during January and March have exceeded 2,000 cfs several times. These high flow events are attributed to rain-on-snow events. For example, an abnormally high flow event on January 2, 1997 resulted in a mean daily flow of 1,570 cfs (3,114 acre-ft), over 25 times the average flow calculated during two weeks leading up to the event. Snotel weather stations (Figure 1) at Fish Creek (elev. 7900 ft) and Silvies (elev. 6900 ft) recorded precipitation totals of 3.2 and 1.2 inches prior to the event, as well as significant increases in mean daily air temperatures. Streamflow in the Blitzen responds quickly (days) to such events and subsides to near previous levels within days-to-weeks, depending on the magnitude of precipitation, change in air temperature, and

volume of water contained in the snowpack. Of the winter months, March has historically had the highest variation in mean daily flows.

NRCS Streamflow Forecasts

Yearly forecasts of runoff in the Blitzen are available from the NRCS on their website at http://www.wcc.nrcs.usda.gov/cgibin/bor.pl. The NRCS forecasts runoff for two periods of the upcoming year: through July and through September. The starting date of the forecast period varies from March through May, depending on the time of the forecast. The flow forecasts through September are only slightly greater than the forecasts through July because so much of the flow in the Blitzen occurs in the spring.

NRCS begins making forecasts in January every year and updates monthly through June. The accuracy of the forecasts increases later in the season since there is less uncertainty remaining in the snowpack information. March and April forecasts are more accurate than January and February. March and April forecasts will probably be most useful for the refuge since they are fairly accurate and still provide early, timely information. Forecasts in May and June are most accurate but these may be too late for the refuge's planning. However, they could provide useful information for adjusting flows and management during the season. The year 1998 provides an example. Forecasted flows in March (140% of normal), April (121% of normal), and May (120% of normal) of that year turned out to be much less than the actual flow. The June forecast (207% of normal) – while still low – was much closer to the actual flow, which was 226% of normal. Such information could be useful for providing feedback and making early-summer adjustments to management on the refuge.

There is a fairly good relationship between the forecasted flows and the actual measured mean flow in September. Forecasts in later months more accurately predict September flows than earlier forecasts. The correlation between the Jun 1st forecast for May – Sept flows and the measured mean September flow for the last 15 years is very good ($r^2 = 0.85$, Figure 7). The regression equation can be used to predict September baseflows with reasonable certainty using the Jun 1st forecast. Note that because this is the mean September flow as measured at the USGS gage, upstream of the refuge, it does not include additional inflow from Page Springs. This inflow would have to be added to the flow at the USGS gage to estimate the flow reaching the refuge at Page Springs during September (see the later report in this section for such estimates).

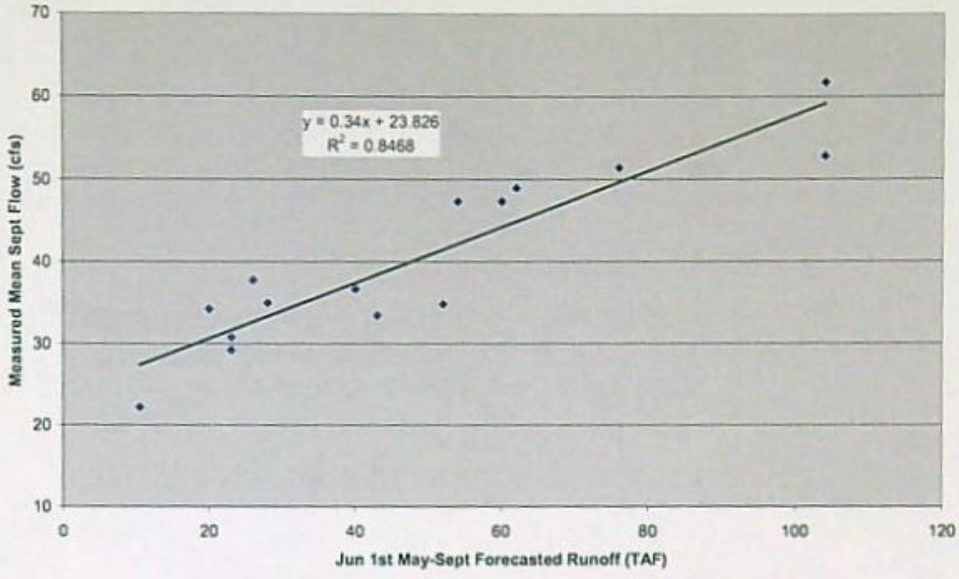

Figure 7. Relationship between NRCS Jun 1st forecasted runoff for the May – September period and measured mean flow in September for USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1990 to 2004.

Figure 8 shows the April 1st April – Sept forecasts and the actual measured April – Sept flows for the most recent 15 years. The graph presents the most probable runoff (the median or 50% exceedance forecast, symbolized with open circles). The other exceedance forecasts (90%, 70%, 30% and 10%) are based on the standard error of the regression equations and describe the range of uncertainty associated with the forecast. The smaller the exceedance percentage associated with a given forecast, the less chance that it will be exceeded. So the 70% exceedance forecast is going to have a higher probability of being exceeded, and will consequently be a lower predicted flow, than the 30% exceedance forecast. As discussed above, the standard errors decrease in later months as the forecasts improve in accuracy. Therefore the range of uncertainty described by the forecasts (and the range of the forecasted flows) decreases around the most probable number in later months. For this reason, the April 1st forecast will have a smaller range of values than the earlier forecasts that precede it.

The NRCS forecast is based, in part on information from the Fish Creek Snotel site on Steens Mountain. There is a good relationship between Apr-Sept flows and the snow water equivalent on April 1st for the entire period of record at this snotel site (r^2 = 0.60, Figure 9). The linear regression equation shown in the graph is a crude method of estimating the volume of runoff for the Apr - Sep period.

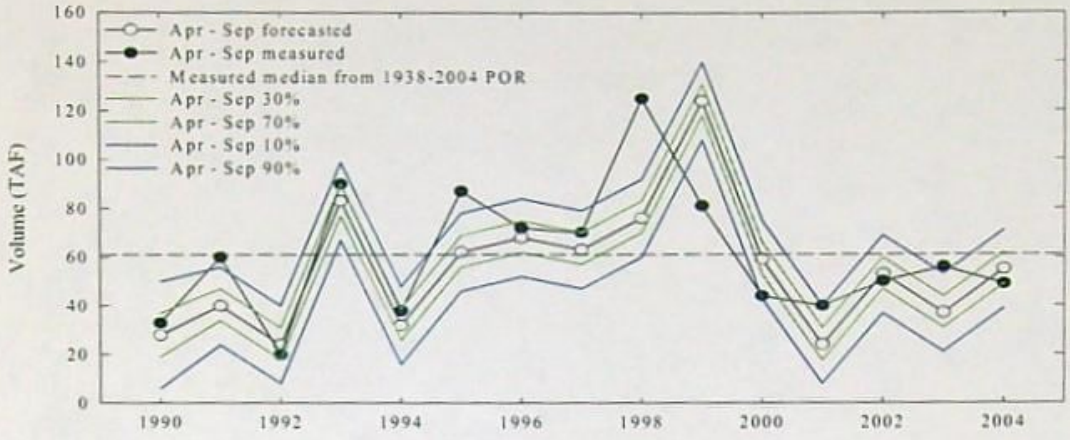

Figure 8. April 1st exceedance forecasts and measured flows for April -September, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1990 to 2004.

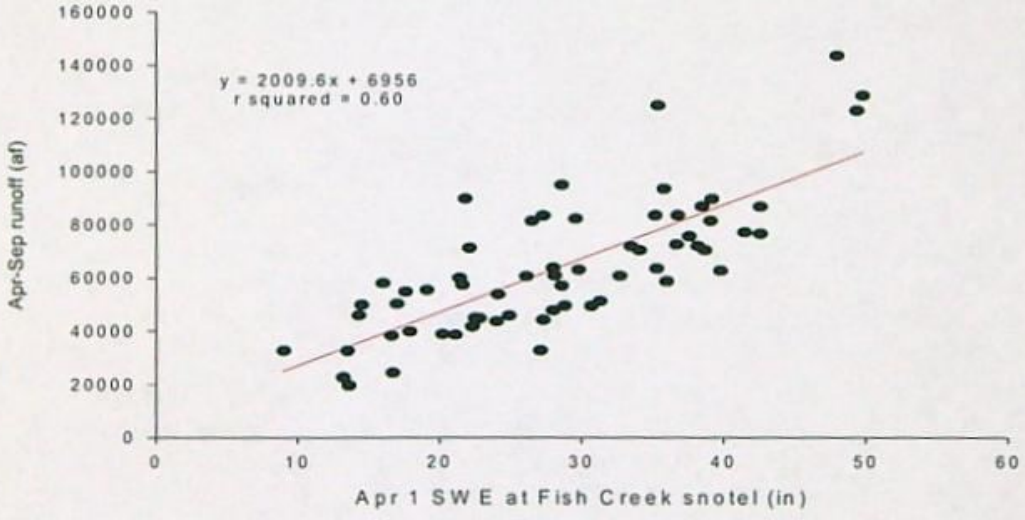

Figure 9. Relationship between April 1st snow water equivalent (SWE) at Fish Creek snotel and measured flows for April -September, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1939 to 2004.

Ranking of Streamflows

It is useful to have an idea of the relative amount of runoff that is forecast or measured in a given year. We have ranked all years of April to September runoff and classified them according to one of five hydrologic year types, based on the distribution. Figure 10 shows the rank and distribution of April to September runoff for the 67 years in the in the 1938 to 2004 period of record for the Blitzen. The median or 50th percentile of the April – September runoff is 60,650 acre-ft. All values of April – September runoff within the interquartile (between the 25th and 75th percentile of the data) are considered average years (shown in gray). Values less than the 25th percentile (<45,860 acre-ft) are considered dry years and values less than the 10th percentile (<32,788 acre-ft) are considered very dry years. Values greater than the 75th percentile (>78, 860 acre-ft) are considered wet years and values greater than the 90th percentile (>90, 580 acre-ft) are considered very wet years. Using these categories, the amount of runoff forecasted or measured for the April – September period can be assessed relative to all years in the period of record.

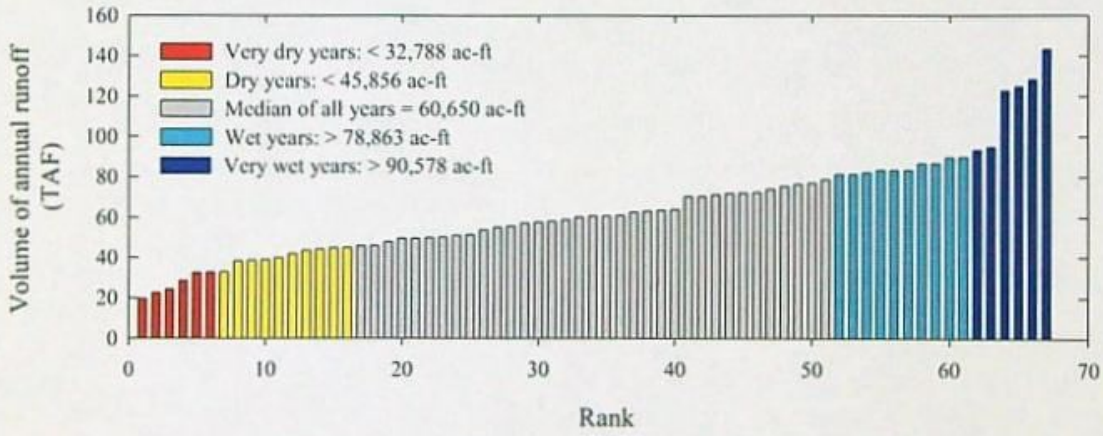

Figure 10. Rank (lowest to highest) and distribution of April-September runoff in the Blitzen River, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1938 to 2004.

Figure 11 is a histogram showing the distribution of April – September runoff for all years in the period of record. The data show a positive skewness (several observations much higher than the rest of the data) which is common for streamflow data. There is also a suggestion of a bi-modal distribution with one peak around 50,000 to 90,000 acre-ft and a second peak around 110,000 to 130,000 acre-ft. This is not unusual in that wet and dry years are often clustered in cycles and river flows often respond to the cumulative effects of several years of similar climatic conditions rather than individual years.

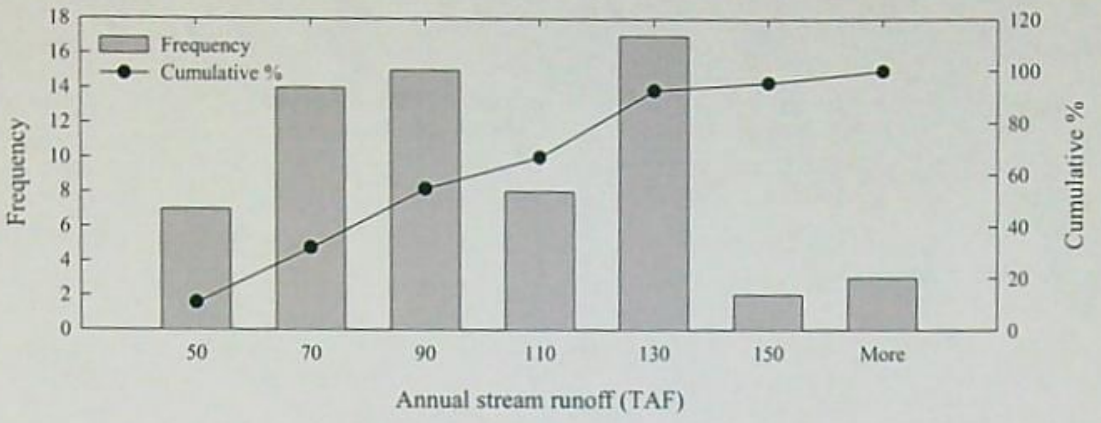

Figure 11. Frequency distribution of April - September runoff for all years in the Blitzen River, USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR, 1938 to 2004.

Comparison of Historical Blitzen Flows at Sodhouse Dam and the USGS Gage

There are historical flow measurements for several groups of years below Sodhouse Dam, the outflow from the refuge. It is interesting to compare these flows with flows measured at the upstream end of the refuge at the USGS Blitzen gage. Not all years at Sodhouse are complete, so we compared the Apr-Sept period for both gages, when available (Figure 12). There is a fairly consistent relationship between inflow at the USGS Blitzen gage and outflow at the Sodhouse gage. The Apr-Sept USGS Blitzen flows explain about 89% and 98% of the variability in the Sodhouse gage flows for the earlier and more recent periods, respectively. There has been slightly more Apr-Sept flow at Sodhouse for a given range of USGS Blitzen flows in recent years. Based on the x-intercept of the two regression lines, there will be very little Apr-Sept outflow at Sodhouse as the Apr-Sept USGS flows approach 35,000 to 40,000 acre-ft (dry years and very dry years). During the wettest years, the Apr-Sept flow at Sodhouse may equal or even exceed the Apr-Sept flow at the USGS Blitzen gage.

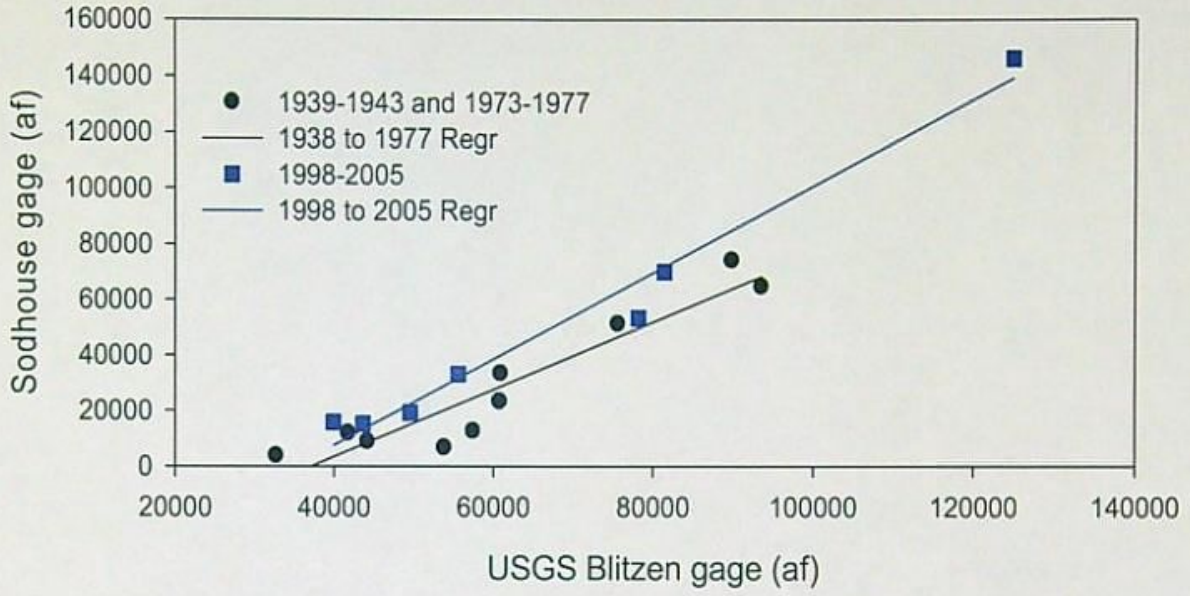

Figure 12. Apr-Sept total flows at the Sodhouse gage and the USGS Blitzen River gage for the years 1939-1943, 1973-1977, and 1998-2005.

Historical Flows and Summary Statistics for Bridge Creek above East Canal, Oregon

Tim Mayer, Rick Roy, Tyler Hallock, and Kenny Janssen
U.S. Fish & Wildlife Service

Bridge Creek originates along the northwestern slopes of Steens Mountain (Figure 1), draining an area only a fraction of the size of the Blitzen River watershed (approximately 30 mi^2). Flow in Bridge Creek moves westerly toward the refuge, where it enters along the eastern boundary roughly 3 miles northeast of Page Springs Dam (Figure 2). After entering the refuge, Bridge Creek joins East Canal for a short distance before separating again and flowing further west and into the Blitzen River. The purpose of this report is to provide information and analysis on the historical flows in Bridge Creek as it enters the refuge and compare those flows with flows in the Blitzen River.

Historical Flows

The USGS recorded streamflow in Bridge Creek above East Canal continuously from 1938 to 1970 (USGS site no. 10397000). The USFWS and the refuge resumed streamflow monitoring and measurements in June of 1994 at the same site (USFWS site no. 357004, Figure 2). Measurements were quite irregular during water years 1994 to 1999, but a continuous record extends from 2000 to 2003. We used the period of record that incorporates measurements from both the USGS and USFWS records, excluding the years 1994 to 1999.

There is little fluctuation in mean annual streamflow for Bridge Creek over the 37-year period of record. Annual runoff has averaged 9,680 acre-ft/yr for the period of record. It has ranged from a maximum of 13,900 acre-ft in 1942 to a minimum of 5,530 acre-ft in 1961. Maximum daily discharge occurred on March 15, 1939 when mean daily flow reached 120 cfs. On two other occasions mean daily flows reached 118 cfs, however, flows of this magnitude are relatively infrequent. Historically, mean daily discharge has been 25 cfs or less 95 percent of the time and 42 cfs or less 99 percent of the time.

Like the Blitzen River, streamflow in Bridge Creek is driven by snowmelt in the spring. However, peak flows are generally of shorter duration and relatively smaller proportion than peak flows in the Blitzen River. Peak flows usually don't continue past June. By July, flows in Bridge Creek are already near the minimum for the year, much earlier than Blitzen flows recede to baseflow conditions. Minimum flow, or baseflow, generally extends from July through February and averages 11.8 cfs or 716 acre-ft/month (Figure 3), with a minimum and maximum of 693 acre-ft/month (November) and 740 acre-feet/month (July), respectively. Large discharge events have occasionally exceeded 100 cfs during this period. Streamflows during the spring months of April, May and June average 19.1 cfs, 21.5 cfs and 14.6 cfs, respectively with monthly totals amounting to 1,140 acre-ft/month, 1,320 acre-ft/month and 870 acre-ft/month (Figure 3). Average seasonal flows and totals are summarized in Table 1. Total monthly runoff and mean daily streamflow at Bridge Creek are shown in Figure 3.

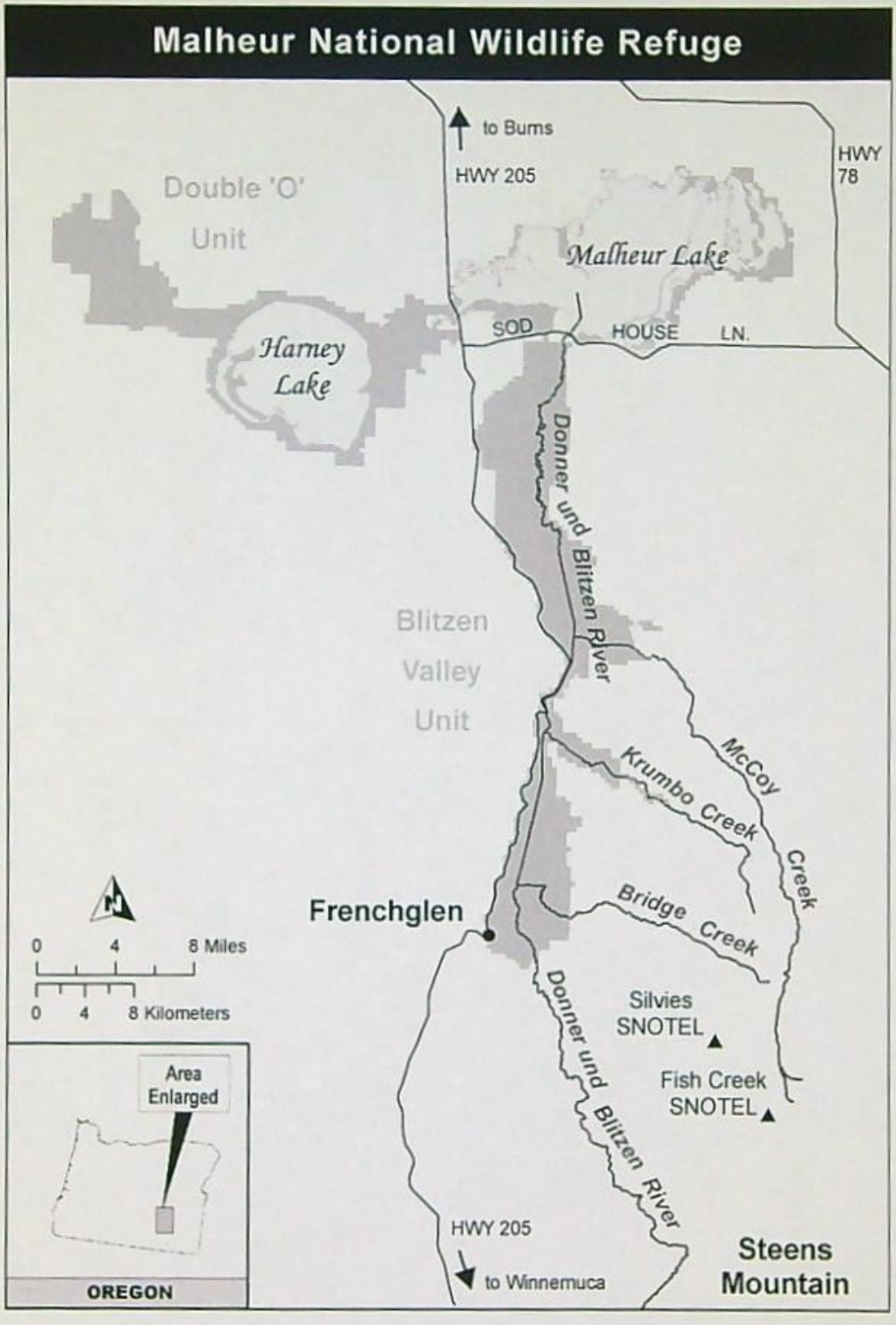

Figure 1. Map showing general location of Malheur NWR with the refuge boundary and units, the SNOTEL sites mentioned in this study, and several major landmarks and geographic features.

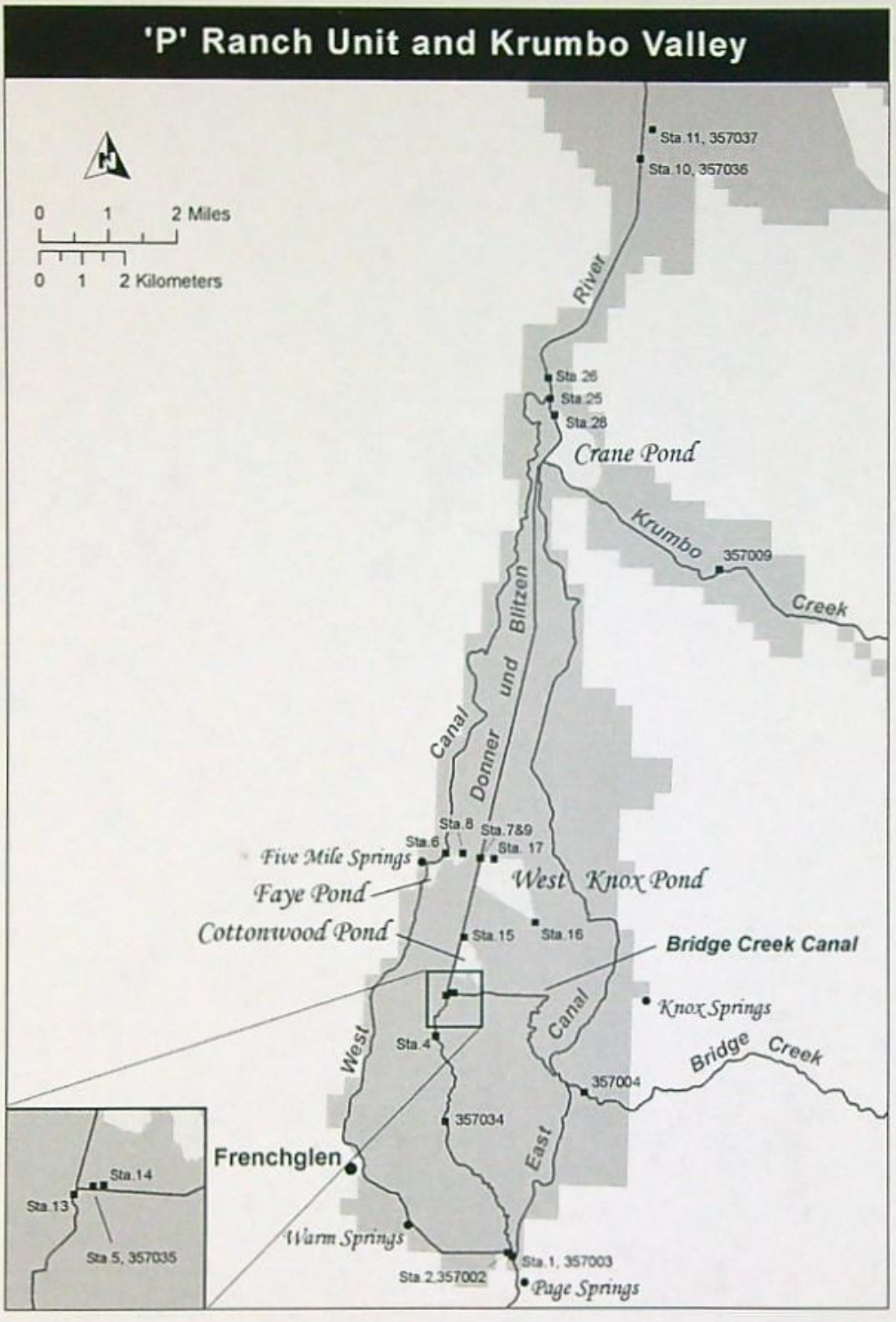

Figure 2. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

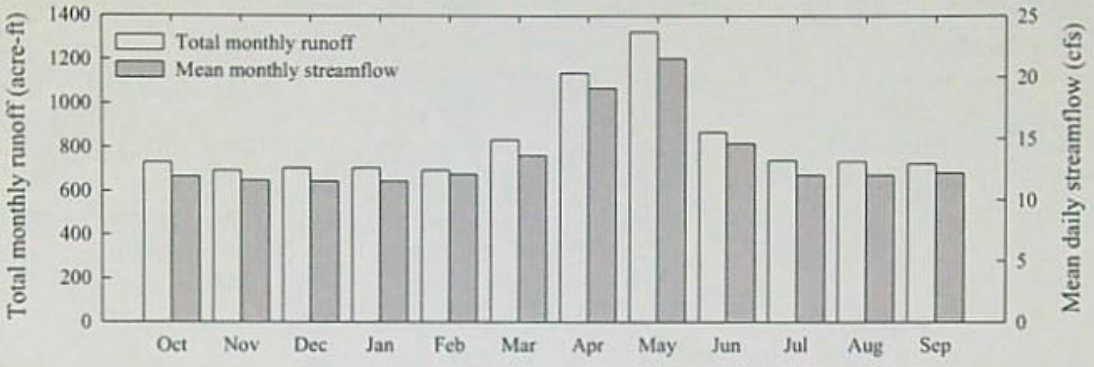

Figure 3: Mean monthly runoff and streamflow at Bridge Creek above East Canal, USGS site no 10397000 (1938 to 1970) and USFWS site no. 357004 (2000 to 2003).

Table 1: Seasonal streamflows and total runoff at Bridge Creek above East Canal

	Fall (Oct – Dec)	Winter (Jan – Mar)	Spring (Apr – Jun)	Summer (Jul – Sep)
Mean daily streamflow (cfs)	11.7	12.4	18.5	12.1
Total monthly runoff (acre-ft)	2,128	2,233	3,368	2,200
Percent of annual total (%)	21	22	34	22
Mean daily streamflow during dry years (cfs)	12.5	11.2	11.8	10.4

Bridge Creek Flows and Blitzen River Flows

Bridge Creek flows are considerably less than Blitzen River flows. Mean annual flow in Bridge Creek is 13.7 cfs and in the Blitzen River is 126.6 cfs. The timing and distribution of flows differ as well. Figure 4 illustrates the monthly percentage of total annual flow over the period of record for both Bridge Creek and the Blitzen River. Generally, Bridge Creek has a higher proportion of baseflow and a lower proportion of peak flows when compared with the Blitzen. Flow in Bridge Creek during peak conditions (Apr – Jun) is 34% of the annual total, compared to 60% in the Blitzen River (Table 1). Approximately 60%, or 5,950 acre-ft, of the total annual flow at Bridge Creek occurs during the irrigation season (Mar-15 to Oct-1). In comparison, irrigation season flows in the Blitzen account for 76% of the total annual flow. September monthly flows account for 7.4% of the total annual flow on Bridge Creek but only 2.7% of the total annual flow in the Blitzen.

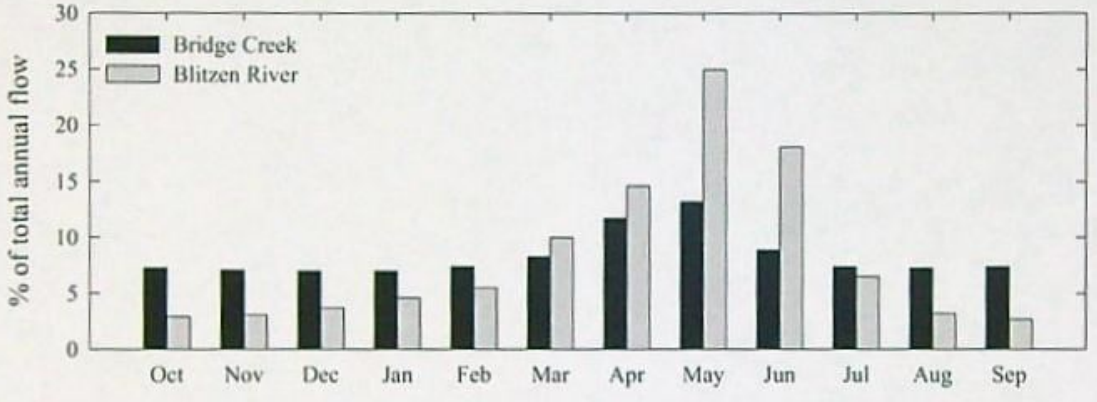

Figure 4: Percentage of total annual flow by month at Bridge Creek above East Canal and Blitzen River near Frenchglen, OR.

During drier than normal years, peak discharge events that are typically observed during spring months are greatly reduced and are only slightly above baseflows. For example, in WY 2002, the maximum daily flow during the runoff period was only 13.5 cfs. What is notable is that baseflows in Bridge Creek during dry years are near normal despite the absence of peak flows in these years (Table 1). Apparently, the spring discharge and subsurface seepage that supports the baseflow in Bridge Creek is not as sensitive to climatic trends as the peak flows.

Discharge in Bridge Creek responds very similarly to changing streamflow conditions measured in the Blitzen River near Frenchglen. Figure 5 is a correlogram illustrating how mean daily streamflows at these sites correspond with one another. The measure is given as a crosscorrelation coefficient, which defines the magnitude of how well the variables, in this case streamflows, are related. The strength of association is

described on a scale from -1 to 1, with zero indicating no relation at all, 1 indicating a perfect correlation, and -1 indicating a perfect inverse correlation. The correlogram also provides information on the lag, or offset, of the two variables. The lag describes when or where the two series are most related. Figure 5 illustrates the strength and timing of association between discharge at Bridge Creek and the Blitzen River over a two month span (30 days before and 30 days after). The greatest association is at time zero, where the crosscorrelation coefficient is 0.70. This indicates that in most cases, streamflows at Bridge Creek are changing at the same time as streamflows in the Blitzen River are changing. Figure 5 also shows relatively high coefficients for one day before (0.63) and one day after (0.63) zero lag indicating that streamflow response in Bridge Creek may either discharge slightly before (negative lag) or slightly after (positive lag) Blitzen River. The last noticeable pattern in Figure 5 is that the strength of association is greater for negative lag times than for positive lag times. This suggests that peak flows in the Blitzen River are most likely to occur later or over a longer period than peak flows in Bridge Creek.

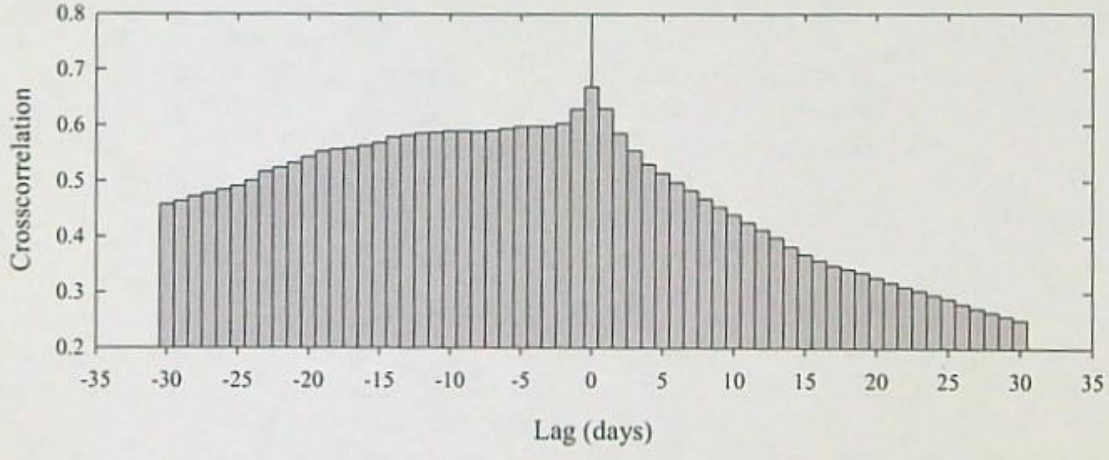

Figure 5: Cross-correlogram of mean daily streamflows at Bridge Creek above East canal and Blitzen River near Frenchglen, OR.

Estimated Spring Inflow to the Frenchglen Area of Malheur National Wildlife Refuge

Tim Mayer, Rick Roy, Tyler Hallock, and Kenny Janssen
U.S. Fish & Wildlife Service

There are four spring systems that contribute flow to the Frenchglen Area of Malheur NWR (Figure 1). One of these spring systems flows into the Blitzen River and the other three flow into East or West Canals. Flow estimates are needed from each of these spring systems to evaluate the total inflow to this area of the refuge. The purpose of this report is to discuss each spring system and provide flow estimates for each.

Page Springs

The main source of water for Malheur NWR is the Blitzen River. The Blitzen River enters the refuge at the southern boundary near Page Springs. Page Springs is the largest spring system in the Frenchglen Area and one of the largest spring systems on the refuge. The spring system contributes a significant but unmeasured volume of flow to the Blitzen River just upstream of the refuge (Figure 1). The total inflow from the Blitzen River to the refuge includes the contribution from Page Springs. Because the spring flow is diffuse and emanates from a number of sources, it can not be measured directly. However, spring flow will be fairly constant and less variable than the flow in the river. The purpose of the analysis is to estimate the discharge from the springs for use in evaluating the total inflow to the refuge from the Blitzen River.

The USGS operates a gaging station on the Blitzen River (USGS site no. 10396000, Donner und Blitzen River nr Frenchglen, OR) about one mile south and upstream of the southern boundary of the refuge. The period of record is from 1911 to 1921 and 1938 to the present. The discharge from Page Springs enters the river downstream of the gage and is not included in the measured flows from this site. Therefore, flow measurements at the gaging station do not provide a measure of the total inflow to the refuge since the station is upstream of Page Springs.

The FWS has a continuous gage below Page Springs Dam that has operated since September 1993. This gage is downstream of Page Springs but is also downstream of the refuge diversions to West Canal and East Canal. Both diversions are unmonitored. Flow measurements at this station do not provide a measure of the total inflow to the refuge unless the diversions to the canals are measured and accounted for.

A number of times in the past few years, the FWS has made instantaneous flow measurements at the East and West Canal diversions to estimate the spring discharge from Page Springs and the total inflow to the refuge from the Blitzen. The sum of the flows in the Blitzen River below Page Springs Dam, the diversion to East Canal, and the diversion to West Canal, minus the Blitzen River flow upstream of Page Springs at the USGS gage gives an estimate of spring flow at Page Springs. We contacted the Portland Office of the USGS for the flow measurements at specific times corresponding to the time of the other measurements.

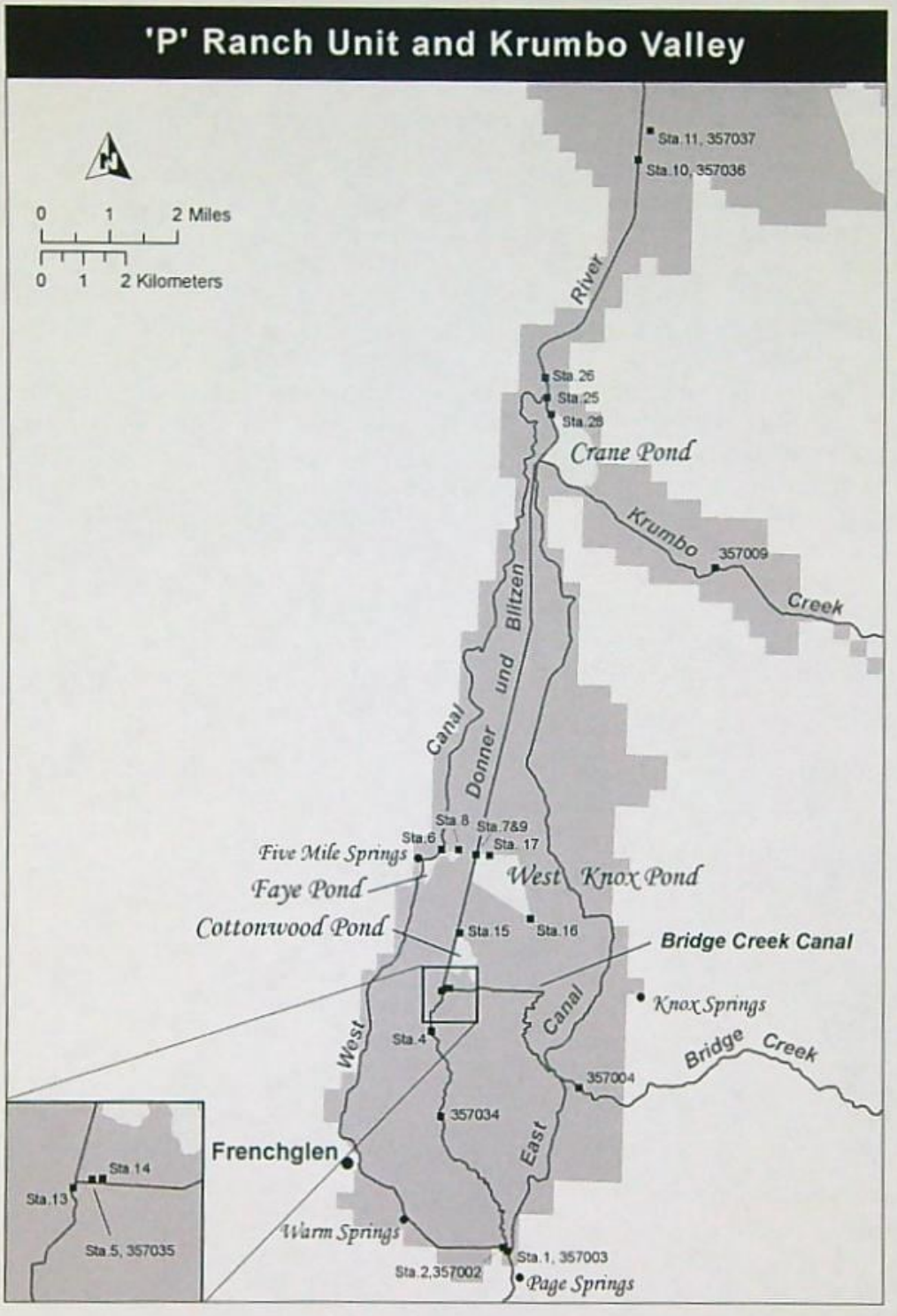

Figure 1. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

One problem with this approach is that the flows in the Blitzen River vary diurnally, especially during the runoff period in spring and early summer. It can require a couple of hours to measure the diversions in the East and West Canals and the river flows below Page Springs Dam and at the USGS gage can change during that time. The estimates of Page Springs flows during the runoff period may be problematic because of the diurnal variability in flows at this time of year. In addition, water is lost to flooding and bank storage during these periods and rating curves are typically less accurate at higher flows, creating other problems with the spring flow estimates during high water.

The resulting spring inflow estimates are shown in Figure 2 and Table 1. We have made measurements in 1997, 1998, 2002, 2003, and 2005. The measurements span wet years (1997 and 1998) and dry years (2002 and 2003) and the spring discharge estimates reflect this. 1997 and 1998 estimates are higher than 2002 and 2003. Although the winter of 2005 was very dry, the spring was very wet and the estimated spring flow was relatively high as well. The flow from Page Springs is estimated to range from 6 cfs in 2002 and 2003 to 12 to 16 cfs in 1997, 1998, and 2005. The average of all five years is 11 cfs. Adding 11 cfs to the USGS flows measured on the Blitzen River will provide a reasonable estimate of the total inflow from the Blitzen River to the refuge. Subtracting the flow below Page Springs Dam (FWS 357003) from the total refuge inflow as estimated above will provide an estimate of the combined volume of water diverted to the East Canal and West Canal.

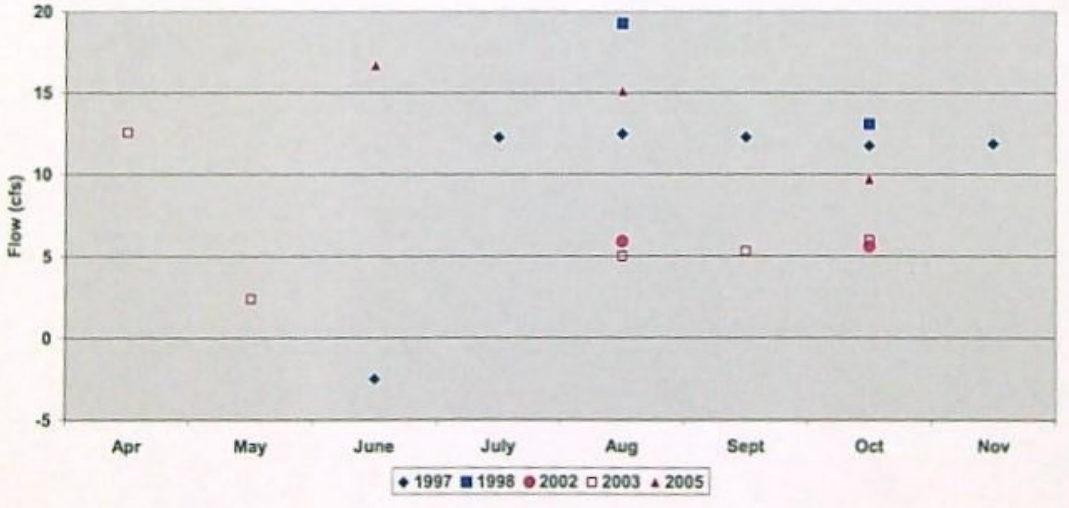

Figure 2. Estimated Spring Discharge at Page Springs near Frenchglen, OR, for the years 1997, 1998, 2002, 2003, and 2005.

Warm Springs

Warm Springs is located just south of the refuge between Page Springs and the town of Frenchglen (Figure 1). It is a smaller spring system than Page Springs and contributes flow into the West Canal. As with Page Springs, the flow emanates from several sources and can not be measured directly. Estimates of the contribution from Warm Springs were made by measuring the West Canal upstream of the springs at the Blitzen River and downstream of the springs at the Page Springs/Frenchglen Road. This approach measures the net contribution of the springs since there is some loss from evapotranspiration in the marshy areas along West Canal in the vicinity of the springs. Measurements were made when there were no diversions from West Canal along this reach. Paired measurements were made on the following four dates in 2003: Mar-12, Aug-4, Aug-27, and Oct-1.

The net contribution of flow from Warm Springs was 2.5 cfs in March, 0.2 to 0.3 cfs in August, and 0.6 cfs in October (Table 2). A seasonal pattern is apparent with a maximum contribution in the spring and a minimum in summer. This variation may reflect the greater evapotransipiration loss in the summer from the adjacent wetland and meadow as well as variability in spring flow. The specific conductance of the water in West Canal increased 1.4 to 1.5 times between the two measurement sites. The increase probably resulted from the evapotranpiration losses as well as the inflow of higher conductivity water from the springs. These are warm water springs and the water temperature in West Canal increased between the two measurement sites significantly (about 5°C based on two measurements in August). For purposes of estimating total inflow to the refuge, an average inflow of 2.5 cfs can be assumed in spring, 0.25 in summer, and 0.5 cfs in fall.

Five Mile Springs

These springs are located along West Canal just south of Five Mile Road (Figure 1). Estimates of the contribution of flow from these springs were very small (<0.5 cfs), based on three sets of paired measurements on West Canal upstream and downstream of the springs.

Knox Springs

These springs are located on East Canal just east of Knox Swamp and Knox Ponds (Figure 1). Flow from these springs is collected in a channel and can be diverted directly into East Canal or across East Canal into Knox Swamp. The channel is too small for flow measurements with a current meter but inflow was estimated visibly at about 1 cfs. The spring flow appears fairly constant throughout the season. These are cold water springs.

Table 1: Synoptic flow measurements for estimates of Page Springs inflow.

Water Year 1997	time	6/17/97	time	7/8/97	time	8/20/97	time	9/18/97			Average
East Canal	1405	49.5	1520	38.4	1500	20.2	1140	33.1			
West Canal	1300	45.0	1530	34.4	1700	21.4	1330	5.7			
Blitzen River	1135	183.0	1550	54.5	1105	19.9	1230	20.5			
Total Refuge Inflow at Page Springs		**277.5**		**127.3**		**61.5**		**59.3**			
USGS Blitzen abv Page Sprs	1300	280.0	1530	115.0	1300	49.0	1200	47.0			
Estimated Spring Inflow		***-2.5***		***12.3***		***12.5***		***12.3***			***12.1***
Water Year 1998	time	10/23/97	time	11/18/97			time	8/10/98	time	10/29/98	
East Canal	1417	3.3	1335	2.9			1435	12.3		5.0	
West Canal	930	2.6	1515	7.5			1300	6.8	915	2.0	
Blitzen River	1040	53.9	1420	45.5			?	76.2	1015	65.2	
Total Refuge Inflow at Page Springs		**59.8**		**55.9**				**95.3**		**72.1**	
USGS Blitzen abv Page Sprs	1200	48.0	1400	44.0			1400	76.0	1200	59.0	
Estimated Spring Inflow		***11.8***		***11.9***				***19.3***		***13.1***	***16.2***

Table 1: Synoptic flow measurements for estimates of Page Springs inflow (continued).

Water Year 2002	time	8/8/02	time	9/9/02							Average
East Canal	1325	9.9	1515	8.2							
West Canal	1400	5.4	1640	3.9							
Blitzen River	1315	27.6	1620	28.6							
Total Refuge Inflow at Page Springs		**42.9**		**40.6**							
USGS Blitzen abv Page Sprs	1400	37.0	1530	35.0							
Estimated Spring Inflow		***5.9***		***5.6***							***5.8***
Water Year 2003	time	4/3/03	time	5/1/03	time	8/3/03	time	8/27/03	time	10/1/03	
East Canal	1040	20.8	1150	15.9	1020	4.6	840	8.2	1520	8.55	
West Canal	900	37.2	1030	33.2	1100	6.4	930	4.7	1600	2.97	
Blitzen River	1000	60.6	1100	65.3	1100	38.0	900	26.5	1545	26.5	
Total Refuge Inflow at Page Springs		**118.6**		**114.4**		**49.0**		**39.3**		**38.0**	
USGS Blitzen abv Page Sprs	1000	106.0	1100	112.0	1300	44.0	1000	34.0	1600	32	
Estimated Spring Inflow		***12.6***		***2.4***		***5.0***		***5.3***		***6.02***	***6.3***
										Average:	***10.1***

All USGS flows are instantaneous values at the time of the other flow measurements, obtained from the Portland office (Jo Miller, 503 251-3201)

Table 1: Synoptic flow measurements for estimates of Page Springs inflow (continued).

Water Year 2005	time	6/21/05	time	8/2/05	time	10/4/05	Average
East Canal	1725	45.7	2000	10.7	1500	9.7	
West Canal	1830	25.1	1900	*1.0*	1500	*1.0*	
Blitzen River	1630	137.9	1930	51.4	1400	41.8	
Total Refuge Inflow at Page Springs		**208.7**		**63.1**		**52.4**	
USGS Blitzen abv Page Sprs	1630-1830	192.0	1930-2030	48.0	1400-1500	42.7	
Estimated Spring Inflow		***16.7***		***15.1***		***9.7***	***13.8***

Table 2: Synoptic flow measurements for estimates of Warm Springs inflow.

Date	West Canal Flow at Page Springs	West Canal Flow at Frenchglen/Page Springs Rd	Estimated Net Spring Inflow	Temperature (C) at Page Springs	Temperature (C) at Frenchglen/Page Springs Rd	Conductivity (uS/cm) at Page Springs	Conductivity (uS/cm) at Frenchglen/Page Springs Rd
3/13/03	1.33	3.83	2.50				
8/4/03	6.20	6.39	0.19	14.2	19.1	90	129
8/27/03	4.67	4.93	0.26	17.5	21.2	101	151
10/1/03	2.97	3.53	0.56				

Water Budgets, Net Inflow, and Consumptive Use Estimates for Malheur National Wildlife Refuge

Tim Mayer, Dar Crammond, Rick Roy, Kenny Janssen
U.S. Fish and Wildlife Service

The purpose of this report is to develop water budgets for six areas of the refuge with different scales and mixes of water use. The data for the water budgets comes from several sources: flow and survey data collected during this study; flow data collected routinely by the Water Resources Branch (WRB) for the maintenance of water rights and instream flows; and water rights information on irrigated acreage and areas of open water ponds/wetlands. The development of water budgets will allow us to estimate consumptive use and water requirements for different habitats and during different times of the year. We can also use water budgets to calculate nutrient loads and evaluate downstream water quality impacts. All of this information will be very useful in managing habitat and water at Malheur NWR.

BLITZEN VALLEY

The first water budget we developed is for the entire Blitzen Valley area of the refuge (Figure 1). This area includes all irrigated lands south of Sodhouse Lane and north of Page Springs, including the Krumbo Valley and the refuge lands in the Diamond Valley.

Methods

Total inflow and outflow for the Blitzen Valley area is based on the information submitted in the 2002 through 2005 annual Oregon Water Use Reports for Malheur NWR. We calculate total inflow to the Blitzen Valley as the sum of four gages: USGS Blitzen gage plus estimated Page Springs inflow upstream of Page Springs Dam; Bridge Creek above East Canal; total outflow from Krumbo reservoir; and McCoy Creek above Diamond Swamp. We estimate total outflow as the flow at the Blitzen below Sodhouse Dam. We are not accounting for inflow to this area from direct precipitation, other streams and springs (ex. Mud Creek, Web Creek, Boca Lake, Warm Springs, 5-Mile Springs), and subsurface inflow. There is unaccounted outflow to this area as well (several outflow channels under Sodhouse Lane to Malheur Lake, subsurface outflow).

We define net inflow as the difference between inflow and outflow for the two periods considered: April-Sept and the Oct-Sept water year. Net inflow provides an estimate of consumptive use, or water loss to evapotranspiration (ET) and seepage, from various habitats on the refuge. This assumes that changes in storage over the period are negligible. Net inflow and consumptive use do not equate to the entire water need on the refuge. There is water use on the refuge that is non-consumptive too, such as water that flows through a wetland or field and then returns to the river or water that is held for a time in a wetland or field and then released later in the season. Such non-consumptive uses are not included in the calculation of net inflow.

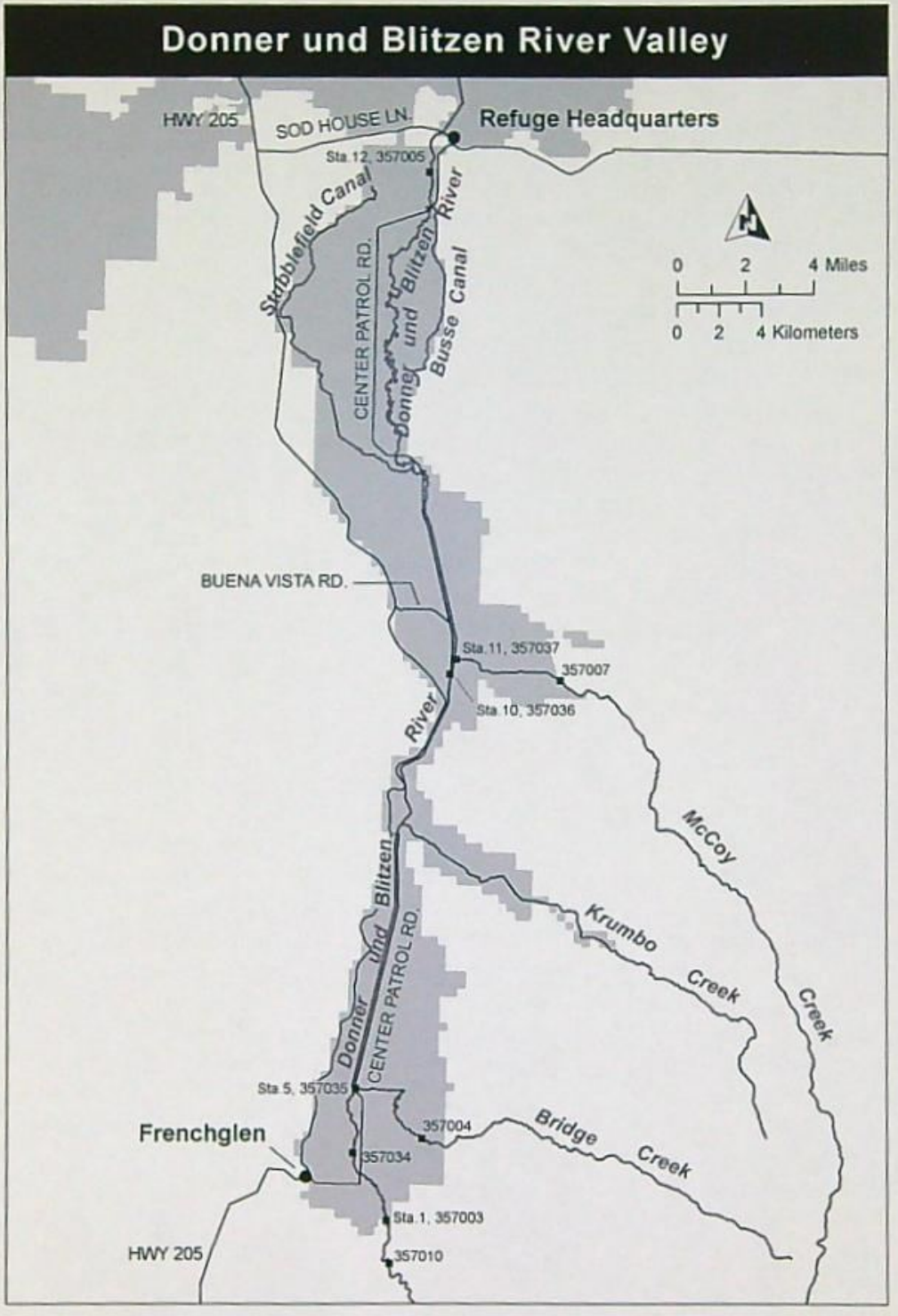

Figure 1. Map of Blitzen River Valley showing rivers and creeks, study monitoring sites, and several major landmarks and geographic features.

We express the net inflow for the Blitzen Valley as a consumptive use rate in the tables. It is calculated here as the difference between inflow and outflow divided by the total irrigated acreage for the area of consideration. Minister and Glaser Surveying, acting as Oregon Certified Water Rights Examiners (CWREs), mapped irrigated areas and areas of open water for the WRB in 1994. We checked the delineated acreage using 2005 aerial photography. We also compiled surface area information on open water ponds/wetlands, generated by our CWRE for the Ponds Bill water right certificates. The estimates of irrigated areas are approximate and may slightly overestimate the amount of irrigated land in any one year as not all lands are irrigated and not all ponds are full every year.

We present the percentile rank of the runoff for the period (Apr-Sept or water year) relative to all runoff totals for the same period in the 68-year record at the USGS Blitzen River gage. The percentile rank is a general indication of how wet or dry the year was, in terms of runoff. High percentile ranks mean wet years and low percentile ranks mean dry years. We also present Apr-Sept and Oct-Sept total precipitation at Burns, Oregon as a general indication of how wet or dry the year was in terms of direct precipitation input.

Results

The total irrigated area, including open water ponds, in the entire Blitzen Valley section of the refuge is about 36,000 acres. A maximum of 6,500 acres, or 18 % of this irrigated area is open water ponds and wetlands. However, most ponds are not filled to the maximum level every year or even throughout the season, and some may be dry all year, so this acreage number is likely high. The remaining 29,500 acres of irrigated area consist of wet meadows and fields. Some of these areas are hayed or grow grain for wildlife purposes.

The period from 2002 to 2005 includes one wetter year, 2005, and three dry years, 2002, 2003, and 2004 (Table 1). The estimated rates of consumptive use range from 1.3 to 1.7 acre-ft/acre for the Apr-Sept season and 1.3 to 1.9 acre-ft/acre for the water year. These are gross consumptive use estimates for all the lands in the Blitzen Valley. Individual areas within the refuge will use more or less than this general rate. In particular, individual open water or seasonal wetlands appear to use two to three times this average rate, as described further below. Most of the habitat in the Blitzen Valley consists of wet meadows and fields. Cuenca (1992) gives irrigation requirements for alfalfa, spring grains, and winter grains in Harney Valley as about 1.6 to 1.7 acre-ft/acre. Consumptive use estimates developed here are close to these numbers.

Most of the diversions in the Blitzen Valley occur in spring and summer, during the irrigation season. The volume of water diverted outside of the irrigation season is small. Diversions are highest in May, followed by April and June (Figure 2). The refuge diverts water into flooded fields and wetlands during the spring runoff period, when water is available, and then uses it consumptively, typically in place, throughout the summer. The refuge stops diverting water for the most part by the 3rd week of July and only a small volume of water is diverted in August and September.

The volume and timing of water used consumptively on the refuge is a function of water availability, water management, climate factors, and habitat management in a given year. The different habitats on the refuge require different amounts of water, as described further below. The average rates estimated here for the entire Blitzen Valley are collective averages of the individual rates for each habitat type, weighted by the size of that habitat throughout the area. Furthermore, climate factors such as precipitation, temperature, and wind can affect ET rates for all habitats. A hot, dry summer may result in more irrigation water being used consumptively in all habitats because of higher ET rates.

Habitat management also affects the consumptive use rates on the refuge. For example, in 2002, Boca Lake and Darnell Pond were left dry for construction projects and carp control. This resulted in about 1,000 acres of the total maximum 6,500 acres of open water ponds/wetlands being dry that year. In 2003, much of the area served by the East Canal was fallowed. Several of the ponds in that area were dry as well. These factors could be partially responsible for the lower consumptive use rates in 2002 and 2003.

Water availability in dry years like 2002 and 2003 may affect consumptive use on the refuge too. The refuge may limit overall irrigated acreage overall in any year due to reduced water availability and the need to maintain Blitzen River flows. Water availability also affects the timing of diversions seasonally. Water is diverted most heavily in the spring runoff period, because this is when it is available and efficiently diverted. Finally, the refuge curtails irrigation around the 3rd week of July to dry some fields and meadows for haying, which reduces the amount of consumptive use and ET from much of the irrigated area on the refuge.

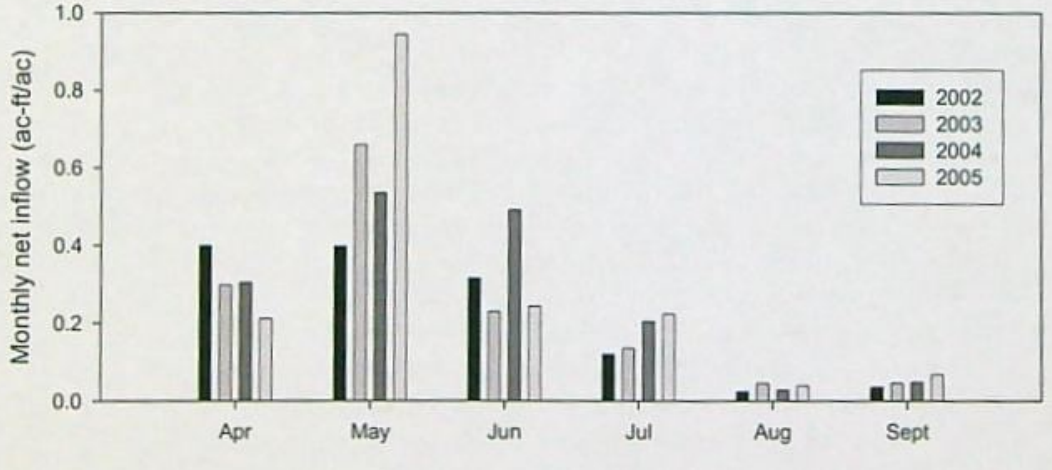

Figure 2. Monthly net inflow for Blitzen Valley, 2002 to 2005.

Table 1. Runoff, precipitation, inflow, outflow and consumptive use rates for the entire Blitzen Valley area of the refuge, 2002 to 2005
Units are acre-feet unless otherwise indicated.

Year	*2002*	*2003*	*2004*	*2005*
Apr-Sept runoff percentile	30%	40%	29%	75%
Apr-Sept pcp (in)	2.1	4.2	3.6	6.5
Apr-Sept inflow	66754	84167	75196	117709
Apr-Sept outflow	19837	32999	16758	55082
Apr-Sept net inflow	46917	51168	58437	62628
Apr-Sept CU rate (ac-ft/ac)	1.3	1.5	1.7	1.8
Oct-Sept runoff percentile	24%	30%	41%	58%
Oct-Sept pcp (in)	6.8	7.8	9.4	12.6
Oct-Sept inflow	96312	108921	113980	142994
Oct-Sept outflow	50499	55114	46412	78069
Oct-Sept net inflow	45863	53807	67569	64926
Oct-Sept CU rate (ac-ft/ac)	1.3	1.5	1.9	1.9

FRENCHGLEN AND BUENA VISTA AREA

The next water budget we developed is for the Frenchglen and Buena Vista area, a smaller subset of the lands described above (Figure 1). It includes all irrigated lands north of Page Springs and south of Stubblefield Canal, excluding the Diamond Valley refuge lands east of the Blitzen River.

Methods

Total inflow for this area is based on the information submitted in the 2002 through 2005 annual Oregon Water Use Reports for Malheur NWR. We calculate the total inflow to this area as the sum of three sites noted above: USGS Blitzen gage plus estimated Page Springs inflow upstream of Page Springs Dam; Bridge Creek above East Canal; and the total outflow from Krumbo reservoir. WRB measures the total outflow from the area as Blitzen River flow below Grain Camp Dam. This site is not reported to the state under the current Malheur measurement plan. The winter record is not complete for this site, so only the Apr-Sept period is considered here.

We present Apr-Sept percentile rank and Apr-Sept total precipitation at Burns, Oregon, as a general indication of how wet or dry the year was. As above, the acreage estimates are based on CWRE mapping of irrigated acreage and the Ponds Bill certificates. The difference between total inflow and outflow is the estimated net inflow for this area. Inflow and outflow for this area are not completely captured by these measurements. Additional inflow to the area occurs through direct precipitation, through the Stubblefield Canal, which irrigates a small portion of the lands (500 to 1000 ac) within the Buena Vista area, and through other unmeasured sources. Additional outflow occurs through a return flow pipe at the corner of Center Patrol Road and Buena Vista Road downstream of the gage below Grain Camp Dam, through East Grain Camp Canal, and other unmeasured losses. We express net inflow as a consumptive use rate, defined as discussed above.

Results

The total irrigated area in the Frenchglen and Buena Vista Area is about 22,000 acres. This includes as much as 5,300 acres (24%) of open water ponds and wetlands. The estimated open water pond/wetland area is likely high for the same reasons as discussed above. The estimated consumptive use for this area ranges from 0.9 to 1.4 acre-ft/acre for the Apr-Sept period (Table 2). Consumptive use estimates for this area appear to be fairly consistent and similar to those for the entire Blitzen Valley, with the exception of 2005. The lower rate in 2005 may have been due to the cool, wet spring that occurred that year. There was likely a considerable precipitation and runoff input to the area during that year that was not accounted for with the inflow measurements. As with the consumptive use estimates above for the entire Blitzen Valley, these are gross estimates that may not apply to all individual lands and habitats.

Table 2. Runoff, precipitation, inflow, outflow and consumptive use rates for the entire Frenchglen and Buena Vista area of the refuge, 2002 to 2005. Units are acre-feet unless otherwise indicated.

Year	*2002*	*2003*	*2004*	*2005*
Apr-Sept runoff percentile	30%	40%	29%	75%
Apr-Sept pcp (in)	2.1	4.2	3.6	6.5
Apr-Sept inflow	60334	70429	61816	85526
Apr-Sept outflow	32142	42846	33217	68154
Apr-Sept net inflow	28192	27583	28599	17372
Apr-Sept CU rate (ac-ft/ac)	1.4	1.4	1.4	0.9

WESTSIDE P RANCH AREA

This water budget is based on flow measurements we collected in 2002 as part of this study. The area is defined as all irrigated lands on the refuge south of 5-Mile Road, bounded to the south and west by West Canal and to the north and east by the Blitzen River (Figure 3).

Methods

We calculate the total inflow into the area as the sum of flows at West Canal at Page Springs; Highline Flume where it crosses the Blitzen River; and diversions at New Buckaroo and Old Buckaroo Dams. We calculate the total outflow from this area as the sum of flows at West Canal at 5-Mile Road; the diversion from Faye Pond into Jones Field at 5-Mile Road; and the return flow channel from Faye Pond that empties into the Blitzen River just upstream of 5-Mile Bridge. We monitored all of these sites from March through August of 2002, either continuously with Sigma flow meters or periodically with current meters. Sites that were monitored continuously were checked with independent measurements. For periodic flow measurements, we interpolated flows to get a daily record. We summed all daily inflows and outflows by month and only the monthly flows are presented here.

As above, the acreage estimates are based on the irrigated acreage and Ponds Bill certificates provided by our CWREs. There are three open water ponds in this area, Darnell Pond, Baker Pond, and Faye/5-Mile Pond. Faye/5-Mile Pond is south of and adjacent to 5-Mile Road. We monitored water levels in this pond by collecting readings of the staff gage.

Results

The total irrigated acreage in this area, including open water ponds/wetlands, is about 4,000 acres, based on the 1994 and 2005 aerial photography. There is as much as 220 acres, or 5%, of the total area in open water ponds and wetlands. This is a smaller proportion of open water area than for the entire Blitzen Valley. Moreover, the largest pond, Darnell Pond (109 acres), was dry in 2002. The consumptive use rate for the area was 1.5 acre-ft/acre, similar to the range for the entire Blitzen Valley. Most diversions occurred in April through June, during the spring runoff when flows are high and water is available to divert (Table 3 and Figure 4). Very little water was diverted after July and net inflow was actually slightly negative in August. A negative net inflow means that outflow was slightly greater than inflow for the period.

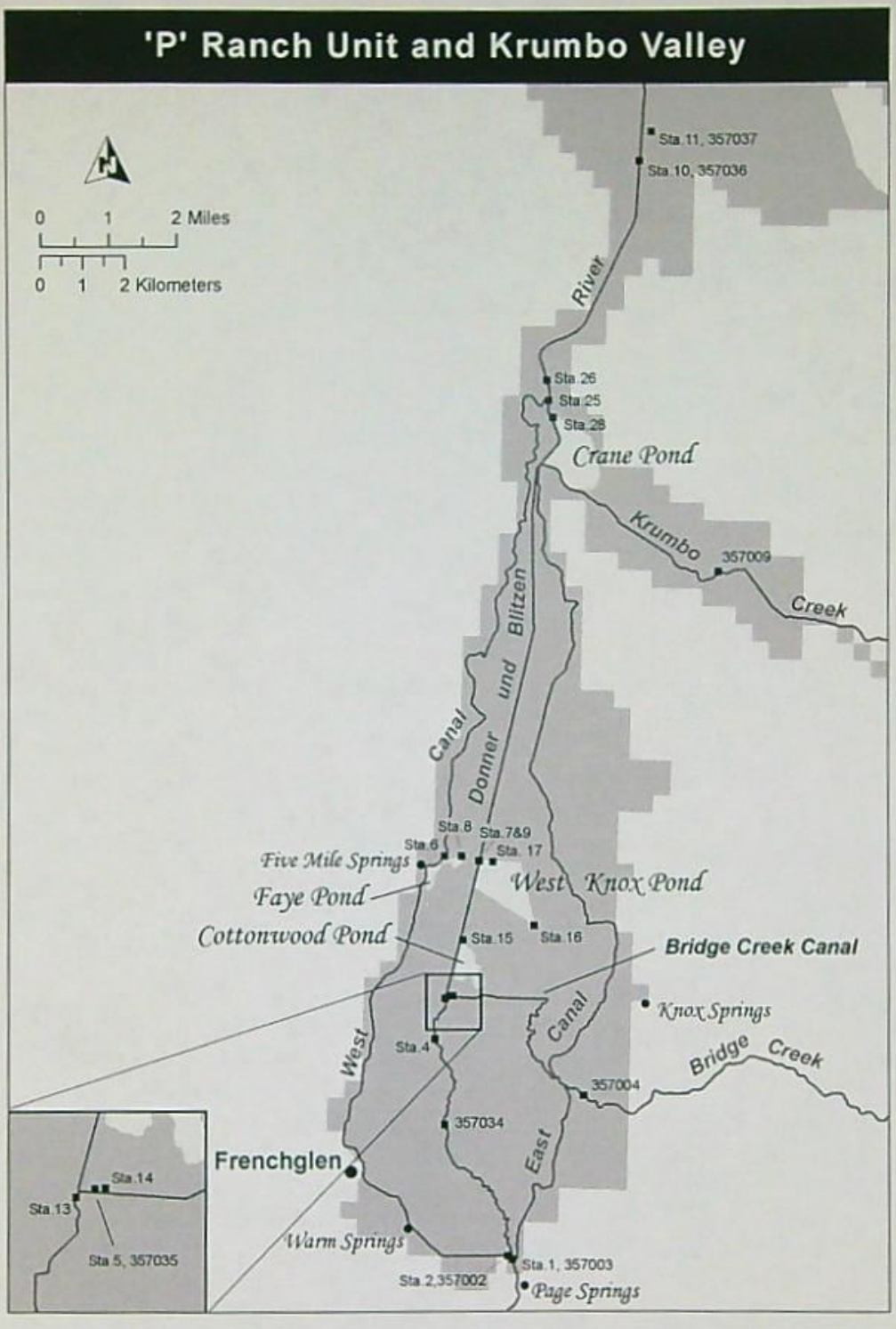

Figure 3. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

Table 3. Inflows and outflows for Westside P Ranch Area, 2002.
Units are acre-feet unless otherwise indicated.

	Mar	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Total*
W Canal at Page Sprs	462	2178	1698	1614	872	323	7147
Highline Flume	0	536	592	439	0	0	1568
New Buckaroo	208	1605	2050	1612	748	110	6334
Total Inflow	**670**	**4320**	**4340**	**3666**	**1620**	**433**	**15049**
Faye P return flow	0	71	682	351	135	135	1372
Jones Field diversion	33	842	1790	1494	802	19	4981
W Canal at 5-Mile Rd	286	585	512	354	432	564	2733
Total Outflow	**319**	**1497**	**2984**	**2199**	**1369**	**718**	**9087**
Net Inflow	**351**	**2822**	**1356**	**1466**	**251**	**-285**	**5962**
CU Rate (ac-ft/ac)	**0.09**	**0.71**	**0.34**	**0.37**	**0.06**	**-0.07**	**1.5**

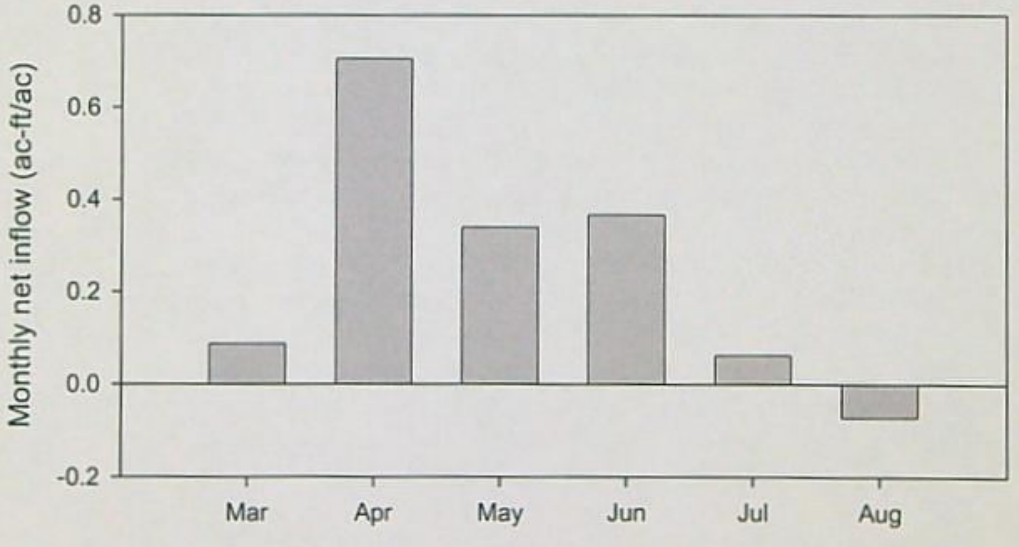

Figure 4. Monthly net inflow for Westside P Ranch, 2002 to 2005.

KRUMBO VALLEY

This water budget is for the area that includes all irrigated lands within the Krumbo Valley, downstream of the Krumbo reservoir and east of the Blitzen River (Figure 3). The refuge stores water in the reservoir and uses it as needed downstream to irrigate lands in the Krumbo Valley.

Methods

Total inflow for this area is based on the information submitted in the 2002 through 2005 annual Oregon Water Use Reports for Malheur NWR. WRB measures total inflow to the area using the flow at the Krumbo flume, located in the outlet channel downstream of the Krumbo reservoir. Total outflow from the area is not measured but is reasonably assumed to be zero. According to the refuge staff, flows are managed so that in most years, there is little or no outflow from the irrigated area. The exception is during years of really high spring runoff. The consequence of us underestimating outflow from the area would be an overestimate of consumptive use. We consider two periods: Mar-Sept and the Oct-Sept water year. We measured pond levels in Crane Pond in 2003 as part of this study, but they are not regularly monitored.

Results

The total irrigated area in Krumbo Valley is about 920 acres, based on the CWRE mapping and the 2005 aerial photography. There is a maximum of 400 acres, or 43%, open water ponds and wetlands (Crane Pond, at 335 acres, is the main pond in the area). This is a higher proportion of open water to irrigated land than in other areas. The consumptive use rate ranges from 1.3 to 1.7 acre-ft/acre for Mar-Sept and 1.6 to 2.8 acre-ft/acre for the water year (Table 4). The Mar-Sept rates are about equal to the average rates estimated for the entire Blitzen Valley, but the rates during the water year are higher. If outflow is underestimated, as discussed above, the rates may be overestimated.

Considering the greater proportion of open water/emergent wetland areas in Krumbo Valley, it is surprising that the Mar-Sept water use is not higher than rates for the entire Blitzen Valley. The reason for this may be that part of the water used to meet ET during the Mar-Sept season probably comes from water stored in the valley wetlands, both during and outside of the irrigation season. In 2003, pond levels in Crane Pond decreased by more than 2.25 feet from mid-April to early July. A decrease of this magnitude represents a considerable volume of water, given a surface area of 335 acres, and means much of the summer ET demand at Crane Pond was met through water stored in the pond. This suggests that the 1.6 acre-ft/acre of net inflow for the valley in 2003 was not adequate to sustain the pond levels and meet the total ET demand of the area.

The greater extent of open water/emergent vegetation wetlands in this area as compared to the entire Blitzen Valley is a function of the storage capacity upstream in Krumbo reservoir. Water is available longer in the summer to maintain wetlands and open water areas. Because of this ability to store water, the timing of monthly flows is later than in other areas (Figure 5). Peak monthly net inflow is in June and July, which coincides more with actual ET demand.

Table 4. Inflow and consumptive use rates for Krumbo Valley, 2002 to 2005
Units in acre-feet unless otherwise indicated.

Year	*2002*	*2003*	*2004*	*2005*
Mar-Sept inflow	1567	1484	1165	1220
Mar-Sept CU rate (ac-ft/ac)	1.7	1.6	1.3	1.3
Oct-Sept inflow	2571	2030	1498	1535
Oct-Sept CU rate (ac-ft/ac)	2.8	2.2	1.6	1.7

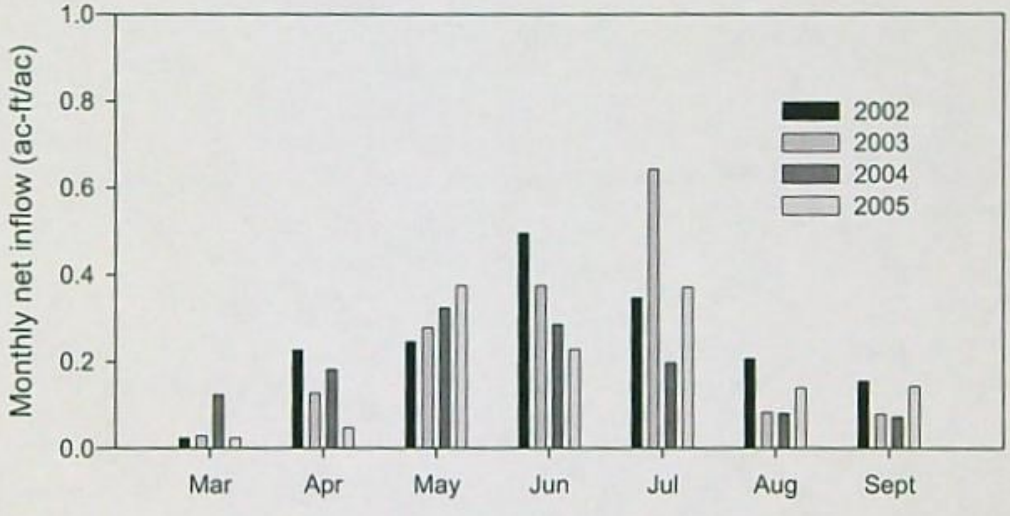

Figure 5. Monthly net inflow for Krumbo Valley, 2002 to 2005.

COTTONWOOD POND (SEASONAL WETLAND)

In contrast to the previous four water budgets, this water budget is for one individual wetland rather than an area combining wetlands, wet meadows and fields. Cottonwood Pond is located on the east side of the Frenchglen area, adjacent to the Blitzen River (Figure 3). It was managed as a spring seasonal wetland in 2002 and 2003. The refuge flooded the wetland in spring and allowed it to drain or evaporate by summer.

Methods

We measured pond levels, inflow, and outflow as part of this study in both 2002 and 2003. We measured inflow using a Marsh McBirney Flo-Tote that recorded depth and velocity continuously at 15-min intervals. We recorded pond levels periodically using a staff gage in the pond. For this study, we outfitted the top board in the flash board outflow structure with a thin metal plate to function as a sharp-crested weir. We collected measurements of head at the outlet structure with a Water Stik and applied a weir equation to estimate surface outflows. In 2002, there was surface outflow over the flash board structure from Apr 26 to May 20, 2002. Because the pond level was fairly constant in that interval, there was little variation in outflow. We interpolated between periodic measurements to estimate the total outflow. In 2003, the pond level was lower than in 2002 and the water level never reached the top of the flash boards at the outflow. There was zero surface outflow that year. We mapped the perimeter of the water surface contour with a GPS on May 1, 2002 at a staff gage level of 1.94. The perimeters of two small islands within the pond were also mapped. We calculated the surface area of the wetland using this GPS information.

Results

We determined that about 100 acres of the 160-acre unit is inundated at flood-up. This is equivalent to the estimated area of the pond, 102 acres, based on the Ponds Bill certificate.

When a seasonal wetland is flooded, water is used to inundate the wetland, saturate the underlying soil, and meet ET demand (Mayer, 2004). We consider all of this water in the consumptive use estimate here although, in actuality, not all of this water is necessarily used "consumptively." Additionally, the proportion of water used for these different components varies with the time of year that the wetland is filled. In this wetland, ground water depths at the time of flood-up were about the same in both years so it is likely that the volume of water needed to saturate the underlying soils did not vary between the two years. However, ET losses in this pond were likely much different because the timing of flood-up varied in the two years.

Figure 6 and Table 1 present the results of the monitoring. In 2002, the unit was flooded from the middle of April to the beginning of July. In 2003, the unit was flooded from the end of May through the end of August. The average rate of inflow to the wetland was 7.0 acre-ft/day in 2002 and 3.8 acre-ft/day in 2003. There was total net inflow of 204 acre-ft in 2002 and 342 acre-ft in 2003. The consumptive use rate was 2.0 acre-ft/acre in 2002 and 3.4 acre-ft/acre in 2003. More water was required to fill and maintain the unit in 2003 and the pond levels were actually lower than in 2002. This is probably because the unit was flooded later, during the summer rather than in the spring, and at a slower inflow rate than in 2002. The evaporative loss is much higher in summer than in spring and it appears that the slower inflow rate in 2003 could not keep up with the greater ET demand in the summer. This can be seen in the 2003 water levels, which were dropping throughout the summer even while there was inflow. In 2002, by contrast, the pond remained inundated for at least a month after inflow ceased in May.

The 2003 consumptive use rate for this pond is much higher than the average rates described above for the entire Blitzen Valley or the other smaller areas examined. Those average rates reflect the consumptive use requirements of all habitats on the refuge and, in general, there are few seasonal wetlands that are flooded in late spring and maintained through the summer. Most of the habitat in the Blitzen Valley is wet meadows and fields. The 2003 rate for Cottonwood Pond is similar to the rates reported for fall seasonal wetlands at Lower Klamath NWR (Mayer, 2004). In general, flooding seasonal wetlands in the late spring and summer will likely require more water than other habitats. Levels in seasonal or permanent wetlands in the summer will decrease rather quickly should the inflow be reduced or stopped at any time.

Table 5. Water Budget for Cottonwood Pond for 2002 and 2003. Units are acre-feet unless otherwise indicated.

Water Budget Component	**2002**	**2003**
Dates of flooding	4/15 to 7/1	5/27 to 8/25
Total inflow	225	342
Total outflow	31	0
Total net inflow	**194**	**342**
Estimated CU rate (ac-ft/ac)	**1.9**	**3.4**

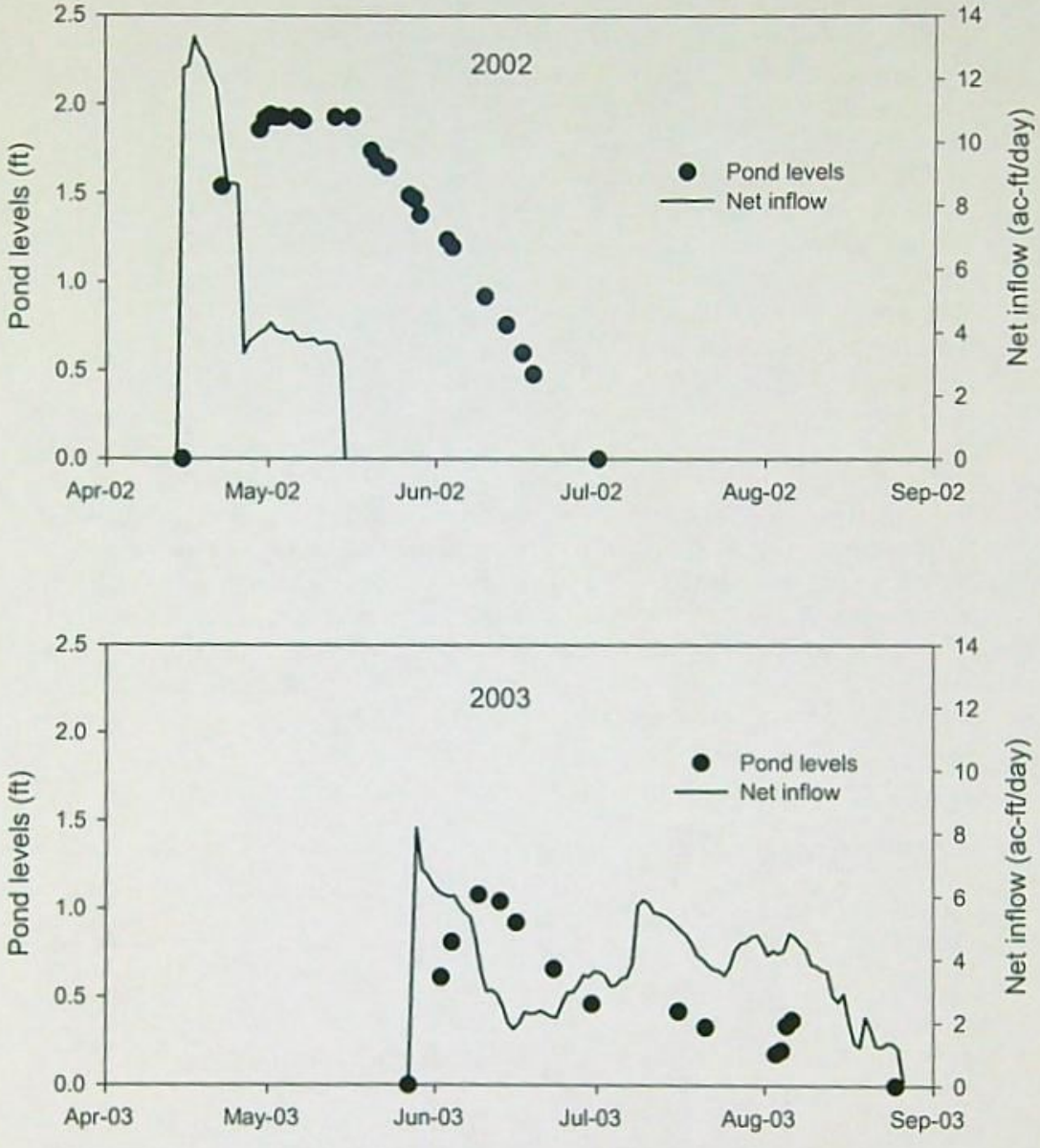

Figure 6. Pond levels and net inflow for Cottonwood Pond in 2002 and 2003.

WEST KNOX POND (PERMANENT WETLAND)

This water budget is also for an individual wetland, West Knox Pond, located on the east side of the Frenchglen area, adjacent to the Blitzen River and north of Cottonwood Pond (Figure 3). The refuge managed the area as a permanently flooded wetland in 2002 and 2003. The water budget for this area is more detailed than in the other areas because we tracked precipitation and changes in storage in the wetland in addition to measuring surface inflows and outflows. We used a water budget equation to estimate ET at the wetland. The water budget equation, formulated in simplified terms, describes the change in water stored in a water body over some period (ΔV) as the total inflow minus the total outflow (ΔV = total inflow – total outflow). For West Knox Pond, assuming no significant ground water inputs or losses, the total inflow includes surface water inflows and precipitation and the total outflow includes surface water outflows and ET. The water level in West Knox Pond indicates the change in storage. By measuring total inflows, total outflows, and changes in storage, one can solve the water balance to estimate ET losses from the pond.

Methods

We measured pond levels, inflows, and outflows for the period May 1 to September 30 in 2002 and 2003 as part of this study. We measured pond levels with a staff gage that was installed in the pond in May 2002. We recorded staff gage heights approximately every week in 2002 and then estimated daily pond levels by interpolating between observations. In 2003, we installed a Global Water pressure transducer and datalogger to record pond levels hourly. We averaged these hourly readings for daily means.

We developed a capacity curve for the pond to determine changes in storage in the pond. We mapped the perimeter of the pond's edge with a GPS at two water surface elevations spanning the range of pond levels. We determined the surface area of the pond at each mapped water level and developed a stage-area relationship, which allowed us to determine the wetted area of the pond for any given water level in the pond. We also developed a stage-volume relationship as well, by interpolating the underlying slope related to the area change (Mayer, 2004), which allowed us to determine changes in volume with elevation.

Total inflow to West Knox Pond includes diversions and precipitation; we assumed both ground water flow and overland flow were negligible. The source of surface water for West Knox Pond, Bridge Creek, is diverted through the K-2 Canal. In 2002, we monitored depth and velocity continuously at the inflow at hourly intervals from Jun-21 to Sept-6, using a Sigma flow meter. We collected independent flow measurements periodically as a check on the automated equipment. We calculated average daily inflow using the hourly data. Prior to Jun-21, daily inflows were estimated by interpolating between periodic flow measurements. In 2003, we made independent inflow measurements almost weekly from 21-Apr to 30-September. We estimated total surface inflow by interpolating between the twenty independent flow measurements.

We determined the precipitation input to West Knox Pond by multiplying daily precipitation totals recorded at P-Ranch (station ID: 6853) by the area of the pond. Missing days were estimated, based on observations at nearby weather stations using the normal-ratio method (Dingman, 2002). The nearby stations included OO-Ranch (station ID: 6302), Malheur refuge headquarters (station ID: 5162), Fields (station ID: 2876), and Burns Municipal Airport (station ID: 1175).

The refuge regulates the pond level and surface water outflow by manipulating boards in a flash board structure at the north end of the pond. For this study, we outfitted the top board in the structure with a thin metal plate to function as a sharp-crested weir. We applied a weir equation to estimate surface outflows using the continuous record of pond level that we developed. We collected periodic measurements of head at the weir with a Water Stik, as an independent check on outflow estimates.

The remaining terms not accounted for in the water balance equation are seepage and ET losses. Groundwater seepage out of the pond would be expected if the hydraulic gradient between the pond and the groundwater was downward toward groundwater. However, a standpipe piezometer installed in the west end of West Knox Pond, adjacent to the river, indicated a small hydraulic gradient (<0.07 ft/ft) into the pond. This was unexpected since the water surface elevation of the pond is higher than the water surface elevation of the adjacent river. However, several periodic flow measurements we collected concurrently in the river upstream and downstream of the pond (Station 13 and Station 9) indicated little or no seepage gain from the pond as well. Therefore, seepage loss from the pond was assumed to be negligible and all losses were assumed to be from ET. By designating total outflow as surface outflow from the pond plus ET, and accounting for changes in storage, the water-balance equation can be rearranged to solve for ET (ET = total inflow – surface water outflow – ΔV). To the extent that there is groundwater seepage into or out of the pond, we would underestimate or overestimate ET.

ET estimates at West Knox Pond based on measurements were compared with theoretical calculations of potential ET rates. The purpose was to identify a theoretical ET method that could be used to examine the variability of ET over a longer period and to compare the 2002 and 2003 estimates with the range of estimates. A number of methods are available for estimating ET (Rosenberry et al., 2004) differing in terms of their input data requirements and time periods over which they are calculated (e.g. daily, weekly, monthly, etc.). Some methods require only air temperature, while others require measurement of numerous hydrological and/or meteorological conditions. The choice of any particular method is often limited by the availability of input data at a specific site. Rosenberry et al. (2004) reported that even some of the less rigorous methods give reasonable estimates of ET

Of the thirteen techniques compared by Rosenberry et al. (2004), the only methods applicable for estimates at West Knox Pond are those that use air temperature or both air temperature and incoming solar radiation as inputs, because these are the only data available West Knox Pond. A preliminary investigation of those methods at West Knox Pond revealed that the Jensen-Haise method compared best with the water-balance ET estimates in 2002 and 2003. Rosenberry et al. (2004) reported that this method is among the more favorable techniques when compared to energy-budget measurements of ET.

The Jensen-Haise method requires air temperature and incoming solar radiation as input data. We used mean daily air temperatures recorded at P-Ranch (station ID: 6853). We found air temperatures at Burns Municipal Airport (station ID: 1175) to be very similar to those measured at P-Ranch between the months of May and October and we used these to replace missing values at P-Ranch (70% missing in 2002 and 20% in 2003). Total daily incoming solar radiation is recorded at the Eastern Oregon Agricultural Research Center in Burns, Oregon. We computed a daily average by dividing the total incoming solar radiation for the day by the number of sunlight hours. We calculated total hours of sunlight for each day using methods outlined in Dingman (2002) with information specific to the latitude of West Knox Pond. We estimated the total May through September ET at West Knox Pond for a 25-year period of record (1979 to 2003) using the Jensen-Haise equation.

Results

Figure 7 is a map of the surface area of the pond at two water levels: 1.84 ft and 2.41 ft on the staff gage. These two water levels span the range of normal operating water levels at the pond. Surface areas are 207 acres and 226 acres at the two water levels, respectively. There is little increase in surface area at the higher water level; relatively steep levees on three sides retain water. The total area of the wetland unit is about 300 acres.

Figure 8 shows the pond levels and net inflow over time for both years. Pond levels were highest in the spring and lower in the summer and fall. The range of pond levels was about 0.7 feet in both years. Pond levels were about 0.2 feet lower in 2002 compared with 2003. The pond level is regulated through flash boards at the outlet and the difference between years resulted from setting the crest of the boards at a lower elevation in 2002. The lower board height in 2002 also resulted in continuous surface outflow for the entire period. In contrast, there was only a limited period with surface outflow over the flash boards in 2003.

We estimated the decrease in storage over the season at 119 acre-ft in 2002 and 123 acre-ft in 2003 (Table 6). Pond surface area was slightly smaller in 2002 as well, due to the lower levels. The range of surface area was 206 to 230 acres in 2002 and 212 to 235 acres in 2003. The surface area is not very sensitive to changes in water level at the range of pond levels observed during these two years.

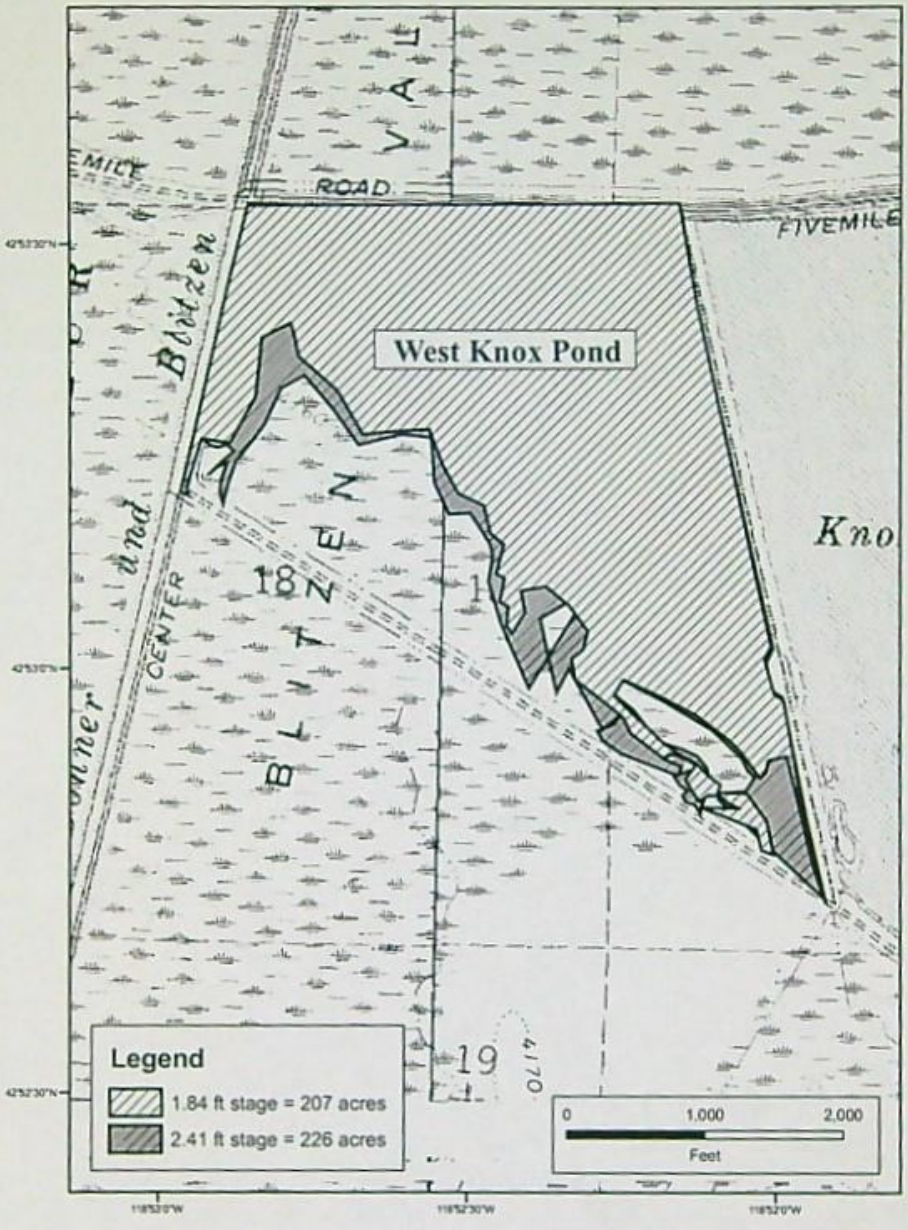

Figure 7. Surface area of West Knox Pond at staff gage levels of 1.84 ft (207 acres) and 2.41 ft (226 acres).

Daily surface inflows averaged 9.9 acre-ft/day in 2002 and 5.4 acre-ft/day in 2003. The volume of total inflow (surface inflow and precipitation) for the May through September period was 1556 acre-ft in 2002 and 888 acre-ft in 2003 (Table 6). The smaller rate and volume of inflow in 2003 probably resulted from adjustments in the diversion structure at Bridge Creek. Total precipitation in 2002 was 43 acre-ft (Table 1) or < 3% of the total inflow for the period. In 2003, precipitation totaled 62 acre-ft, or 7% of the total inflow for the period.

As discussed above, we assume that outflow from the pond is primarily through surface water flows and ET. Water levels remained above the height of the weir crest at the outflow structure for the entire period in 2002, in part because the flash boards were set at a lower elevation in 2002. In 2003, the water level of the pond receded below the height of the weir crest for several months, resulting in zero outflow from July through the September, primarily because the flash boards were set higher. Total volume of surface outflow was 614 acre-ft in 2002 and 128 acre-ft in 2003 (Table 6). Net inflow (total inflow minus outflow) was 942 acre-ft in 2002 and 760 acre-ft in 2003. We summed net inflow plus changes in storage to provide estimated consumptive use or ET in West Knox Pond for both years.

Figure 9 presents monthly ET at West Knox Pond (ET_{wb}) for the May through September period in 2002 and 2003. For both periods, ET shows the expected seasonal trend; lower in the spring and fall with a maximum in July. The estimated total ET requirement for the season was 1061 acre-ft, or 5.0 acre-ft/acre, in 2002 and 883 acre-ft, or 4.0 acre-ft/acre, in 2003 (Table 6). However, we believe that improved information on pond levels, pond volume, and surface outflows in 2003 allowed for a more accurate estimate of ET in our results and we have more confidence in the 2003 ET value of 4.0 acre-ft/acre. The estimated ET losses are considerably greater than surface outflows, especially in 2003. This implies that most of the water requirement for the pond is used to meet ET demand.

Table 6: Water Budget for West Knox Pond for 2002 and 2003. Units are acre-feet unless otherwise indicated.

Water Budget Component	May-Sept 2002	May-Sept 2003
Total surface inflow	1513	826
Precipitation input	43	62
Total Inflow	**1556**	**888**
Total Surface Outflow	**614**	**128**
Change in Storage	**119**	**123**
Residual	1061	883
Estimated ET Rate (ac-ft/ac)	**5.0**	**4.0**

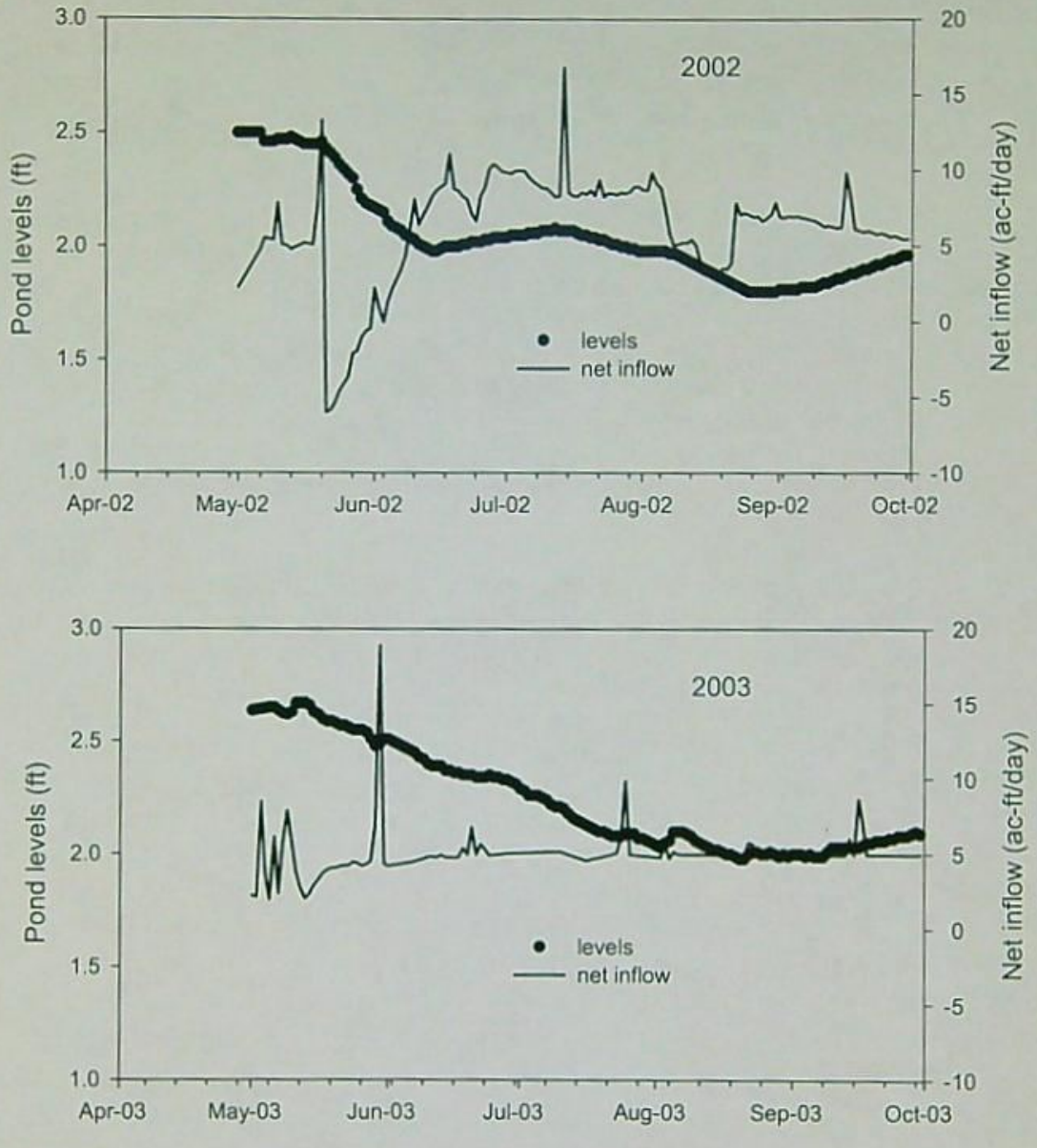

Figure 8: West Knox Pond levels and net inflow in 2002 (top) and 2003 (bottom).

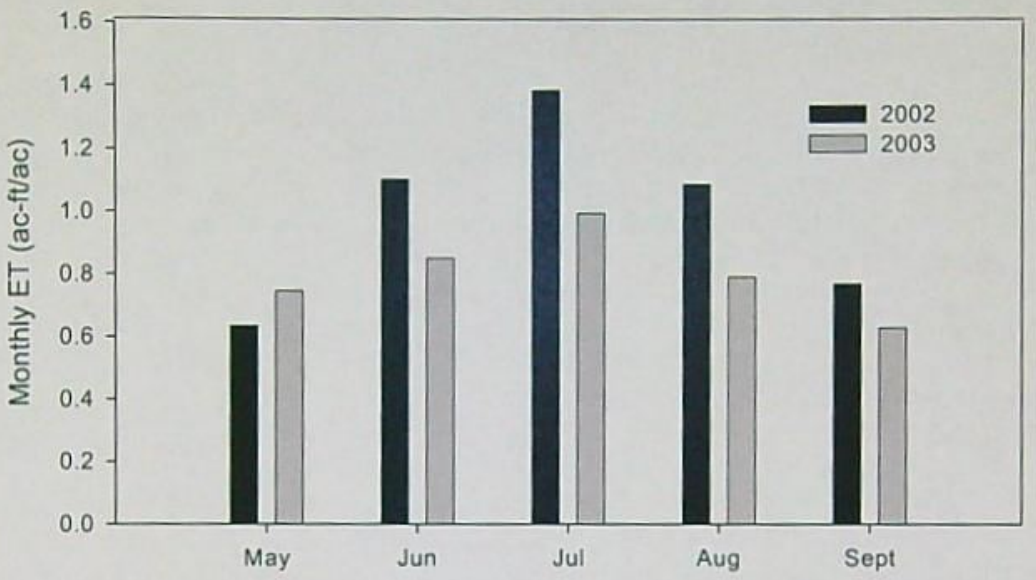

Figure 9: West Knox Pond monthly ET requirement in 2002 and 2003.

Measurements of ET from open water and bulrush marsh at Ruby Lake NWR in northeastern Nevada totaled 3.4 acre-ft/acre and 3.1 acre-ft/acre, respectively, for the May through September period in 2000 (Berger et al., 2001). The elevation of the valley floor at Ruby Lake NWR is about 6,000 ft, two thousand feet higher than Malheur NWR and this may be one reason for the higher ET rates at Malheur NWR. Dunne and Leopold (1996) report annual Class A pan evaporation rates of 4.5 to 5 feet in the area of Malheur NWR. Evaporation in natural water bodies is usually only 70 to 75% of Class A pan evaporation but the authors state that it can be as high as 90% or more in a shallow water body. The estimated evaporation rate derived using pan evaporation and pan coefficients in the 80-90% range is comparable to the 2003 ET rate estimated in the water budget. Higher pan coefficients may apply at West Knox Pond and other shallow, open water bodies at Malheur NWR.

Using the Jensen-Haise method, we estimated an ET rate for the May through September period of 4.1 acre-ft/acre in 2002 and 4.5 acre-ft/acre in 2003. The theoretical potential ET is less than our 2002 estimate and greater than our 2003 estimate. Over the 25-year period, the total May – Sept Jensen-Haise ET requirement ranged from a minimum of 3.3 ft in 1979 to a maximum of 4.5 ft in 2003 with a mean and median value of 3.8 ft. The interquartile range (25^{th} to 75^{th} percentile) for the 25-year record of Jensen-Haise ET is 3.6 to 3.9 ft.

For the 25-year period, the May-Sept Jensen-Haise predicted ET loss was the fourth highest in 2002 and the maximum in 2003. This is because of the high air temperature and solar radiation during those two years. The average July air temperature for 2002 and 2003 were warmer than 25-year average July air temperatures. Average May-Sept air temperatures were normal in 2002 and were the highest on record in 2003. A similar pattern exists for average monthly incoming solar radiation, which is expected because air temperatures are a thermal response to solar heating. Average May–Sept incoming solar radiation in 2003 and 2002 were the second and third highest on record.

SUMMARY

The Blitzen Valley has about 36,000 acres of irrigated area, including as much as 6,500 acres of open water ponds and wetlands. Aggregate consumptive use rates for the entire Blitzen Valley are between 1.3 and 1.7 acre-ft/acre for the irrigation season. Smaller areas within the Blitzen Valley generally have similar consumptive use rates. Actual irrigation diversion requirements might be somewhat higher than this because not all of the water diverted is used consumptively. The consumptive use rates are based on historical diversion, which are limited by water availability, refuge management, infrastructure constraints, and instream flow requirements. Diversions are greatest during the spring runoff period and are much reduced after July, when some fields are dried for haying and grazing. Seasonal and permanent wetlands that are maintained throughout the summer can have much higher consumptive use rates (as high as 4.0 acre-ft/acre or more) but the proportion of land in this kind of habitat in the Blitzen Valley is fairly small – less than 20%. One exception is in Krumbo Valley, where the ability to store and later divert water allows for a higher proportion of summer wetlands and ponds.

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Blitzen River Water Temperature Monitoring

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INTRODUCTION

Water temperature is one of the most important factors influencing the health of fish and other aquatic organisms (Coutant, 1976). The body temperature of fish fluctuates in response to the temperature of the aquatic medium in which they live. As a result, almost every response of fish, from spawning, feeding activity, and digestive and metabolic processes to distribution and survival is dictated by the thermal range of their immediate environment. Temperature can act as a lethal or stressing factor that ultimately kills fish; as a controlling factor that regulates growth and metabolism of fish; or as a limiting factor restricting activity and distribution of fish.

Great Basin redband trout appear to have adapted to function at warmer water temperatures than other trout (USFWS, 2000). Sustained temperatures greater than 21˚C are thought to be harmful, although redband trout are able to survive temperatures as high as 28˚C and fluctuations of as much as 20˚C over a 24-hour period (USFWS, 2000). The State of Oregon water quality standards states that the "seven-day-average maximum water temperature for streams identified as having redband trout use must not exceed 20.0° C " (ODEQ, 2007).

Water temperature in a given river reach is a function of the interaction of river conditions (channel width and degree of incision, riparian shading), hydrologic factors (stream discharge, tributary inflow, subsurface inflow), and meteorological variables (air temperature, relative humidity, solar radiation) (Bartholow, 1989). Refuge management practices can potentially affect many of these factors. Grazing practices, chemical treatment of invasive/noxious weeds, dredging, diking, channel straightening and other management actions can reduce riparian vegetation and shading. These actions may also affect the physical conditions of the stream channel by increasing width-to-depth ratios and channel incision. An incised stream channel may lower the groundwater table, reducing available water for riparian vegetation and changing subsurface hydrology. Irrigation diversions can reduce stream discharge. Irrigation and wetland return flows may be warmer than ambient river temperatures and can cause warming.

One purpose of this monitoring was to better understand the relationship between stream temperatures and water management on the refuge. A second purpose was to monitor compliance with state temperature standards established for waters in the Malheur Lake Basin. A third purpose of this work was to develop a temperature model of the system that could be used to examine the impact of various refuge management practices on river temperatures, including reduced river flows due to irrigation diversions; impounded river waters from diversion dams; irrigation return flows from wetlands and hayfields; and changes in riparian vegetation. The objective was to investigate the effectiveness of different management alternatives to improve river temperatures.

Stream Morphology and Restoration

The Blitzen River crosses the southern boundary of the refuge near Frenchglen, Oregon, where it exits from a narrow, confining canyon to a wide, flat valley (Figure 1). The river elevation gradient decreases from about 30 ft/mile in the canyon to about 12 ft/mile in the valley. Several decades of cattle grazing, removal of willows and other riparian vegetation, irrigation diversions, and channelization, have resulted in a severely degraded river and riparian system within the refuge (Landston, 2003). For the first five miles on the refuge, until the confluence with Bridge Creek, the river maintains a pool and riffle system with natural sinuosity. The river flows in what is probably a historic channel. According to an analysis by Sampson (2002), prior to 2002, this river reach was limited by a lack of bed formations, diverse depositional environments, cross-section variability, and woody vegetation abundance. The river was severely entrenched through this section and did not spill onto the floodplain, even at the flow of record (Sampson, 2002). Several irrigation diversion dams back up the river to supply water for adjacent meadows and wetlands: Page Springs Dam at the refuge boundary, New Buckaroo dam 2.5 mi downstream and Old Buckaroo Dam 2.9 mi downstream.

In the fall of 2002, restoration work was completed in the reach between Page Springs Dam and Bridge Creek (Sampson, 2002). This work included riparian vegetation planting, establishment of root wad revetments, and construction of rock weirs across the river. The FWS constructed seventeen rock weirs over roughly 3 miles between New Buckaroo Dam and the mouth of Bridge Creek. Construction of the weirs began in the fall of 2002 and was completed by March of 2003. The goal of this work was to increase in-stream habitat complexity, diversify hydraulics and sediment transport processes, increase friction to allow more sediment deposition, reactivate a portion of the floodplain and raise the water table below the surrounding meadows by aggrading the stream channel with the use of rock weirs. This water quality study attempted to monitor water temperature before and after this work, but unfortunately, the temperature recorder upstream of this restoration project malfunctioned in 2002 and the data could not be used.

Downstream of Bridge Creek, the Blitzen is straight and channelized for about 18 miles until Stubblefield Canal above Busse Dam (Figure 1). The river is entrenched along this reach and disconnected from its floodplain, resulting in a degraded riparian zone. There are two major diversion dams within this reach: Grain Camp Dam, 17.4 mi downstream of the boundary, and Busse Dam, 25.5 mi downstream of the boundary. Downstream of Busse Dam and Rocky Ford, the river returns to a slightly more meandering channel, although it remains deeply entrenched and lacks adequate riparian vegetation in this reach. Sodhouse Dam, at the end of this reach, is 44 mi from Page Springs and the southern boundary of the refuge. The river enters Malheur Lake, four miles downstream of Sodhouse Dam.

Water is diverted from the river mainly March through July at each of the diversion dams along the river, for irrigation of meadows and wetlands adjacent to the river. Some of this irrigation water makes its way back to the river as return flow, either in surface channels or as subsurface seepage.

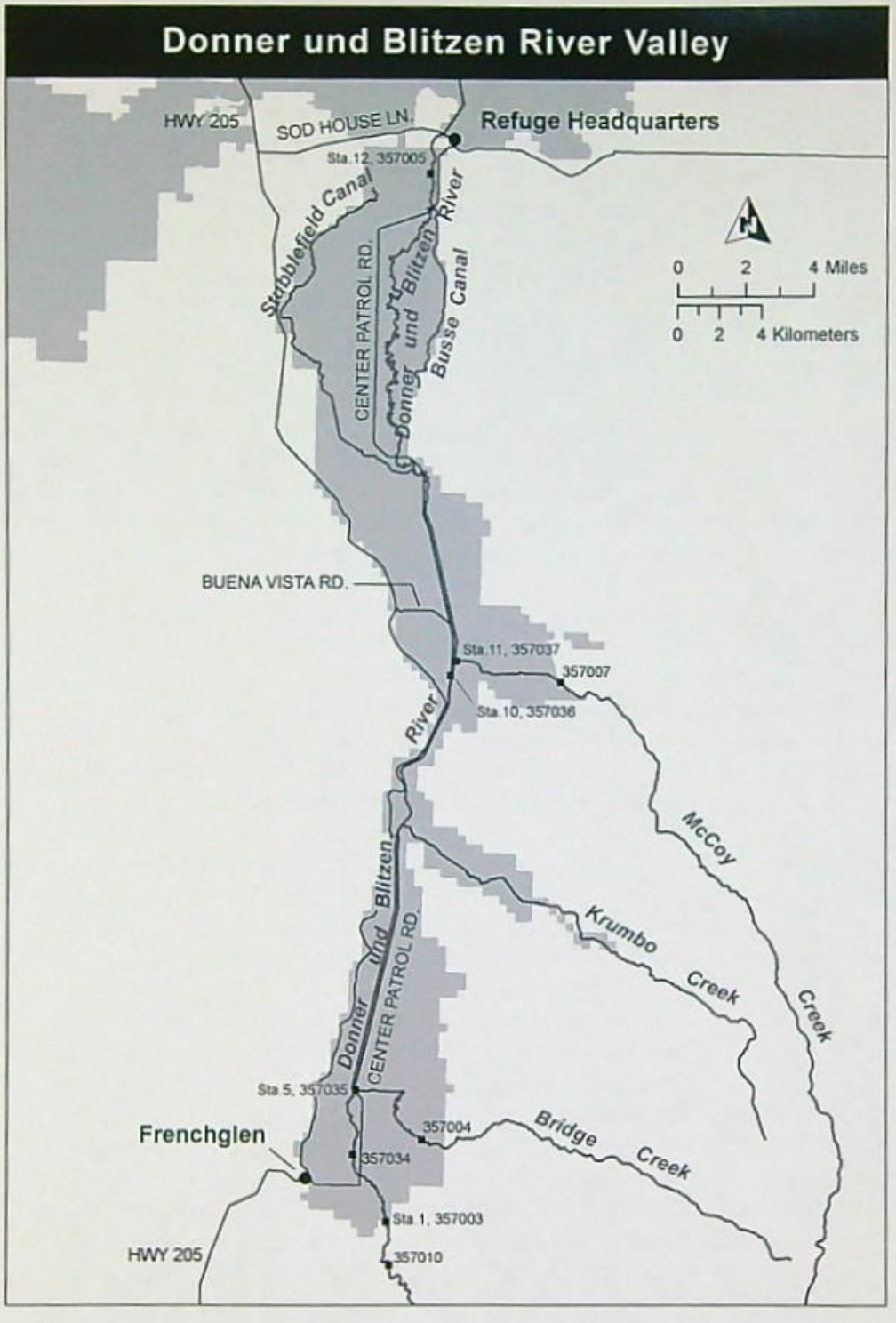

Figure 1. Map of Blitzen River Valley showing rivers and creeks, study monitoring sites, and several major landmarks and geographic features.

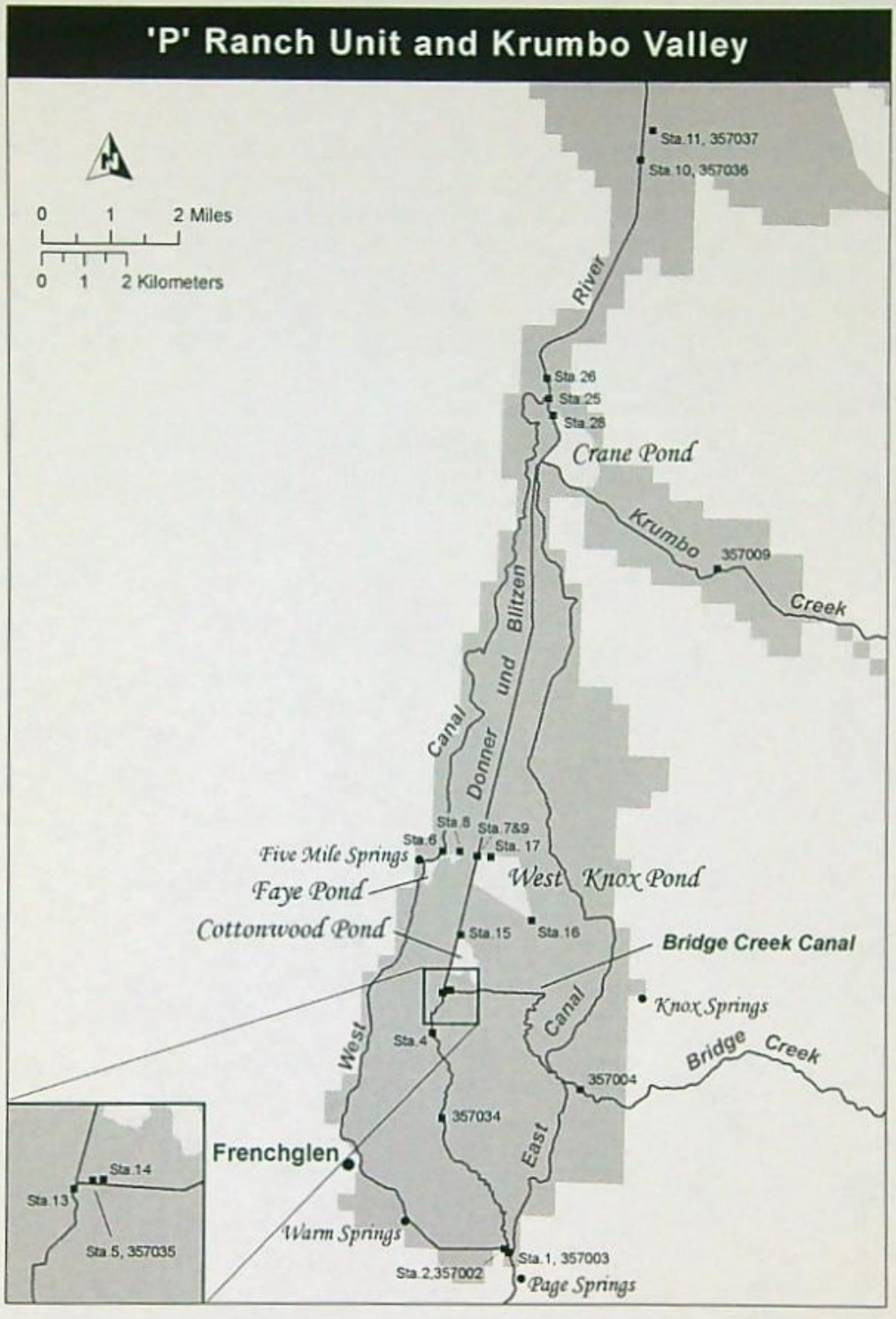

Figure 2. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

METHODS

We monitored water temperature at a number of stations along the Blitzen River in 2002, 2003, and 2005 and one site on Bridge Creek in 2003 (Figures 1 and 2). Table 1 lists the name, station number, and location of the river monitoring sites. Station 3 (Old Buckaroo, USFWS site no. 357034) was discontinued after 2002. Station 10, located just downstream of Grain Camp Dam and monitored in 2002, was moved 3 miles upstream of the dam to Station 26 in 2003 and 2005. In 2002 and 2003, we monitored temperature in the spring and summer periods. In 2005, we did not begin monitoring until late June.

Table 1. River Temperature Monitoring Sites

Station Number	Station Name	Distance downstream of Station 1 (mi)
1	Blitzen River blw Page Springs	0
3	Blitzen River at Old Buckaroo	2.9
13	Blitzen River at Bridge Creek	5.2
5	Bridge Creek at Blitzen	5.2
9	Blitzen River at 5-Mile Bridge	7.2
10/26	Blitzen River at Grain Camp	17.4 (Sta 10) / 14.5 (Sta 26)
12	Blitzen River blw Sodlhouse	44.0

Table 2. Irrigation Return Flow and Wetland Temperature Monitoring Sites

Station Number	Station Name	General location of Station
7	Faye Pond return flow channel	West side of Blitzen River just upstream of 5-Mi Bridge
17	West Knox Pond (permanent wetland)	East side of Blitzen River, south of Knox Drain Rd
28	Crane Pond (permanent wetland)	Adjacent to Blitzen River at downstream end of Krumbo Valley

We recorded water temperatures hourly using Optic StowAway temperature loggers, Optic Tidbits, and/or Hydrolab multi-probes. In addition, we made independent temperature measurements with a traceable thermometer at one or two week intervals during the monitoring period. If there were discrepancies between the independent and continuously recorded temperatures, we considered the continuous temperature data suspect and we removed them from the record for that period. We calculated daily averages, maximums and minimums from the hourly data. We also used air temperatures

and flow records in the analyses. We examined air temperatures from weather stations at P-Ranch (station ID: 726853) and Burns Municipal Airport (station ID: 726830) but ultimately, only air temperature data from Burns Municipal Airport were used because of significant gaps in the temperature record for P Ranch. Daily air temperatures at Burns are highly correlated with air temperatures at P Ranch. We used flow records from the following sites: the USGS Blitzen River at Frenchglen, OR; the FWS Blitzen River below Page Springs; the FWS Blitzen River below Grain Camp; and the FWS Blitzen River below Sodhouse.

Figure 3 shows the edited period of record by year for each temperature monitoring station on the Blitzen River. Gaps in the records represent loggers that malfunctioned or were lost, or poor quality data that were removed from the record. The first year of temperature monitoring, 2002, was especially problematic. This is part of the reason that we collected another season of data in 2005. Most of the 2002 summer period is missing for Station 1 (Blitzen River blw Page Springs) and Station 12 (Blitzen River blw Sodhouse). The temperature logger at Station 1 appeared to read too high for much of the summer of 2002, based on independent measurements, and the data were removed for the period. The logger at Station 12 was lost in 2002. Unfortunately, these two sites represent the entry and exit points of the river on the refuge, which are critical to the analysis of temperature impacts. Another major data gap in the temperature record occurs in the first half of the 2005 summer for Station 12. For reasons unknown, the temperature logger did not record any data for this period.

In addition to the river monitoring sites, we monitored water temperatures from several wetlands in the Frenchglen area in 2002 and 2003 (Table 2). These included Faye Pond and West Knox Pond in 2002 and 2003 and Crane Pond in 2003. Temperatures were collected near the wetland outlets from April to the end of summer, or until the return flow from the wetlands ceased or the wetland became too shallow. Water temperatures at the outlets were assumed to represent temperatures of return flows reaching the river, although at some sites, return flow channels between the outlets and the river are several hundred yards in length, which may allow some additional heating.

We calculated seven-day average maximum temperatures from the daily maximums for all sites and periods with continuous hourly data between June 1 and Sept 30. We determined the number and percentage of days exceeding the state standard within this period. We assessed the magnitude of exceedences by calculating cooling degree days, using 20°C as a base, at all sites with a complete record for the June to Sept period. Cooling degree days are defined as the cumulative sum of the difference between the 7-day average maximum temperature and the base (20°C) for all days exceeding 20°C.

Water temperatures in rivers vary diurnally, seasonally, and annually in response to stream channel conditions, hydrology, and meteorology. Channel conditions on the refuge are progressively impacted downstream by the combined effects of diversions dams, irrigation return flows, channel incision, and channelization. Hydrology and meteorology were significantly different during the three years of monitoring. Therefore,

we were able to examine the effect of each of these factors looking at variations in temperatures among years and longitudinally along the river.

We used several statistical methods to analyze the data. Linear regression was used to relate water temperatures to air temperatures. A 3-day running mean air temperature was used in the correlations to smooth some of the daily fluctuations from the air temperature record. Analysis of covariance (ANCOVA) was used to analyze for differences in slopes and/or intercepts of regressions between seasons (spring runoff/summer baseflow) and between years (2002, 2003, 2005). In ANCOVA, the data are assigned to groups and multiple regressions were performed with all the data using a binary variable to represent the groups. In this case, the groups represent either seasons or years. For seasonal comparisons, data from May 1 to June 15 were used for the spring season and July 15 to Sept 30 for the summer season, to avoid the transition period from runoff to baseflow. Two multiple regression models are used in ANCOVA, one to test for a difference in intercepts between the groups and the second to test for a difference in slopes and intercepts between groups.

We used a t-test (or a Mann-Whitney test) to test for significant differences in means (or medians) between groups. We used a paired t-test (or Wilcoxon signed rank test) to test for significant differences in means (or medians) between paired groups of data. Where two sources of water were mixed, we used the mixing equation to estimate the combined temperature:

$$T_j = \frac{Q_1 * T_1 + Q_2 * T_2}{Q_1 + Q_2}$$

where

T_j = temperature at junction
Q_n = discharge at source n
T_n = temperature at source n

Finally, we used SSTEMP Version 2.0 (Bartholow, 2002), a simple one-dimensional, steady-state, stream segment model, to further investigate temperature relationships along this reach and examine refuge management alternatives to improve water temperatures. SSTEMP handles only single stream segments for a single time step (day, month, etc.) for a given run. Batch model runs can be executed through a comma-delimited input file. Based on input describing stream geometry, location, elevation, shading and steady-state hydrology and meteorology, the model predicts the daily mean and maximum stream temperatures at specified distances downstream. In general terms, it calculates the heat gained or lost from a parcel of water as it passes through a stream segment. The theoretical basis for the model is strongest for mean daily stream temperature, as opposed to daily maximum or minimum daily stream temperatures.

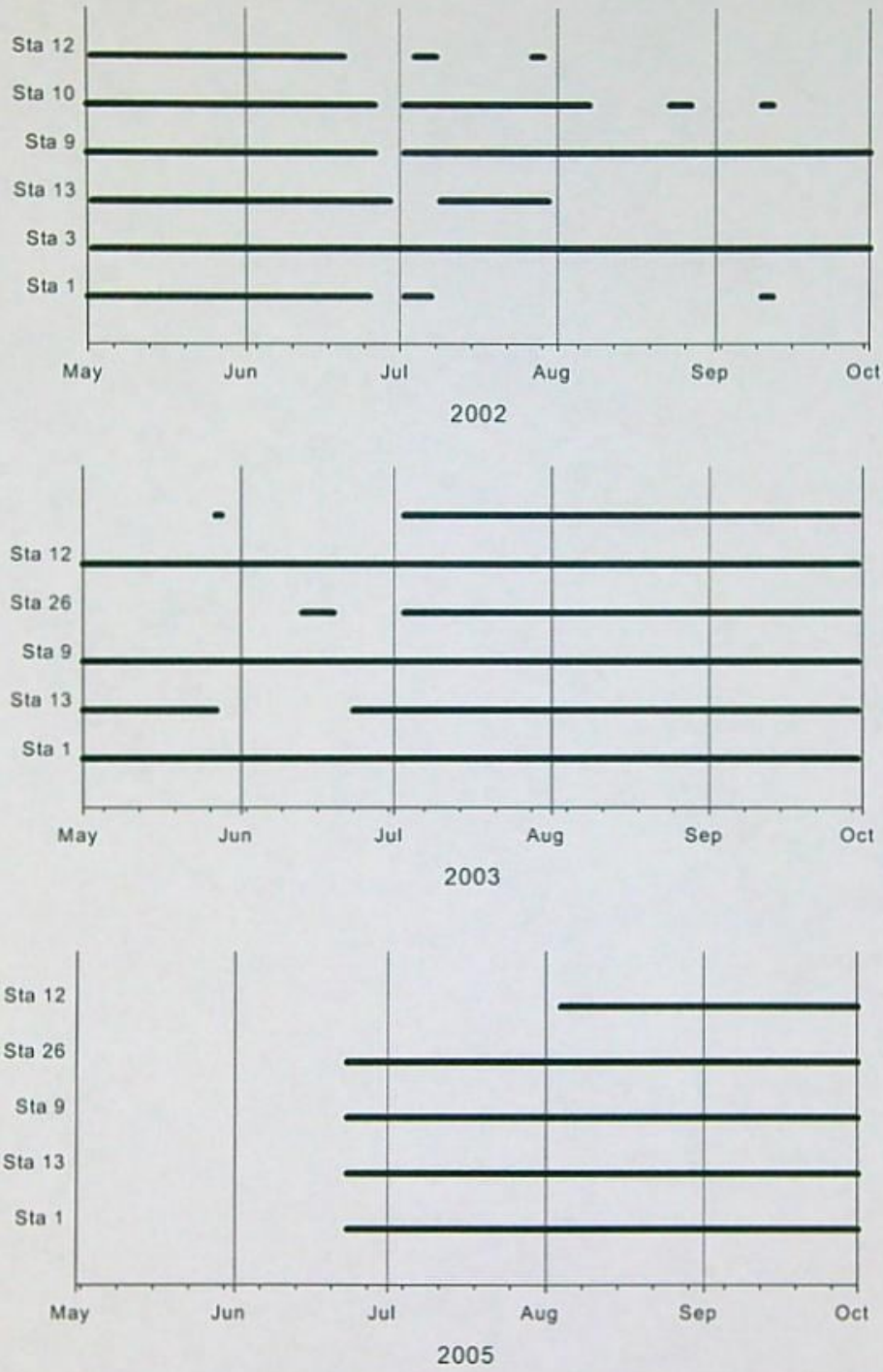

Figure 3. Period of record for all Blitzen River temperature monitoring stations during the three years of study.

We modeled river temperatures for the river reach from Page Springs Dam to 5-Mile Bridge for a 35-day period from July 1 to August 4, 2003. We selected this period because temperature and flow data were available from a number of river and wetland sites and because it was particularly warm during the period. We calibrated the model using daily average and maximum temperatures for Station 13 (Blitzen River above Bridge Creek) and Station 9 (Blitzen River at 5-Mile Bridge). Since SSTEMP only models a single reach at a time, data were input for three individual segments of the river for the reach from Page Springs to 5-Mile Bridge, with output from one segment used as input for the next downstream segment.

We delineated segments based on the presence of irrigation diversions, tributary inflows, or the availability of flow and temperature data at sites. The first segment was from Page Springs to New Buckaroo Dam, because irrigation diversions reduce the flow past this site for part of the period. The second segment was from New Buckaroo dam to Station 13, because we had temperature and flow data at this site and Bridge Creek flows into the Blitzen just downstream of this site. The third segment was from Station 13 to Station 9 at 5-Mile Bridge, where we also had temperature and flow data.

The model predicted water temperatures for the first segment above New Buckaroo Dam, which was then used as input, along with the estimated diversions and return flows in the second segment from New Buckaroo Dam to Station 13, to predict daily water temperatures at Station 13. These model temperatures for the second segment at Station 13 were "mixed" with Bridge Creek tributary inflow, using the mixing equation above, and used these as model input along with estimated return flows, to predict daily water temperatures for the third segment at Station 9, the Blitzen River at 5-Mile Bridge. We used the measured daily average temperatures at Station 13 and Station 9 to independently check the model output and calibrate the model.

RESULTS AND DISCUSSION

Hydrological and Meteorological Conditions in 2002, 2003, and 2005

Figure 4 shows the Apr-Sept Blitzen River flows at several flow monitoring sites for the three years of temperature monitoring. The four sites, from upstream to downstream are 1) the USGS Blitzen gage upstream of the refuge, 2) the Blitzen below Page Springs, 3) the Blitzen below Grain Camp, and 4) the Blitzen below Sodhouse. In most years, the runoff period on the Blitzen typically extends from April through May or June and the baseflow period begins sometime in July. Peaks in flow at the downstream sites are attenuated and delayed relative to the upstream sites. Flow generally decreases in the downstream direction due to diversions and losses on the refuge. About the 3rd week of July, the FWS stops most diversions on the refuge and flows at the downstream sites usually increase and become approximately equal to the upstream sites.

The three years of temperature monitoring spanned a range of flow conditions. According to the stream ranks presented in the previous section of this report, the April to September runoff measured at the USGS Blitzen River gage was below normal in 2002 and 2003 and above normal in 2005. Total April-September runoff was 49,565 af in 2002 (31st percentile of all years), 55,509 af in 2003 (41st percentile of all years), and 78,140 af in 2005 (75th percentile of all years). Average baseflow for July 1 to September 30 was 43 cfs in 2002, 40 cfs in 2003, and 55 cfs in 2005. 2003 had greater April to September runoff but smaller average baseflow as compared to 2002. Of the three years, 2005 has the highest April-September runoff and average baseflow. In general, higher river flows should mean cooler water temperatures.

Air temperature is the single most important influence on stream temperature, particularly when stream flow is low and width-to-depth ratios are high (Bartholow, 1989). Crisp and Howson (1982) found that they could explain 86% to 96% of the variance in water temperatures from several streams with linear regressions containing only mean air temperatures. The addition of rainfall or stream discharge did not improve the regressions. Smith and Lavis (1975) reported a similar relationship between air temperature and water temperatures in several other streams.

The average Jun-Sept air temperature at Burns Municipal Airport was 17.7˚C in 2002, 18.9˚C in 2003, and 17.1˚C in 2005. Two-sample t-tests of all pairs of means indicated that the Jun-Sept period in 2003 was significantly warmer than 2005 ($p=0.005$) but not significantly different from 2002 ($p=0.054$). There were 116 cooling degree days in 2002, 152 in 2003, and 106 in 2005. 2003 was much warmer than 2002 or 2005, with a higher mean summer temperature and a greater number of cooling degree days. As discussed in the previous *General Water Budgets for Malheur NWR* report, the average May-Sept air temperatures in 2003 are the highest on record for the period from 1979 to 2005. In addition, 2003 had the lowest average baseflow of any of the three years. As well as having the highest runoff and baseflow of the three years with temperature monitoring, 2005 was the coolest summer.

Water Temperatures in 2002, 2003, and 2005

Daily mean air and water temperatures for 2002, 2003, and 2005 are presented in Figure 5 for river and wetland monitoring sites. Daily air temperatures generally reached their annual maximums around mid-July/beginning of August. River temperatures follow the trend in air temperatures closely, increasing rapidly as runoff recedes in late June, peaking in mid-July/beginning of August, and then decreasing. River temperatures become warmer earlier in the season with distance downstream, suggesting that river conditions on the refuge are conducive to warming. The warmest site on the river is Station 12 (Biltzen below Sodhouse Dam), which is the furthest downstream monitoring site.

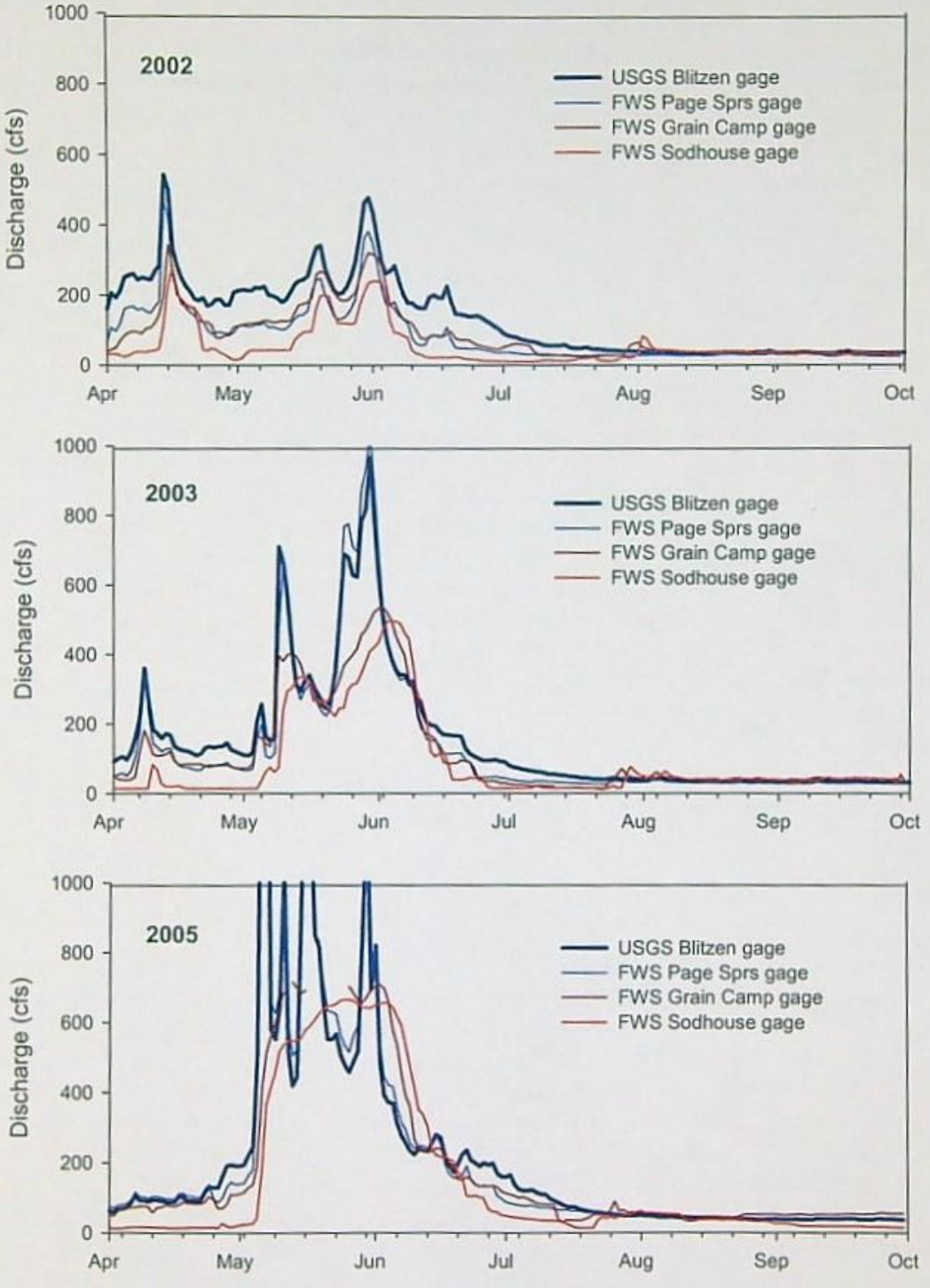

Figure 4. Blitzen River daily flows at USGS gage, Page Springs Dam, Grain Camp Dam, and Sodhouse Dam for Apr-Sept, all three years.

Water temperature is strongly correlated with air temperature at all river monitoring sites, especially in the summer baseflow period (Figure 6). Air temperature explains from 82 to 85% of the variance in Jul-Sept water temperatures for all three years. One can observe the effect of higher river flows in the different response of river temperatures to air temperatures during spring runoff and summer baseflow. Figures 6a and 6b present linear regressions of daily water temperature with 3-day average air temperatures at several sites during spring runoff (May 1-Jun 15) and summer baseflow (Jul 15-Sept 30) for 2002 and 2003. In general, river temperatures are higher for a given range of air temperatures under baseflow conditions than runoff conditions. The difference between the two periods is smaller at sites further downstream. ANCOVA indicated the slopes and intercepts of the regressions are statistically greater during the baseflow period ($p<0.05$), with the exception of Station 12 in 2003. These results suggest that water temperatures are warmer and increase more rapidly for a given range of air temperatures during the baseflow period as compared to the runoff period.

The median Jul-Sep discharge below Page Springs Dam was 30 cfs in 2003 and 41 cfs in 2005. Despite the higher baseflow in 2005 compared to 2003, we found no statistically significant differences in the slopes or intercepts of the regressions when summer baseflow (Jul-Sept) temperatures were grouped by years. However, looking at July alone, when the difference in median flows was greater for the two years (median July flows of 32 cfs and 61 cfs, respectively), there was a significant difference in the intercepts of the regressions, suggesting that the higher baseflow in July 2005 had an effect on the air/water temperature relationship. Mean daily river temperatures at Station 9 were about 0.75 to 1.5°C cooler for a given range of air temperatures in July 2005 versus July 2003. Daily maximum temperatures were about 2 to 4°C cooler in 2005. The temperature modeling results discussed below examine the effect of increased flows further.

Figure 5 also shows wetland water temperatures for 2002 and 2003. Wetland water temperatures behave very similarly as a group and generally warm more rapidly than river temperatures from mid-May to early July. The water in the wetlands has a long residence time in shallow, unshaded water bodies, giving it ample opportunity to equilibrate with air temperatures. Water temperatures in 2003 at Station 5 (the downstream end of Bridge Creek) were also warmer than the Blitzen River and similar to wetland water temperatures (Figure 5). Although this is a spring-fed stream, the channel flows through a very low-gradient, 2-mile section with numerous wetlands known as the Bridge Creek Canal, between East Canal and the mouth of Bridge Creek. Water temperatures increase considerably through this reach. In August 1999, water temperatures in Bridge Creek were about 12°C six miles upstream of the confluence with the Blitzen River, 18°C at the upstream end of Bridge Creek Canal, and 22°C at the mouth of Bridge Creek (Watershed Sciences, 2000). Overall, water temperatures in the wetlands and canals adjacent to the river appear to reach equilibrium with air temperatures much earlier than the river, especially upstream Blitzen River sites. The

Blitzen below Page Springs and other upstream sites on the river are much slower to increase until the beginning of July, when runoff flows have receded.

Figure 7 shows the increase in median Jul-Sept water temperature with distance downstream in 2003 and 2005. Jul-Sept water temperatures warm about 4.2˚C in 2003 and 3.2˚C in 2005 through the entire extent of the refuge and this difference is statistically significant ($p<0.002$). The most rapid rate of increase appears to occur between Stations 1 and 13, in the first 5 miles of the refuge. Temperatures increased 0.36 and 0.16˚C/mile for 2003 and 2005, respectively, in this reach. Temperature increases are less, ranging between 0.05 and 0.10 ˚C/mile, over the remaining length of the refuge. This is somewhat surprising since the channel conditions in the first five miles appear to be much better than further downstream, especially following the restoration in 2002. There may be several reasons for this.

First, the river transitions to lower gradient conditions as it enters the refuge from the canyon. Riparian and topographic shading is greatly reduced in the valley as compared to the canyon upstream. The abrupt changes in channel and topographic conditions may mean that river temperatures are far from equilibrium with air temperatures as the river enters the refuge. One would expect a rapid response under such conditions, as water temperatures attempt to equilibrate with air temperatures. Further downstream, as water temperatures near equilibrium, the response will be slower and warming will not be as rapid.

Another contributing factor for the rapid warming in this reach of the river and elsewhere could be warmer tributary flow from Bridge Creek Canal and return flow from adjacent wetlands (Faye Pond, West Knox Pond, and Crane Pond). However, Station 13, located on the Blitzen River upstream of Bridge Creek and upstream of most wetland return flow, appears to be warming more than would be expected based solely on the mixing of river waters and estimated wetland return flows upstream of this site. At least at the present time, it appears that in the first five miles of the refuge, reduced topographic and riparian shading is responsible for the warming observed in the Blitzen River, rather than wetland return flows and tributary inflow from Bridge Creek. The modeling results described below confirm that tributary inflow and return flows are not significantly warming the river under the current conditions in this reach.

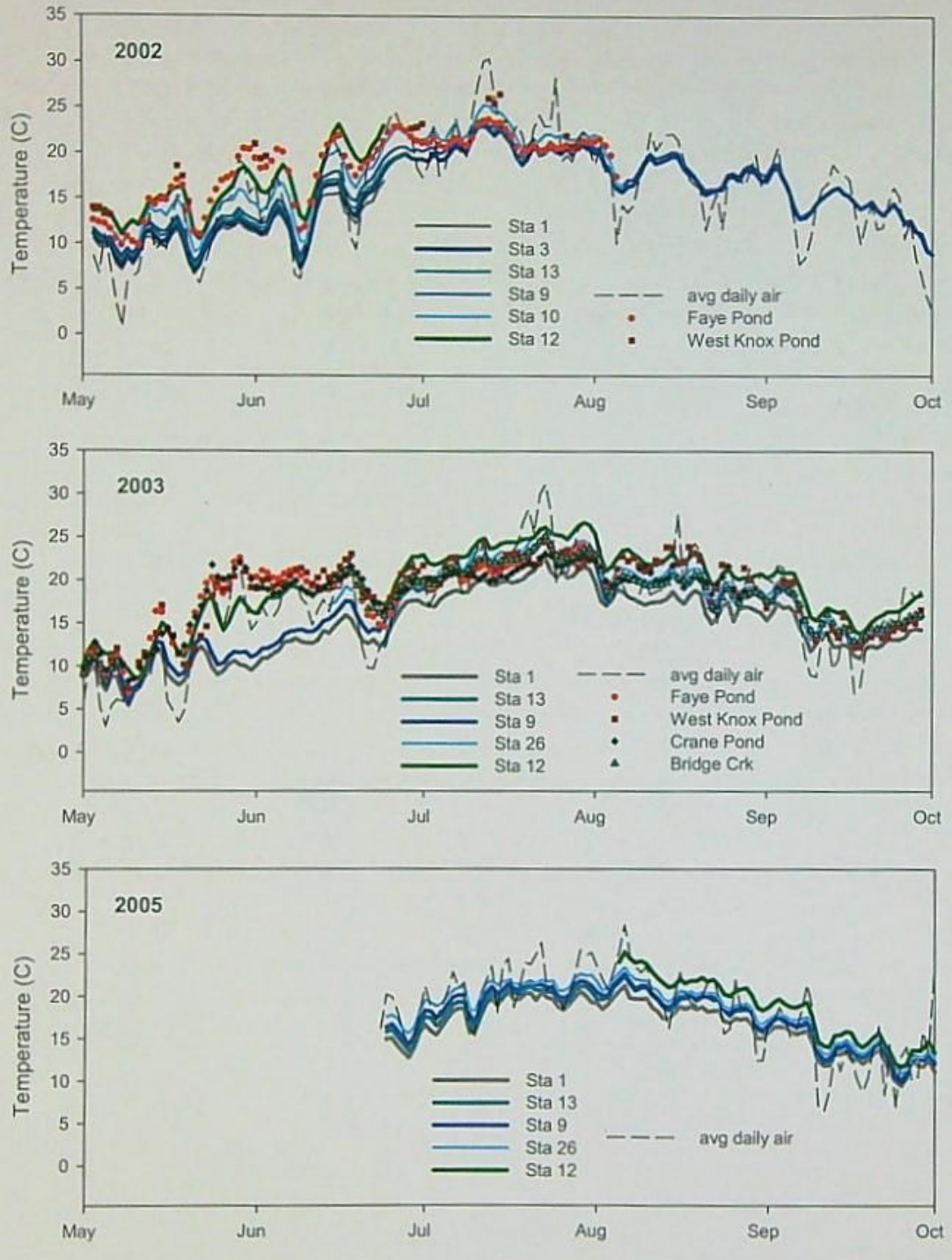

Figure 5. Average daily air temperature and water temperatures for the river monitoring stations for all three years and the wetland sites for 2002 and 2003.

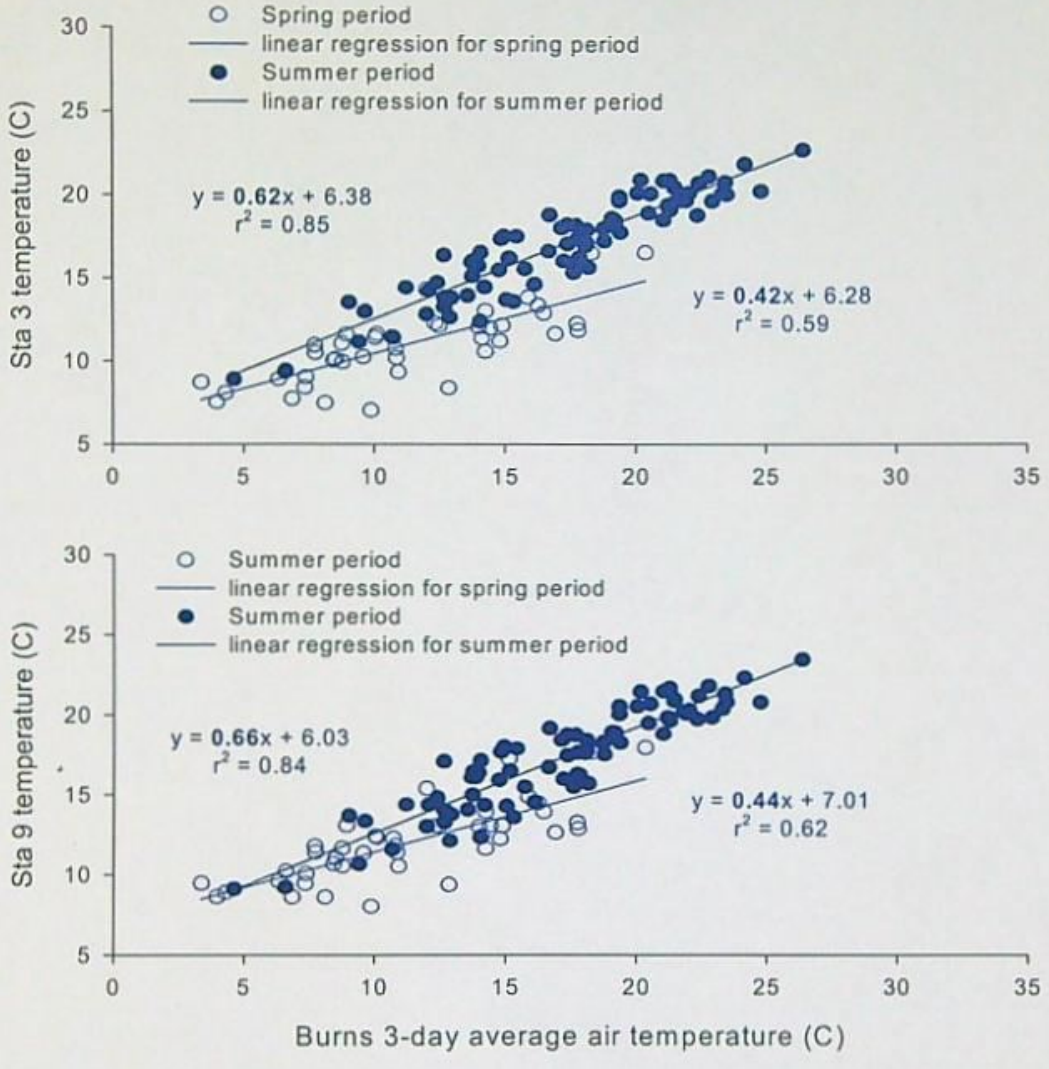

Figure 6a. Regressions of 3-day average air temperature and river water temperatures for spring runoff (May 1-Jun 15) and summer baseflow (Jul 15-Sept 30) periods in 2002.

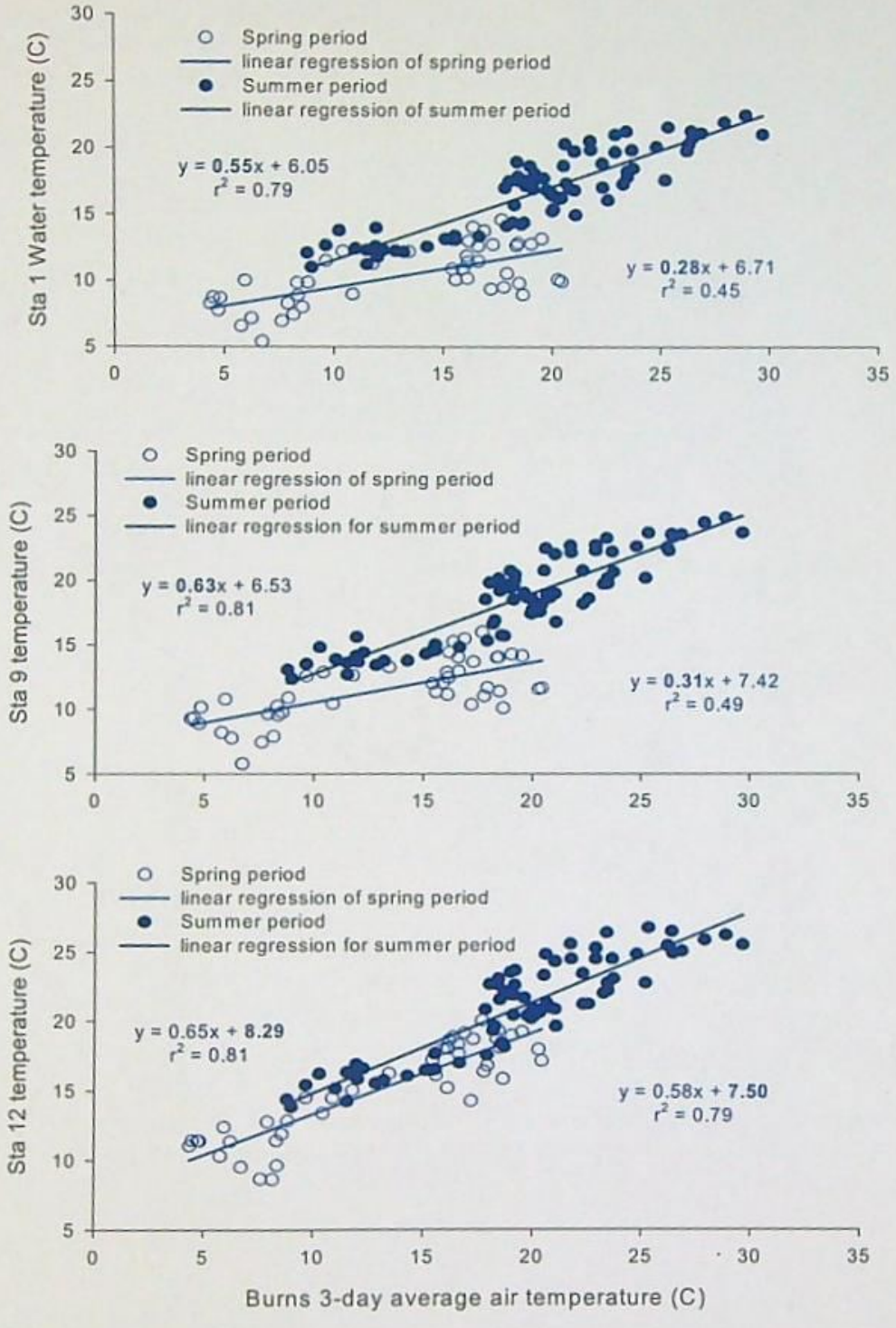

Figure 6b. Regressions of 3-day average air temperature and river water temperatures for spring runoff (May 1-Jun 15) and summer baseflow (Jul 15-Sept 30) periods in 2003.

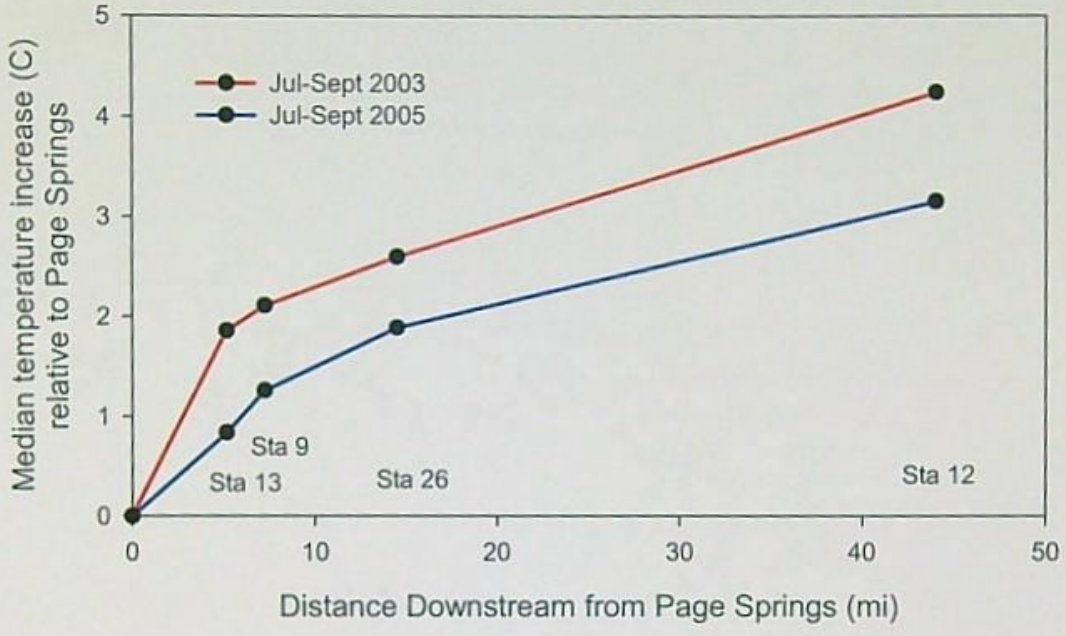

Figure 7. Increase in Jul-Sept median temperature with distance downstream from Page Springs for 2003 and 2005.

Water temperatures at Station 12 (Blitzen River below Sodhouse Dam), the furthest downstream site on the refuge, reflect the combined influence of warmer tributary and return flows sources, decreased flows due to diversions, low-gradient channel conditions, and reduced riparian shading. Several low-gradient tributaries and return flows from numerous wetlands and hayfields in the Blitzen Valley enter the Blitzen River along the entire reach through the refuge upstream of Sodhouse Dam. Station 12 water temperatures increase more quickly in the spring in comparison to upstream sites. Water temperatures become equal to wetland and tributary temperatures in early June and they begin to exceed these temperatures in early July. Return flows decrease considerably through the summer as diversions for irrigation cease, so the effect of these sources on river temperatures later in the summer should be negligible. The rapid warming in the river observed at downstream sites during late spring and early summer is likely due to the combined effect of return flows, irrigation diversions, channel conditions, and reduced shading.

The 7-day average maximum exceeded the Oregon state standard of 20°C at all sites for a considerable period of each summer of temperature monitoring. Table 3 presents the number of days of exceedences by year for each station that had a complete record over the summer period. The number of days with exceedences increased in a downstream direction, but even the water entering the refuge exceeded the state standard for a significant period each year. The Blitzen River below Page Springs Dam had 68 and 58 days with exceedences for 2003 and 2005, respectively. Downstream sites had progressively more days with exceedences. The maximum number of days with exceedences was 83 in 2003 at the Blitzen below Sodhouse Dam.

Table 3. Number of Days Exceeding the State Temperature Standard (20°C) at each Station for 2002, 2003, and 2005 (NA indicates an incomplete record for that station during that year)

Station Number	Station Name	2002	2003	2005
1	Blitzen River blw Page Springs	NA	68	58
3	Blitzen River at Old Buckaroo	53	Station discontinued	
9	Blitzen River at 5-Mile Bridge	76	73	66
10/26	Blitzen River at Grain Camp	NA	NA	58
12	Blitzen River blw Sodlhouse	NA	83	NA

The number of days with exceedences is a measure of the frequency of high temperatures. The magnitude of high temperature exceedences during a given period is also important to fish and other aquatic organisms. Cooling degree days generally increased downstream, although there were problems with computing this cumulative measure because of the gaps in the record for some sites. The conclusion is that both the frequency and magnitude of exceedences increase downstream.

Spring inflow from Page Springs has a small but significant cooling effect on river temperatures. Measurements collected with a temperature sensors upstream and downstream of Page Springs during August 2005 indicated that, on average, the river was 0.2°C cooler downstream of the springs (p=0.000). Blitzen flows upstream of Page Springs averaged 41 cfs in Aug 2005 and estimated Page Spring inflows averaged 14 cfs in Aug 2005. To cool the water the observed amount (0.2°C), the estimated water temperature of the spring inflow would have to be about 0.8°C cooler than the river upstream, which appears reasonable when compared to instantaneous observations of spring water temperatures in Aug 2005.

Modeling Results

We used the topographic and riparian shade components as the primary calibration variables for the SSTEMP model, since most other input variables for the model are known. We assumed a shade-producing strata of trees 10 ft high and 10 ft in crown diameter with trunks positioned 10 feet back from the water, and having a density of 21%. The density term refers to both the continuity of the vegetation along the channel and the light-filtering ability of the vegetation. Assuming that about 25% of the stream bank is vegetated with willows and other local riparian vegetation and this vegetation screens about 85% of the sunlight, the computed density is 21% (0.25*0.85=0.21). The resulting model-calculated total shading value, or the percent of the water surface that is shaded through the day, is 9%. This is low but may be realistic for the refuge, given the sparse riparian vegetation that exists presently and the channelization and grazing practices that have occurred historically (Langston, 2003). The predicted and measured daily average temperatures at 5.25 miles at Station 13 and 7.25 miles downstream at Station 9 for the period Jul 1 to Aug 4, 2003 are shown in Figure 8. Predicted and measured average temperatures agree fairly well for the period (r^2=0.97 and 0.86, respectively). The agreement between predicted and measured maximums at Stations 13 and 9 is weaker (r^2=0.64 and r^2=0.74, respectively) and appears slightly biased. As discussed in the Methods section, the theoretical basis for the model is strongest for mean daily stream temperature. The poorer estimates and weaker correlations for maximum temperatures are not unexpected for this reason.

For our purposes, this calibration is adequate. The point of this modeling exercise was to create an input dataset that reasonably simulated observed temperatures downstream and then to examine the effect of various management alternatives on water temperatures. Alternatives examined included the effect of additional flow, the effect of additional riparian shading, and the effect of reduced tributary and return flow.

Table 4 presents the medians of predicted temperatures for the Jul 1 to Aug 4, 2003 period at Station 13 and Station 9 for current conditions and for each management alternative. Figure 9 presents the predicted daily average and maximum temperatures at Station 9 graphically for the current conditions and for each management alternative.

The first and second management alternatives we modeled (Alt 1 and 2) increased flows below Page Springs Dam by 15 cfs and by 30 cfs, respectively, which are 50% and 100% greater than the measured median flow below Page Springs Dam for the Jul 1 to Aug 4, 2003 period of 32 cfs. The increases could possibly be accomplished through reduced diversions, assuming the water is available at the refuge boundary. The model carried the additional flow through all segments and predicted the resulting mean and maximum temperatures at Station 13 and 9. With additional flow in the river, the water temperatures are significantly cooler for the Jul 1 to Aug 4, 2003 period (Table 4). Predicted daily means and maximums at Station 9 are 0.5°C and 0.9°C cooler with 15 cfs of increased flow (Alt 1) and 0.7°C and 1.5°C cooler with 30 cfs of increased flow (Alt 2) for the period. The modeled reductions in mean and maximum temperatures at Station 9 under Alt 2 are nearly equal to the observed reductions at Station 9 between July 2003 and July 2005, two periods which had flow differences equivalent to those modeled here.

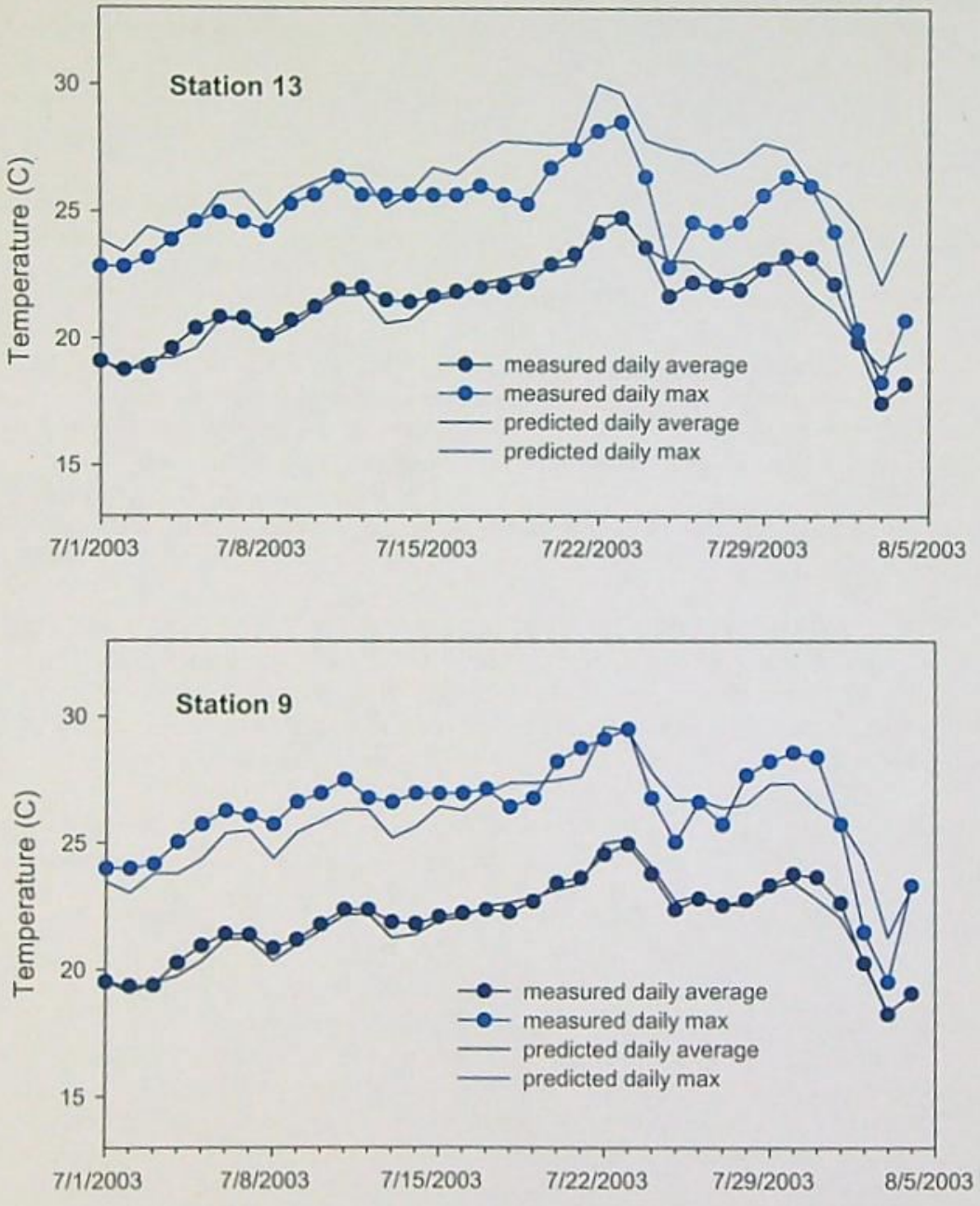

Figure 8. Measured and predicted water temperatures at Station 13 and Station 9 for the period Jul 1-Aug 4, 2003.

Riparian shading is another important factor that could be affected through refuge management. Under current conditions, the model calculated a total shading of 9% with the initial input parameters we assumed for riparian vegetation. To test the effect of shading, we modeled Alt 3 which increased the total shading by assuming that 80% rather than 25% of the stream bank is occupied with vegetation. We also increased the height of the vegetation from 10 feet to 15 feet and moved the trunks of the trees from 10 feet to 5 feet from the water. Assuming that the vegetation still screens about 85% of the sunlight, Alt 3 resulted in a vegetation density of 68% (0.80*0.85=0.68) and a model-calculated total shading of 27%. With this change in riparian vegetation, the predicted daily mean and maximum river temperatures at Station 9 are 1.0˚C and 1.8˚C cooler than measured temperatures for the period (Table 4).

Next, we modeled the combined effect of the increased shading described above and flow increases of 15 and 30 cfs (Alt 4 and 5). With the increased riparian vegetation and 15 cfs of additional flow (Alt 4), the predicted mean and maximum river temperatures at Station 9 are 1.3˚C and 2.5˚C cooler for the period. With the increased riparian vegetation and 30 cfs of additional flow (Alt 5), the predicted mean and maximum river temperatures at Station 9 are 1.4˚C and 2.9˚C cooler than measured temperatures for the period (Table 4, Figure 9).

Another management alternative would be to reduce the tributary inflow and return flows reaching the river (Alt 6), since these waters appear to warm up more quickly than the river in early summer. Practically, it would be difficult to reduce or eliminate all tributary and return flow but we wanted to investigate the effect of tributary and return flow contributions using the model. When we modeled daily water temperatures with no tributary and return flow within the entire reach, there was almost no change in daily means or maximums compared to measured water temperatures for the period. The differences between Alt 6 and the current conditions were quite small and at Station 9, not significantly different from zero ($p=0.238$). The model results from Alt 6 suggest that the observed water temperature increase in the first 7.2 miles of river occurs because the river is equilibrating to air temperatures and new channel conditions on the refuge, not because of warmer tributary and return flows.

Reducing tributary and irrigation return flows in this reach would produce marginal benefits in terms of river temperatures and would come at a cost in terms of management flexibility and biologic productivity. Practically, it would be difficult to reduce or eliminate all tributary and return flow. These sources do not seem to be that important to river temperatures, at least under the current conditions considered in this reach. However, they may be more important at downstream sites, particularly Station 12, the Blitzen below Sodhouse Dam.

For the first five management alternatives examined, the daily maximum water temperatures are affected more significantly than the daily average temperatures (Figure 9). While the accuracy of the SSTEMP model is less for maximum water temperature predictions, it seems reasonable to assume that the relative affect of any management change would be greater for maximum water temperatures than for average water

temperatures. This is important to consider because the maximum water temperatures are probably of most concern for fish and the water quality standard is based on maximums.

Table 4. Medians of Modeled Temperatures under Management Alternatives at Station 13 and 9 for the Period Jul 1 to Aug 4, 2003*

	Sta 13 daily mean	Sta 9 daily mean	Sta 9 daily max
Current conditions	21.7	22.1	26.3
Alt 1 – increase flow 15 cfs	21.3	21.6	25.4
Alt 2 – increase flow 30 cfs	21.0	21.3	24.8
Alt 3 – increase riparian veg	20.8	21.1	24.5
Alt 4 – increased riparian veg with 15 cfs	20.6	20.8	23.8
Alt 5 increased riparian veg with 30 cfs	20.5	20.7	23.4
Alt 6 – eliminate all tributary and return flows	21.6	21.8	26.3

*The median differences between all paired observations under current conditions and each alternative were all found to be statistically significant with p values = 0.000, except for Station 9 daily means under Alternative 6. Maximum temperatures are presented for Station 9 but not Station 13.

The benefit of higher flows alone on water temperatures is small under the range of flows and conditions considered here. Furthermore, any such increase would mean reduced diversions to the wetlands on the refuge. The costs associated with reduced diversions would need to be carefully weighed against the degree of cooling expected to be realized in the river. One advantage of increased flows is that they can be implemented relatively quickly.

Improved riparian shading, as modeled under alternative 3, appears to be very effective at cooling river temperatures, even more so than increasing flows by as much as 30 cfs. The assumed changes in riparian vegetation seem feasible, although they would take time to implement. Riparian shading offers multiple terrestrial shading and it is likely that there would be additional benefits to aquatic habitat and channel conditions. Some combination of increased flows and improved riparian shading is the most effective alternative for reducing Blitzen River temperatures. Flows increases could be greater in the first few years until conditions in riparian shading improved. Even with better shading and more flow, the water temperature standard would still probably be exceeded, but the frequency, and likely the magnitude, of exceedance would be less. Blitzen River temperatures downstream of Station 9 will likely be quite warm, verging on or exceeding the standard of 20°C, unless channel conditions and riparian vegetation are improved throughout the entire refuge. The important point with these results is that any management attempts to improve Blitzen River temperatures should begin at the furthest upstream reach on the refuge, where temperatures warm most rapidly.

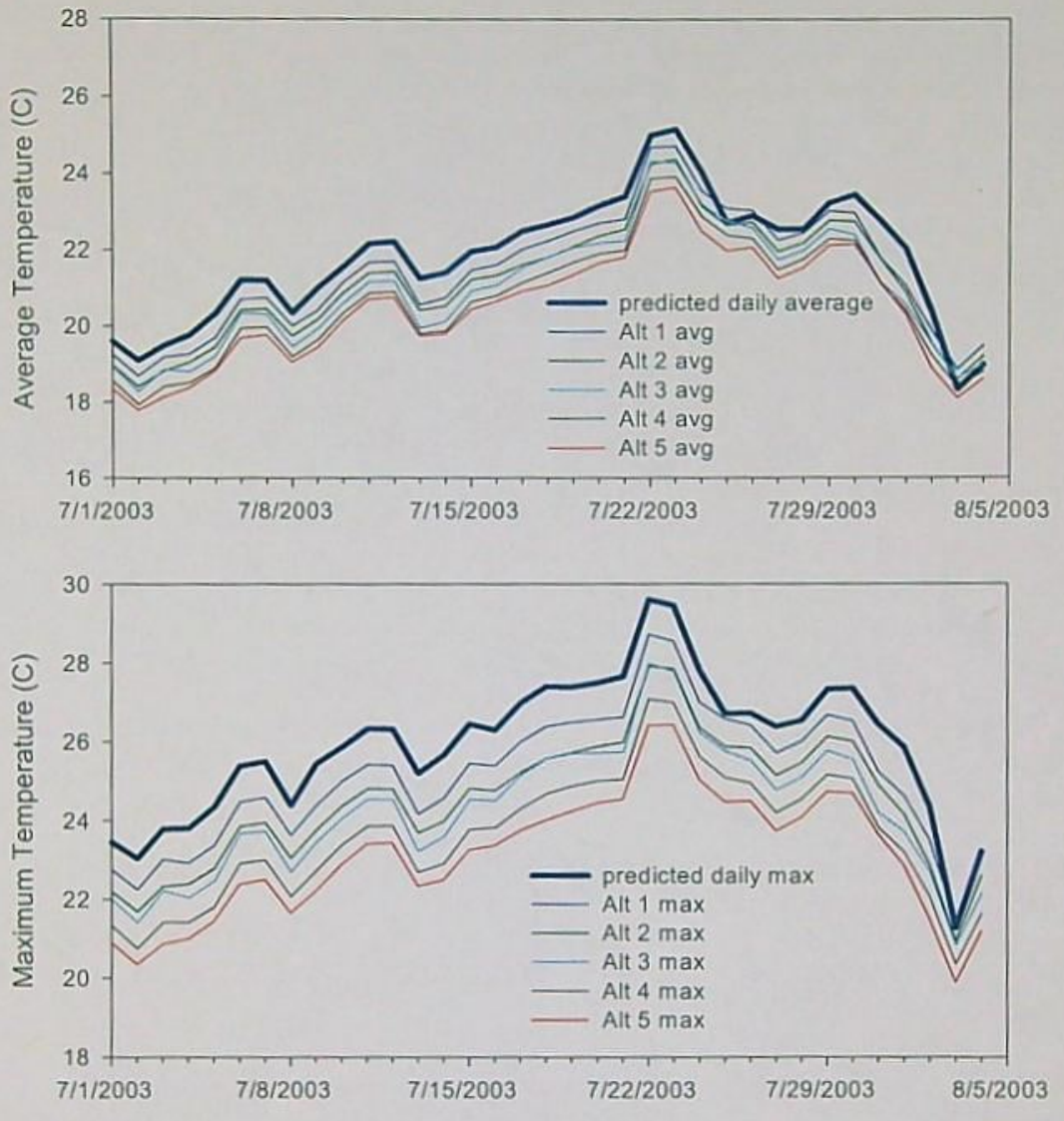

Figure 9. Predicted daily average and maximum temperatures under current conditions (bold line) and for five different management alternatives (described in Table 4 and in the text) for the period Jul 1-Aug 4, 2003.

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Water Quality in the Blitzen River Valley at Malheur NWR

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U.S. Fish and Wildlife Service

INTRODUCTION

The purpose of this report is to describe and evaluate the existing water quality conditions in the Blitzen Valley at Malheur NWR. We examine water quality in the river, in canals and return flow channels, and in adjacent wetlands and other habitats. We present summary statistics for various water quality parameters, estimate nutrient loads, and evaluate water quality impacts from refuge management activities. We develop nutrient budgets for two different areas on the refuge. Water temperature has been examined in a separate report and will not be discussed in detail here. Water management and water use in the Blitzen Valley has also been discussed in previous reports. Water quality and nutrient budgets for West Knox Pond, a permanently-flooded wetland, are covered in a separate report as well.

METHODS

We collected instantaneous measurements of field water quality parameters at a number of sites within the Blitzen Valley in 2002 and 2003. Measurements were collected from the beginning of April through the end of September in both years. The monitoring sites were located along the Blitzen River and in tributaries, adjacent wetlands, and return flow channels. Figures 1 and 2 along with Tables 1 and 2 present the name, station number, and location of each site. The measurements were collected about every two weeks, with more frequent measurements during the summer. The parameters we measured included water temperature, conductivity, pH, dissolved oxygen, and turbidity. Water temperature and conductivity were measured with an Orion Conductivity Meter, model 115. pH was measured with a Orion pH meter, model 210, and a glass electrode. Turbidity was measured with a Hach turbidimeter. We calibrated all meters prior to use each day. Dissolved oxygen was measured colorimetrically with a Hach Digital Titrator and DO kit.

We also collected hourly continuous measurements of water temperature, conductivity, pH, and dissolved oxygen with Hydrolabs at several of the sites. In 2002, the Hydrolabs were deployed at Stations 1, 9, 10, and 12. In 2003, they were deployed at Stations 1 and 26. We calibrated the Hydrolabs before deployment and the calibration was checked after deployment. The Hydrolabs were deployed concurrently for 96 hour periods approximately every two weeks from May through September.

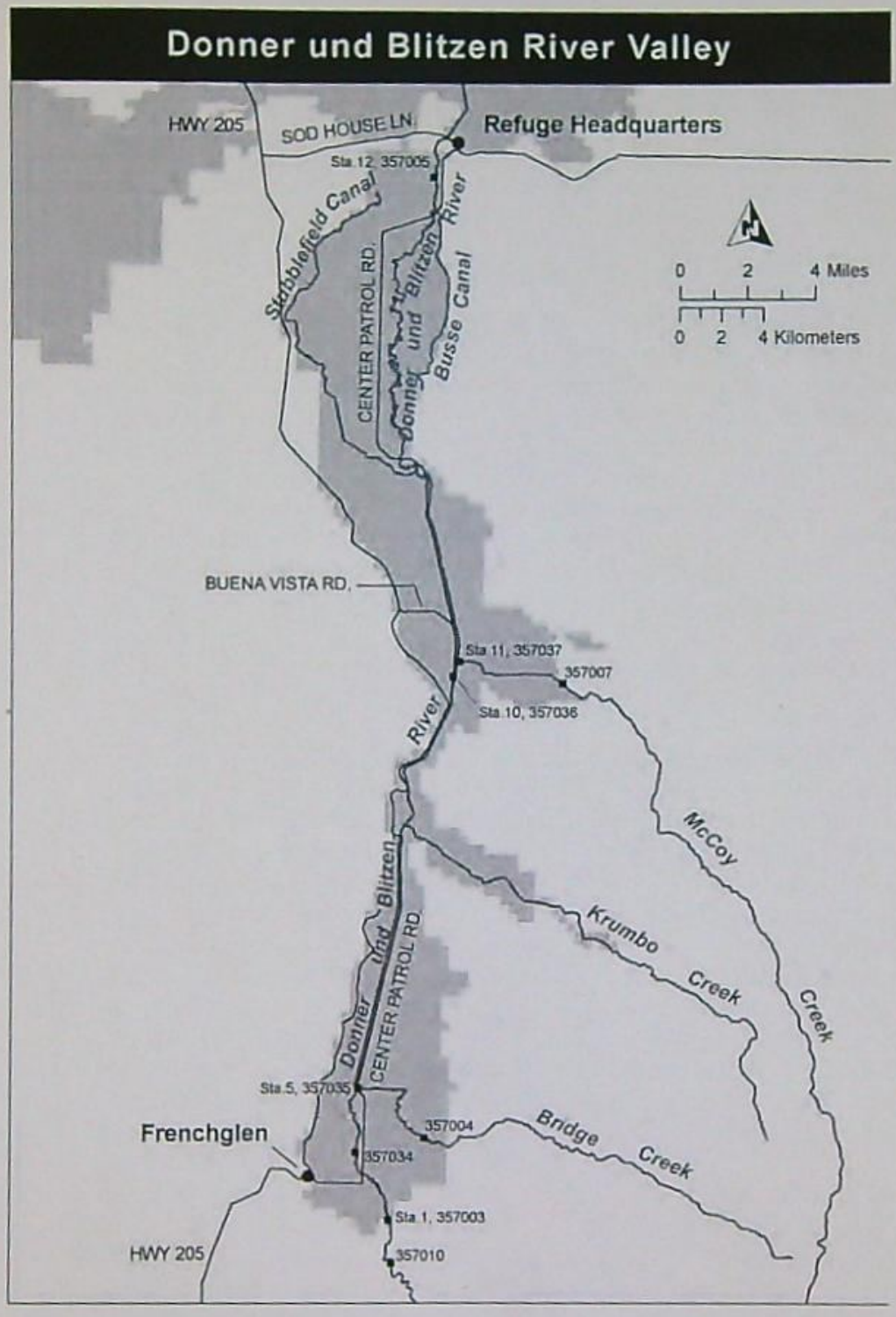

Figure 1. Map of Blitzen River Valley showing rivers and creeks, study monitoring sites, and several major landmarks and geographic features.

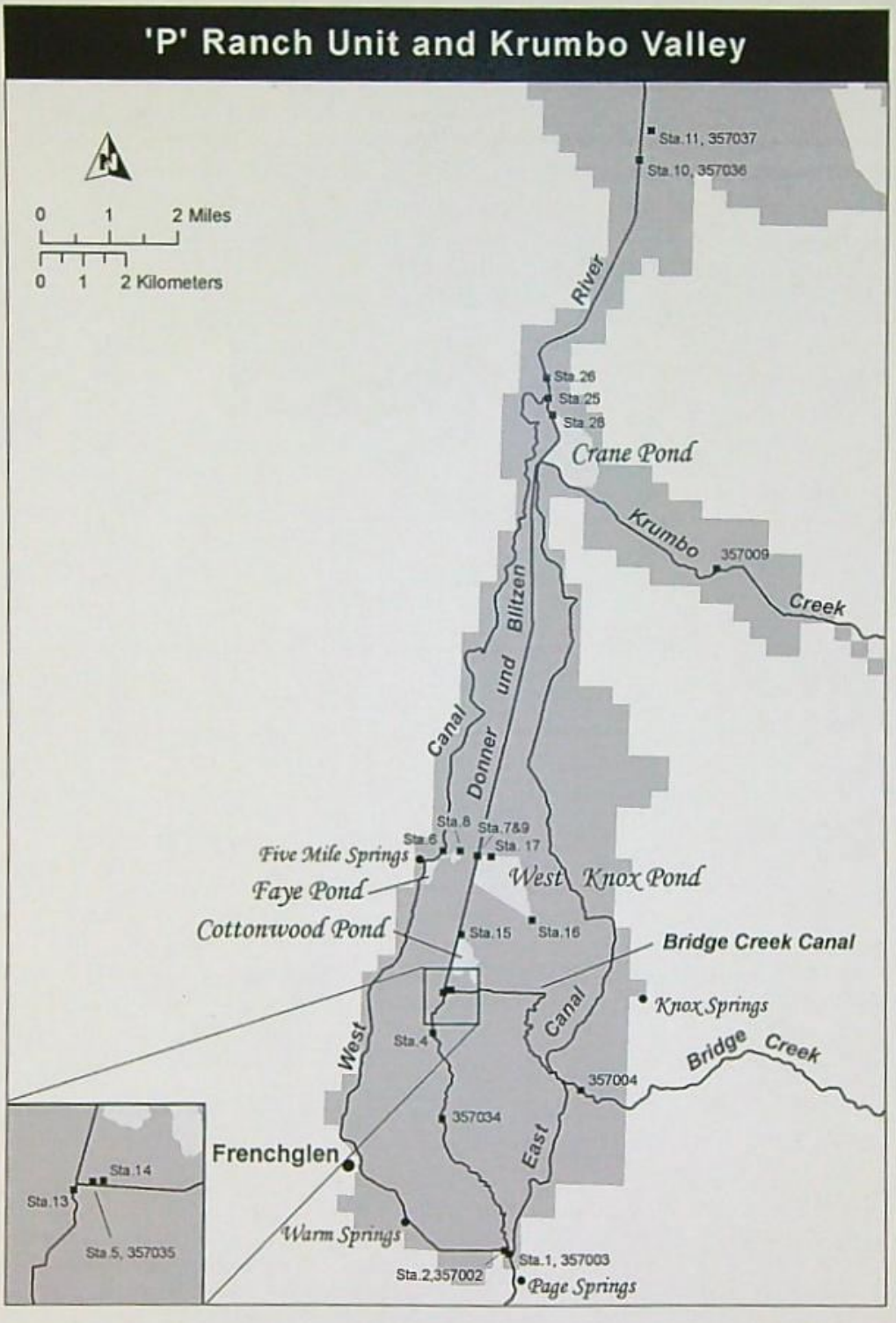

Figure 2. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

We collected grab samples from the sites for laboratory analyses of soluble reactive P (SRP), total P, ammonia-N, nitrate- and nitrite-N, total N, chlorophyll a, biological oxygen demand (BOD), and total suspended solids (TSS). For this study, the analytical sum of nitrate and nitrite is assumed to be nitrate and will be referred to as such. We analyzed chlorophyll a and BOD at almost all sites in 2002 but a reduced number of sites in 2003, based on the low concentrations we reported for many sites in the 2002 samples. Several samples were analyzed for E. coli and total coliform in the spring of 2002 but we discontinued these analyses, based on the low results for all samples. All laboratory analyses used standard analytical methods.

Table 1. River Water Quality Monitoring Sites

Station Number	Station Name	Distance downstream of Station 1 (mi)
1	Blitzen River blw Page Springs	0
13	Blitzen River at Bridge Creek	5.2
5	Bridge Creek at Blitzen	5.2
9	Blitzen River at 5-Mile Bridge	7.2
10/26	Blitzen River at Grain Camp	17.4 (Sta 10) / 14.5 (Sta 26)
11	McCoy Creek at Blitzen	17.9
12	Blitzen River blw Sodlhouse	44.0

Table 2. Irrigation Return Flow and Wetland Water Quality Monitoring Sites

Station Number	Station Name	General location of Station
7	Faye Pond return flow channel	West side of Blitzen River just upstream of 5-Mi Bridge
25	Rock Crusher Pond return flow channel	West side of Blitzen River, outlet channel for West Canal
17	West Knox Pond (permanent wetland)	East side of Blitzen River, south of Knox Drain Rd
15	Cottonwood Pond (seasonal wetland)	East Side of Blitzen River, north of Bridge Creek
28	Crane Pond (permanent wetland)	Adjacent to Blitzen River at downstream end of Krumbo Valley

We describe summary statistics and use box plots to show the distributions of the various water quality parameters as a function of distance downstream on the refuge. In a box plot, the box defines the interquartile range (25^{th} to 75^{th} percentile), the line inside the box defines the median, and the whiskers extending above and below the box define the 90^{th} and 10^{th} percentiles, respectively. Any data values outside of this percentile range are plotted as separated points. Censored data (nondetectable concentrations) were analyzed and plotted using the censored data techniques of Helsel (2005). We used a Kruskal-Wallis test to test for statistically significant differences among a group of sites for a given year and period (runoff or baseflow). We used a t-test (or a Mann-Whitney test) to test for significant differences in means (or medians) between periods (runoff and baseflow) at an individual site.

We developed mass balances and nutrient budgets for both total N and total P for different areas and habitats using the concentration data and the water budget information that was developed in an earlier report. For the nutrient budgets, we divided the irrigation season into two periods, runoff and baseflow, and calculated separate mass balances for each period. The transition from runoff to baseflow was arbitrarily considered by us to occur on Jul 1, which is consistent with the other reports in this study. We averaged total N and total P concentrations for each period and then multiplied that average by the total volume of water for each period to determine the mass of nutrient moving past a given site.

RESULTS

Flows

Figure 3 shows the Apr-Sept Blitzen River flows at several flow monitoring sites for the two years of water quality monitoring. The four sites, from upstream to downstream are 1) the USGS Blitzen gage upstream of the refuge, 2) the Blitzen below Page Springs, 3) the Blitzen below Grain Camp, and 4) the Blitzen below Sodhouse (see Figure 1). The April to September runoff measured at the USGS Blitzen River gage was below normal in 2002 and 2003. Total April-September runoff was 49,565 af in 2002 (31^{st} percentile of all years) and 55,509 af in 2003 (41^{st} percentile of all years). Peak flows were much higher in 2003 than 2002 but baseflows were lower. Average baseflow for July 1 to September 30 was 43 cfs in 2002 and 40 cfs in 2003. In both years, the runoff period on the Blitzen extends from April through May or June and the baseflow period begins sometime in July. We arbitrarily separated the runoff and baseflow periods on Jul 1 in both years. Peaks in flow at the downstream sites are attenuated and delayed relative to the upstream sites and flow generally decreases in the downstream direction due to diversions and losses on the refuge. About the 3^{rd} week of July, the FWS stops most diversions on the refuge and flows at the downstream sites increase and become approximately equal to the upstream sites, as seen in Figure 3.

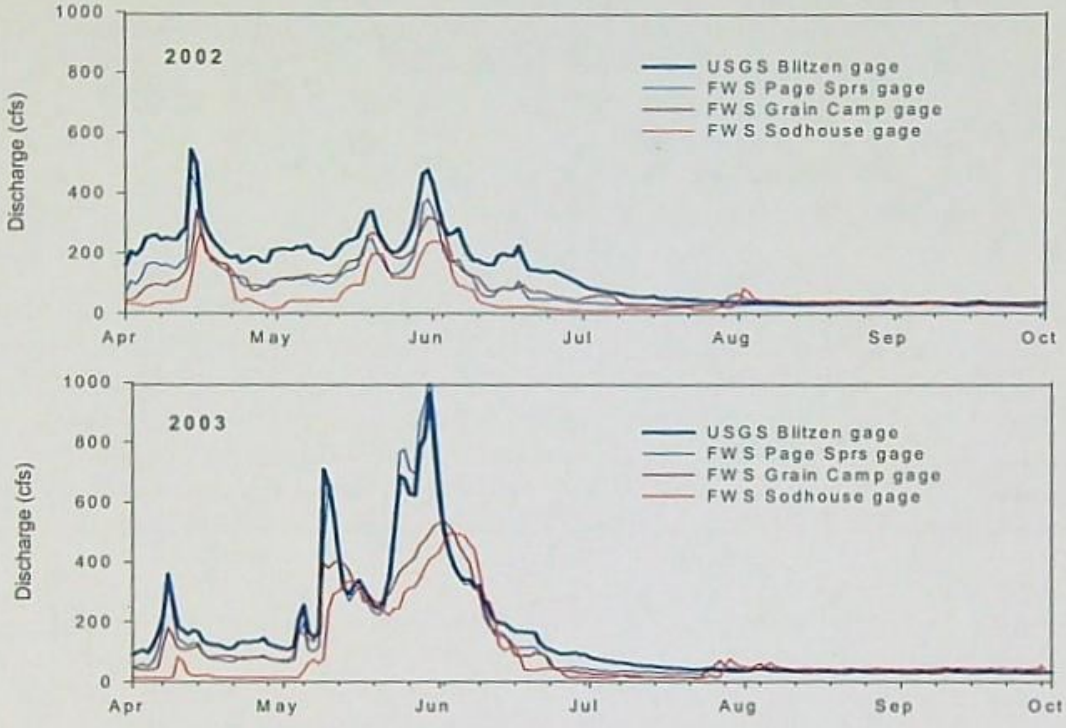

Figure 3. Blitzen River daily flows at USGS gage, Blitzen below Page Springs, Blitzen below Grain Camp, and Blitzen below Sodhouse Dam for Apr-Sept, for 2002 (top) and 2003 (bottom).

Electrical conductivity

Electrical conductivity is a measure of the dissolved ions in the water and a surrogate measure of water quality. High conductivity is not necessarily harmful to fish and other aquatic organisms in and of itself, but it can be associated with other harmful constituents. There is no state water quality standard for conductivity.

Conductivity in the Blitzen River ranges from about 50 µS/cm at the upstream end of the refuge to about 275 µS/cm at Sodhouse (Figure 4 and Table 3). Roy et al. (2001) reported a similar range and a similar increase with distance downstream in their monitoring results from Jul-Sept, 1999. A Kruskal-Wallis test indicated that, for both periods and both years, the median from at least one site was significantly different from the group at the 0.05 level. The highest river conductivities occur downstream at Station 10/26, Blitzen River near Grain Camp, and Station 12, Blitzen River below Sodhouse. Conductivity also increases seasonally, from the runoff period to the baseflow period. For most of the upstream sites (Stations 1, 13, and 9), this increase was statistically significant. There was no significant increase between the two periods at the downstream sites (Stations 10/26 and 12), except at Station 12 in 2002. Conductivities are more uniform all season at downstream sites when grouped by period. However, there were changes in conductivity throughout the summer that point to the contribution of irrigation return flows as a source of higher conductivity.

Table 3. Median values of conductivity (µS/cm) for runoff and baseflow periods in 2002 and 2003 at Blitzen River sites from upstream to downstream. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	**57.7**	**94.6**	**72.4**	**89.8**
13	Blitzen River abv Bridge Creek	na	102.5	**77.5**	**97.2**
9	Blitzen River at 5-Mile Bridge	**87.0**	**102.2**	**82.3**	**109.2**
10/26	Blitzen River nr Grain Camp	124.0	131.8	112.1	133.6
12	Blitzen River blw Sodlhouse	**122.4**	**159.6**	119.4	130.8

Time series plots of conductivity for several river and return flow sites in 2002 and 2003 are presented in Figure 4. For all sites, except the Blitzen below Page Springs, conductivity peaks in July, just prior to the cessation of irrigation and declines in August. Roy et al. (2001) reported a similar trend in conductivity in their monitoring results from Jul-Sept, 1999. This could be indicative of the contribution from irrigation return flows to the river, especially given that the trend is less evident at upstream sites where there is less return flow. Our monitoring of return flows indicates that they are typically higher in conductivity than the river (150 to 300 µS/cm). They represent a greater proportion of the total flow in the river once runoff recedes in July and therefore, they would affect river water quality most at this time. Return flows are greatly reduced or eliminated altogether after irrigation is stopped about the 3rd week in July, so they would affect river water quality much less after this time. This is probably why conductivity declines in the river sites after the end of the irrigation season.

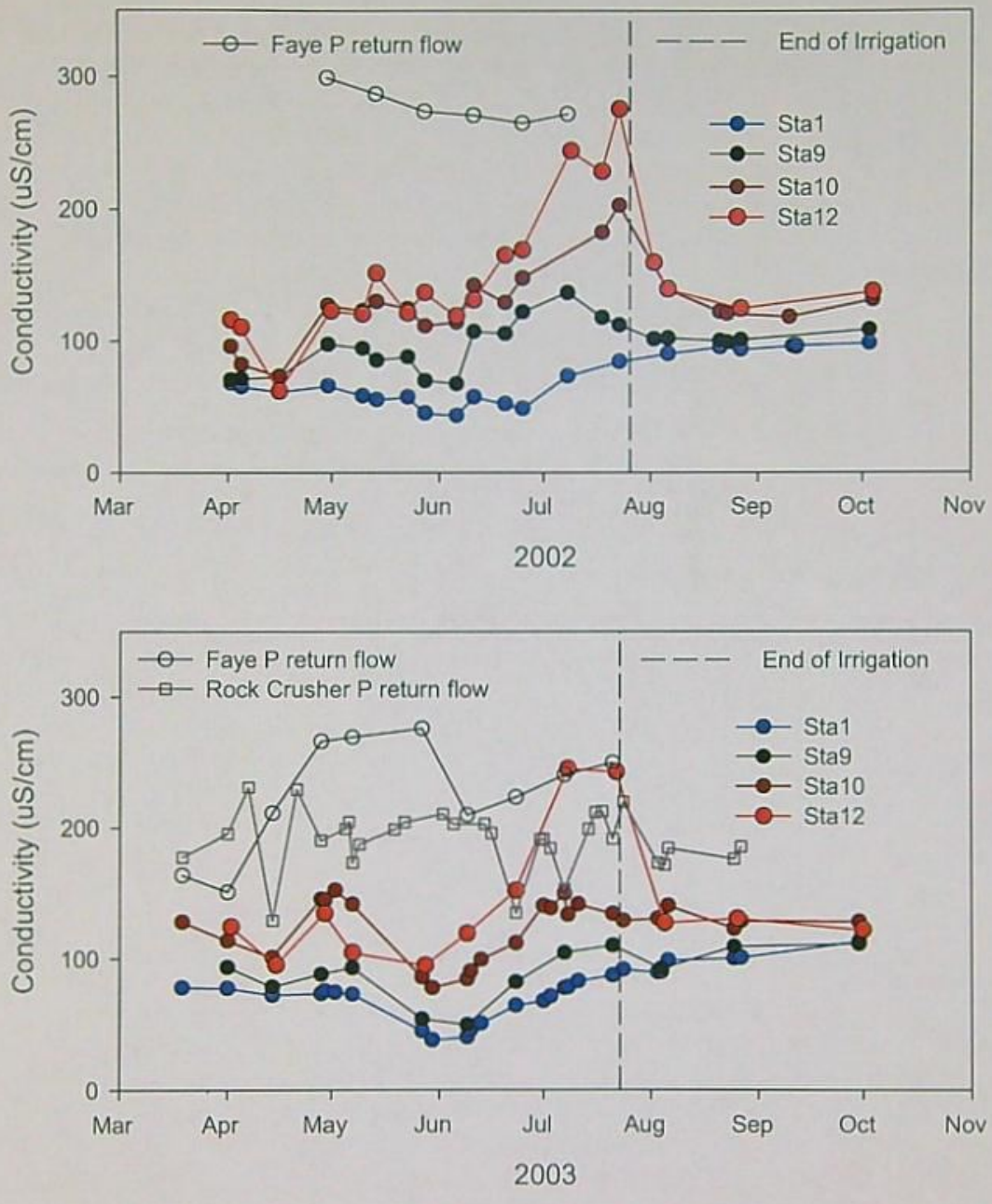

Figure 4. Electrical conductivity at Blitzen River and return flow water quality monitoring stations in 2002 (top) and 2003 (bottom).

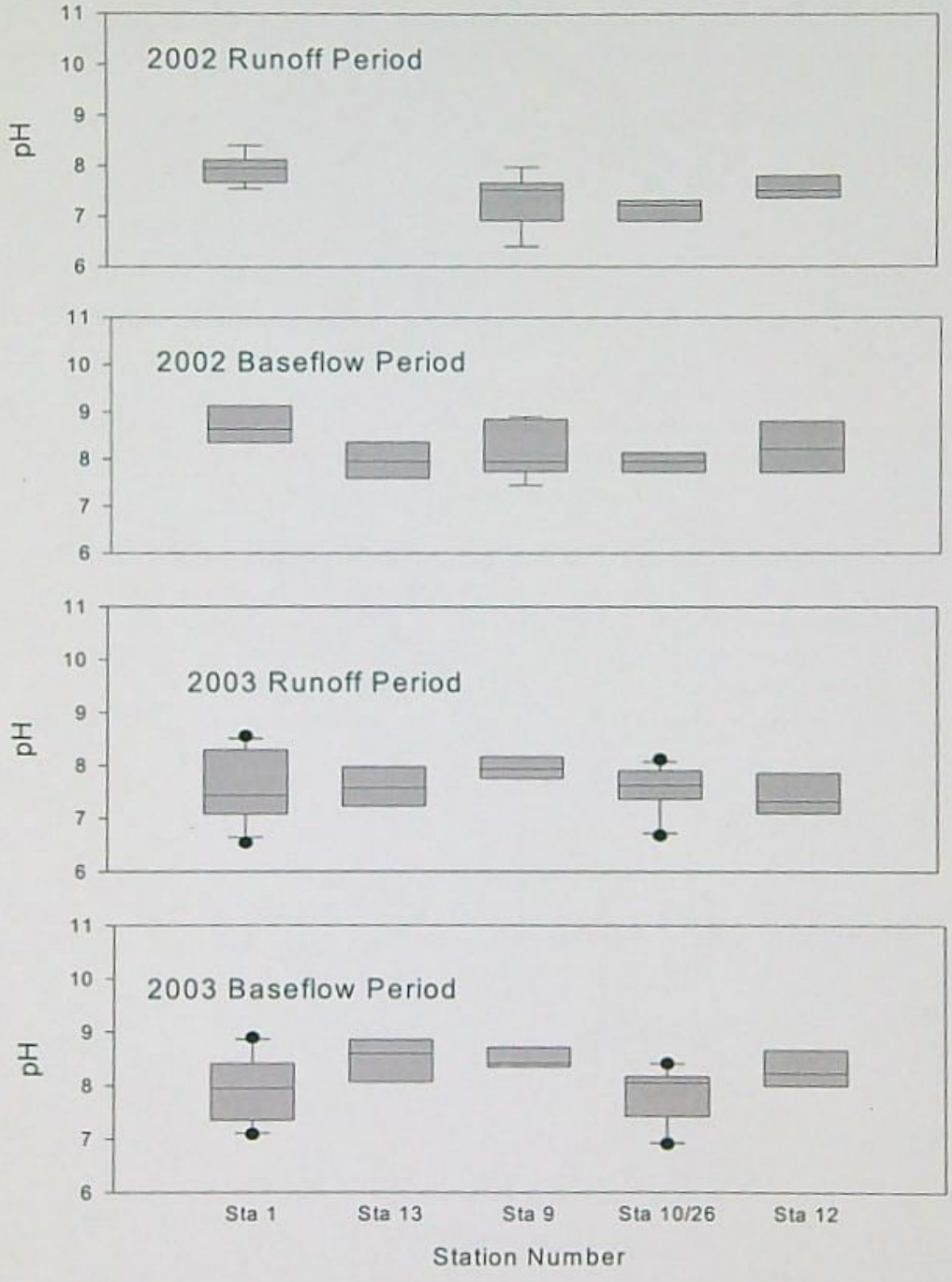

Figure 5. pH at Blitzen River water quality monitoring stations during the runoff and baseflow periods in 2002 (top) and 2003 (bottom).

pH

pH is a measure of the negative log of the hydrogen ion activity, or concentration, in water. The higher the pH, the lower the concentration. The state water quality standard for pH in the Malheur Lake Basin is 7.0 to 9.0.

pH in the Blitzen River generally ranges from 7.0 to 8.5 (Figure 5). At times, pH in the Blitzen River has exceeded the state standard of 9.0, but only at Station 1 at the upstream boundary of the refuge. pH varies diurnally and seasonally. The consumption of CO_2 during the day through photosynthesis can increase pH. pH decreases at night due to increase of CO_2 from re-equilibration with atmospheric CO_2 and decomposition of organic matter. Seasonally, pH is higher during the baseflow period. Warmer temperatures and lower flows increase primary productivity and respiration. And lower flows mean the water column is slower to equilibrate with atmospheric CO_2.

pH tended to decrease downstream in 2002 but not in 2003. A Kruskal-Wallis test indicated that the median from at least one site was significantly different from the group at the 0.05 level for both periods in 2002 but neither period in 2003. The pH at all sites was more uniform in 2003 during runoff and baseflow. Roy et al. (2001) reported a decrease in pH with distance downstream in their monitoring results from Jul-Sept, 1999. A Mann-Whitney test was used to test for significant differences between runoff and baseflow periods at individual sites. The sites with statistically significant differences between the two periods are shown in bold in Table 4. For most sites, the difference between the two periods is significant, with pH higher during the baseflow period. pH in irrigation return flow channels was very similar to river pH and ranged between 7.0 and 8.0. Wetlands that remained flooded through the summer had higher pH, ranging from 8.0 to 9.0 or even greater at times. Overall, return flows do not seem to be affecting river water quality in terms of pH.

Table 4. Median values of pH for runoff and baseflow periods in 2002 and 2003 at Blitzen River sites from upstream to downstream. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	**8.0**	**8.6**	7.4	7.9
13	Blitzen River abv Bridge Creek	na	8.0	**7.6**	**8.6**
9	Blitzen River at 5-Mile Bridge	**7.5**	**7.9**	**7.9**	**8.4**
10/26	Blitzen River nr Grain Camp	**7.2**	**7.9**	7.6	8.1
12	Blitzen River blw Sodlhouse	**7.5**	**8.2**	**7.3**	**8.2**

Dissolved oxygen

Dissolved oxygen (DO) is one of the most important water quality parameters for the health of fish and other aquatic organisms (Wetzel, 2001). DO varies diurnally in response to photosynthesis and decomposition. Oxygen is produced during the day through photosynthesis and consumed at night through decomposition. DO will also vary seasonally in response to changes in the vegetation and organic matter concentrations. The solubility of DO is also inversely related to water temperature. As water temperatures warm seasonally, the solubility of DO decreases and concentrations will decrease.

The state water quality standard for DO in the Blitzen River has not been formally defined (Dick Nichols, DEQ Manager in Bend, OR, personnel communication). The statewide water quality criteria for dissolved oxygen in waters identified as providing cold-water aquatic life is a concentration not less than 8.0 mg/L or 90% saturation. Cold-water aquatic life means "aquatic organisms that are physiologically restricted to cold water, including but not limited to native salmon, steelhead, mountain whitefish, char (including bull trout), and trout." Water bodies in the Malheur Lake Basin may be designated as providing "cold-water aquatic life" but they have not been formally designated yet.

DO concentrations at several sites in the Blitzen River and tributaries dropped below this criteria during the runoff and baseflow periods of both years. Two trends are evident in the data. First, there is a decrease in DO concentrations downstream from Page Springs to Sodhouse (Figure 6). The lowest dissolved oxygen concentrations occur downstream at Station 10/26, Blitzen River near Grain Camp, and Station 12, Blitzen River below Sodhouse. Roy et al. (2001) reported a similar trend in their monitoring results from Jul-Sept 1999. The decrease in concentrations with distance downstream occurs during runoff and baseflow periods. A Kruskal-Wallis test indicated that, for both periods and both years, the median from at least one site was significantly different from the group at the 0.05 level. A Mann-Whitney test was used to test for significant differences between runoff and baseflow periods at individual sites. The sites with statistically significant differences between the two periods are shown in bold in Table 5.

The second trend is a decline in DO concentrations and % saturation from runoff to baseflow period in both years at some sites (Table 5). Time series plots of % saturation in 2002 and 2003 for several river and return flow sites are presented in Figure 7. The measure, % saturation, takes into account any decline in DO concentration related to increasing water temperatures. All river sites begin at about the same DO % saturation in spring and decline throughout the season. Downstream sites decline more than upstream sites. In 2002, DO % saturation recovers in late summer at most sites but in 2003, this does not occur.

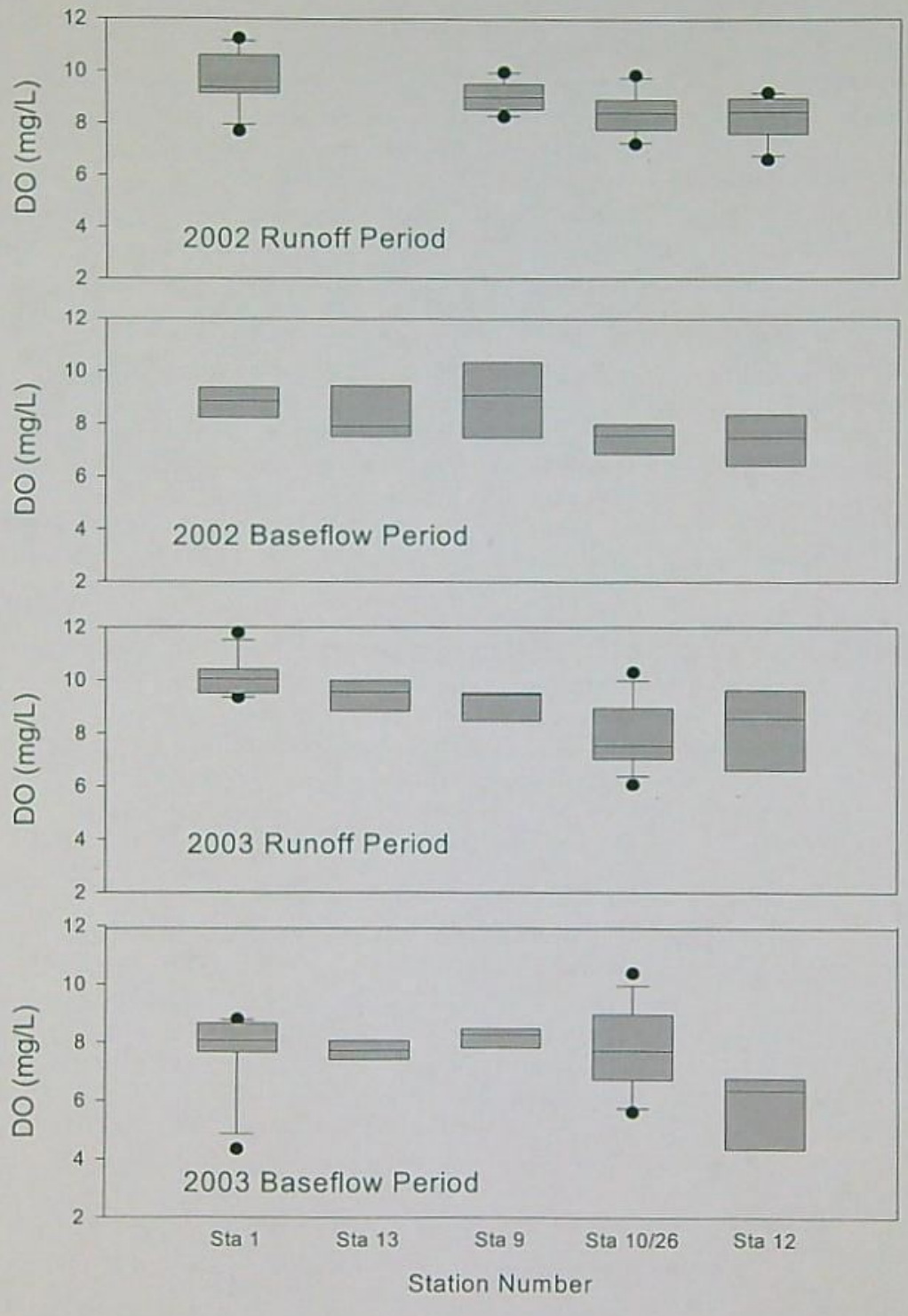

Figure 6. Dissolved oxygen concentrations at Blitzen River water quality monitoring stations during the runoff and baseflow periods in 2002 (top) and 2003 (bottom).

Table 5. Median values of dissolved oxygen concentrations (mg/L) and % saturations for runoff and baseflow periods in 2002 and 2003 at Blitzen River (upstream to downstream) and tributary sites. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods. Years without data mean no monitoring occurred.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	9.4 (94%)	8.9 (88%)	**10.1** (102%)	**8.1** (79%)
13	Blitzen River abv Bridge Creek	Na	7.9 (77%)	**9.6** (92%)	**7.7** (73%)
9	Blitzen River at 5-Mile Bridge	9.1 (90%)	9.1 (91%)	9.5 (95%)	8.3 (81%)
10/26	Blitzen River nr Grain Camp	**8.4** (83%)	**7.6** (74%)	7.5 (73%)	7.7 (75%)
12	Blitzen River blw Sodlhouse	8.4 (83%)	7.5 (72%)	8.6 (77%)	6.4 (60%)
5	Bridge Crk at Blitzen	**8.8** (87%)	**6.5** (61%)	**8.9** (87%)	**7.4** (71%)
11	McCoy Crk at Blitzen	9.2 (92%)	8.5 (84%)		

Table 6. Median values of dissolved oxygen (mg/) at irrigation return flow and wetland sites in 2002 and 2003. Years without data mean no monitoring occurred.

Station Number	Station Name	2002	2003
7	Faye Pond return flow channel	4.9 (n=6)	6.4 (n=10)
25	Rock Crusher return flow channel		4.7 (n=33)
17	West Knox Pond	6.6 (n=22)	6.4 (n=25)
15	Cottonwood Pond	6.9 (n=2)	7.1 (n=7)
28	Crane Pond		8.2 (n=11)

Return flow sites are consistently lower in DO than river sites (Table 6). It is likely that return flows and tributaries are contributing to low DO in the river. Unlike conductivity, river DO remains low after irrigation is stopped the 3rd week of July, especially in 2003. As will be discussed under BOD, irrigation and wetland return flows are contributing biodegradable organic material to the river, in addition to low DO waters. This material may be subsequently decomposing, causing DO levels to remain low even after return flows have ceased.

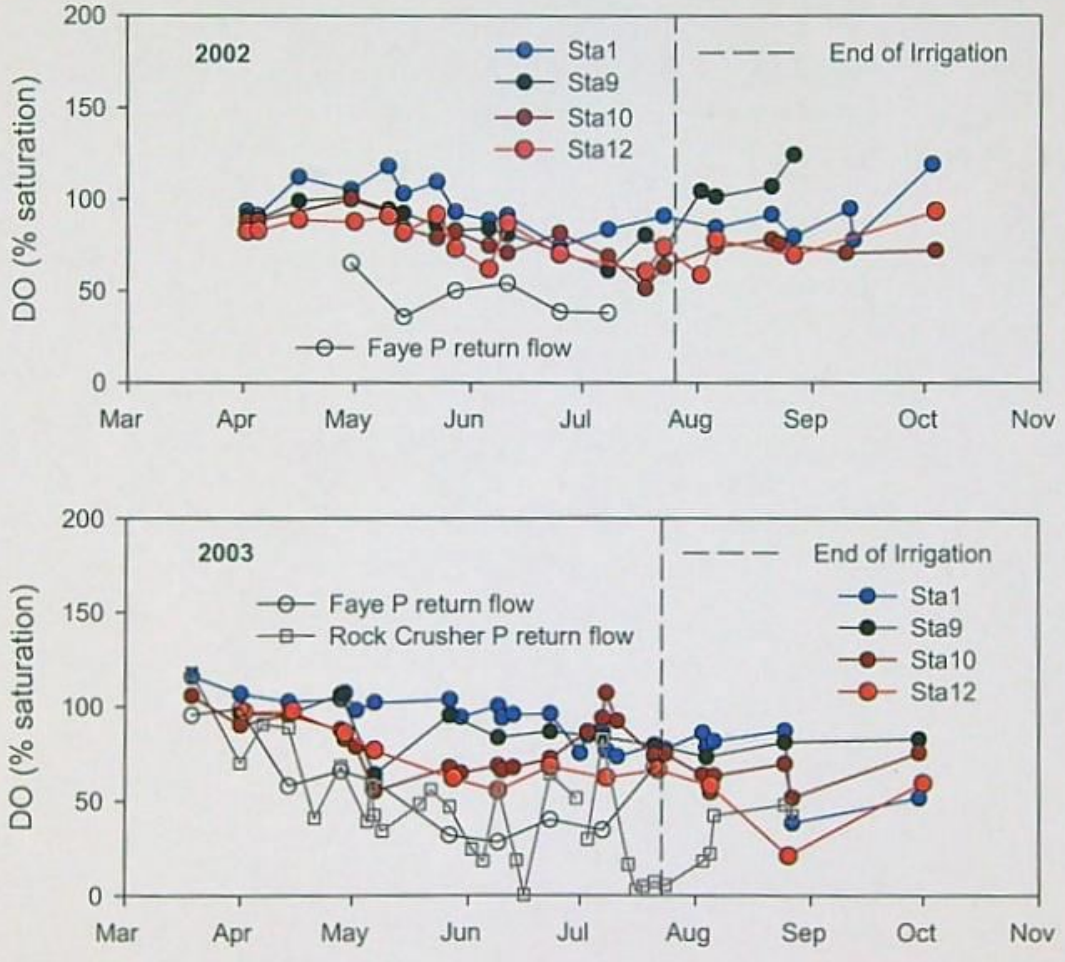

Figure 7. Dissolved oxygen percent saturation at Blitzen River and return flow water quality monitoring stations in 2002 (top) and 2003 (bottom).

Hydrolab monitoring results for pH and DO

Both pH and DO are affected by biological processes (photosynthesis and decomposition) and both parameters, particularly DO concentrations, are partly a function of water temperatures as well. This results in variations diurnally as well as seasonally. We characterized this diurnal and seasonal fluctuation with the 3-day continuous deployments of Hydrolabs at various times during the season. Figures 8 and 9 present box plots of the hourly data collected from early, mid, and late season deployments at two sites along the Blitzen. The sites are Station 1, Blitzen below Page Springs, where the river enters the refuge, and Station 10/26, Blitzen near Grain Camp, about one-third of the way downstream through the Blitzen Valley (Figure 1). Generally, there is much less diurnal fluctuation at the downstream site, especially with pH. Interquartile ranges of pH (represented by the size of the box in the boxplots) are smaller at the downstream sites, as can be seen in Figures 8 and 9. This may indicate less biological activity in this part of the river, at least in terms of primary productivity. There is less fluctuation in pH under high flows, as can be observed in the late May measurements from both sites in both years.

DO concentrations are lower at the downstream site than the upstream site but the seasonal trends are similar at both sites. Under high flows in late May, DO concentrations are high and do not fluctuate much diurnally. Seasonal minimums of DO occur in July at both sites, especially in 2002, and this was evident in the instantaneous values collected at all river sites. One reason for this may be that water temperatures reach their seasonal maximums in July. The solubility of DO is a function of water temperature and increasing temperatures result in lower DO concentrations. Moreover, warmer water temperatures increase the rate of organic decomposition, which consumes DO. Another factor could be the contribution of low DO irrigation return flows through the end of July. DO concentrations recover somewhat in late summer as water temperatures decrease and return flows diminish. DO concentrations rebound in August and September at both sites.

Biological oxygen demand (BOD)

BOD is an empirical test of the oxygen requirements for biodegradation of organic material in a water sample. It can be used to indicate the relative concentration of biodegradable organic material in waters and the general water quality of a water body. Higher BOD will correspond with lower DO. Pristine waters have a BOD of < 1.0 mg/L and moderately polluted water have BOD ranging from 2.0 to 8.0 mg/L. There is no state standard for BOD in the Malheur Lake Basin.

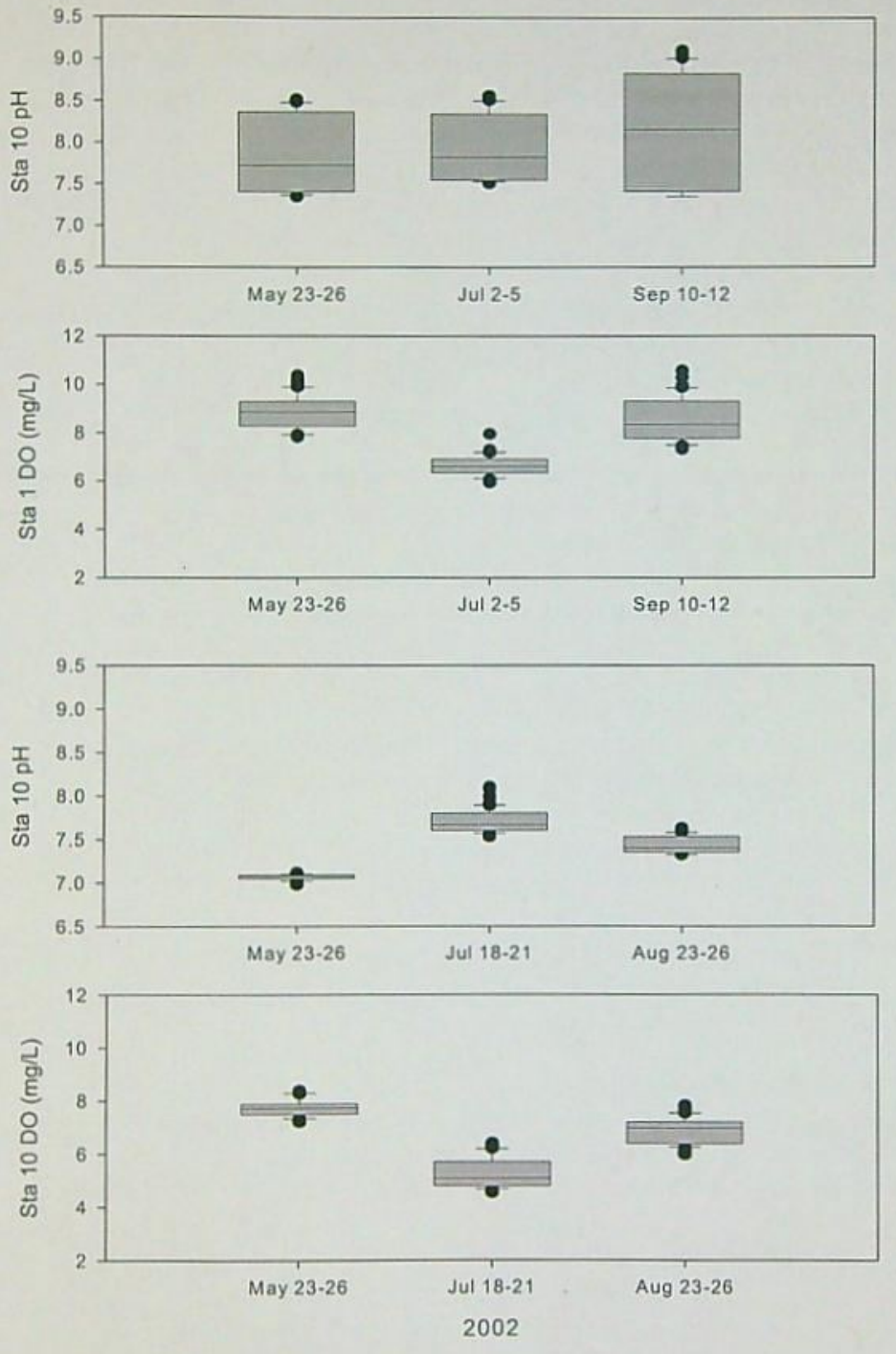

Figure 8. Distribution of hourly pH and dissolved oxygen concentrations at two Blitzen River water quality monitoring stations (Stations 1 and 10) for three deployments in 2002.

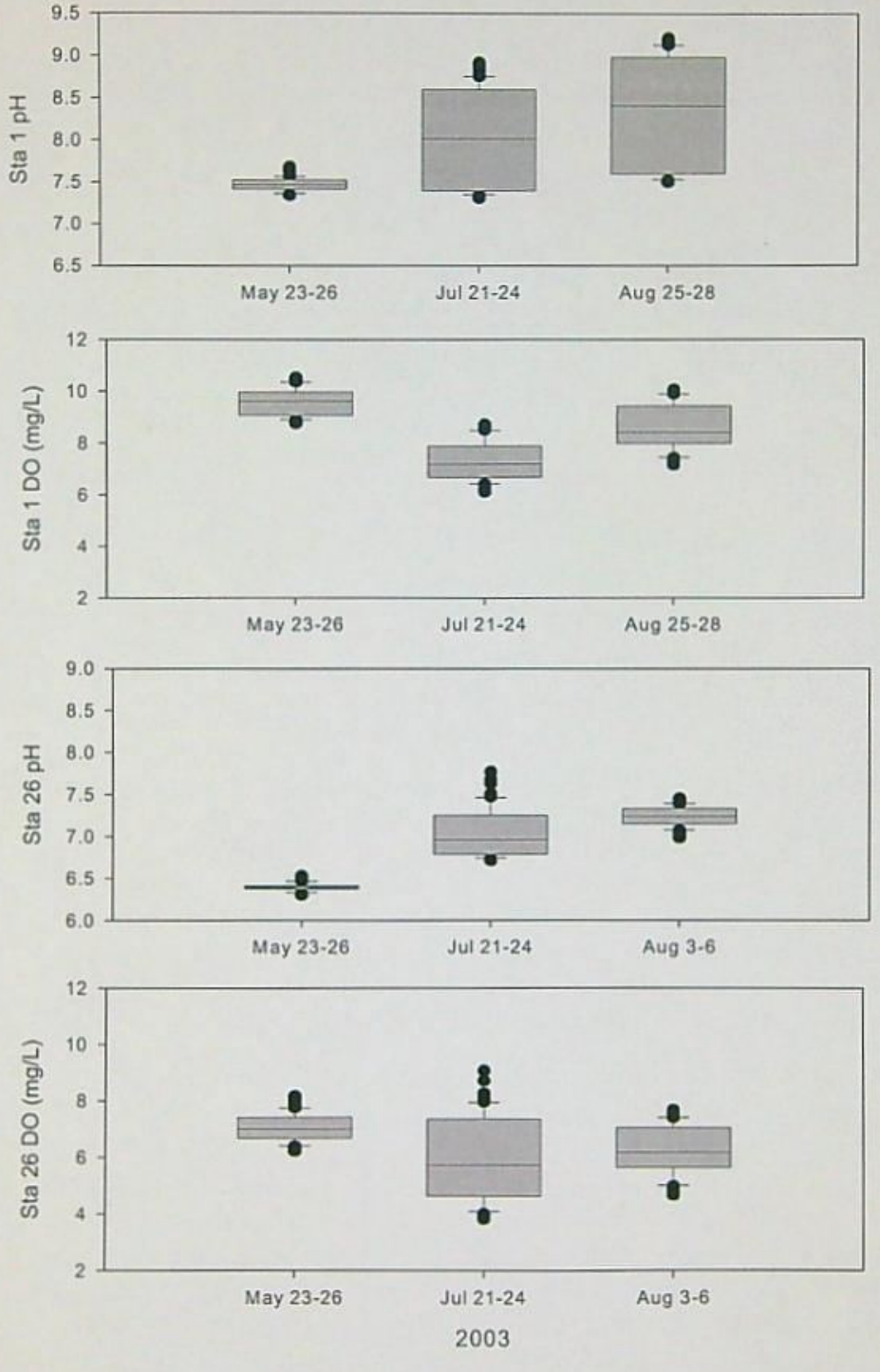

Figure 9. Distribution of hourly pH and dissolved oxygen concentrations at two Blitzen River water quality monitoring stations (Stations 1 and 10) for three deployments in 2003.

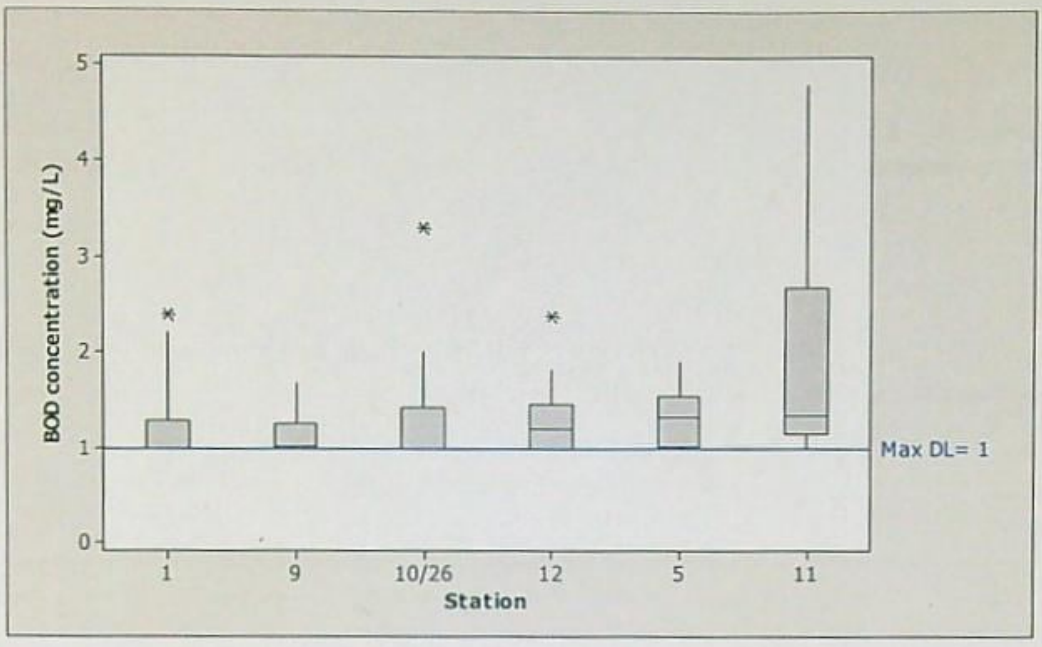

Figure 10. Censored boxplots of BOD for Blitzen River water quality monitoring stations for both 2002 and 2003.

BOD data for both seasons and both years are grouped by site and presented in Figure 10. Between 40 and 60% of the river samples and 60 to 80% of the tributary samples were non-detects (< 1.0 mg/L). Station 12, Blitzen below Sodhouse, and the two tributary samples have higher concentrations than the other river sites. A smaller percentage of the return flow and wetland sites, between 0 and 30%, were below the detection limit. In general, these sites had higher BOD concentrations than the river and tributary sites. It is likely that irrigation and wetland return flows are contributing biodegradable organic material to the river, resulting in lower DO concentrations in the river.

Turbidity and total suspended solids (TSS)

Turbidity and TSS are two independent instantaneous measures of the amount of suspended solid material in the water. The suspended solids can be organic (possibly organic matter or algae) or inorganic (clay and silt particles that carried in suspension); the two measures do not distinguish between forms of suspended matter. The state water quality standard for turbidity is that there can be no more that a 10% cumulative increase in natural stream turbidities, measured relative to a control point immediately upstream of the turbidity-causing activity. The standard is directed more at point sources and it's not clear how it would apply to refuge activities.

The two field water quality parameters follow similar trends at all sites, which is not surprising since the two parameters are different measures of suspended solids in the water column. In the upstream Blitzen River sites (Stations 1, 13, and 9), turbidity and TSS were closely correlated with flows, increasing with high flows and decreasing with low flows (Figure 11). Values at Station 5 (Bridge Creek at Blitzen) showed a similar seasonal trend. Turbidity at all these sites is much lower during the baseflow period compared to the runoff period. At the downstream Blitzen River sites, turbidity increased during runoff, decreased in mid-summer briefly, and then increased again in late summer and early fall. This occurred most obviously at Station 12 (Blitzen below Sodhouse) in 2002 and 2003 and Station 10 (Blitzen near Grain Camp) in 2002. A Kruskal-Wallis test indicated that, for the baseflow period in both years, the median from Station 10 in 2002 and Station 12 in 2002 and 2003 was significantly different from the other sites at the 0.05 level. A Mann-Whitney test was used to test for significant differences between runoff and baseflow periods at individual sites. The sites with statistically significant differences between the two periods are shown in bold in Table 7. All of the upstream sites show significant differences between runoff and baseflow periods but Station 10 in 2002 and Station 12 in 2002 and 2003 do not, because of the late season increase at these two sites.

Irrigation return flows could partly be responsible for the late season increase at the downstream sites. Wetlands likely settle solids, especially inorganic material, reducing turbidity and TSS, but there is much more photosynthetic activity and biotic production of suspended material in some of these wetlands (like West Knox Pond). The volume of return flows reaching the river in August and September is small but they could be contributing to suspended solid loads in the river.

Table 7. Median values of turbidity (NTU) for runoff and baseflow periods in 2002 and 2003 at Blitzen River sites from upstream to downstream. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	**13.6**	**4.0**	**10.2**	**2.3**
13	Blitzen River abv Bridge Creek	na	3.1	**12.5**	**2.3**
9	Blitzen River at 5-Mile Bridge	**17.3**	**3.8**	**21.0**	**4.4**
10/26	Blitzen River nr Grain Camp	6.4	11.0	**20.0**	**5.3**
12	Blitzen River blw Sodlhouse	12.2	12.6	31.1	17.9

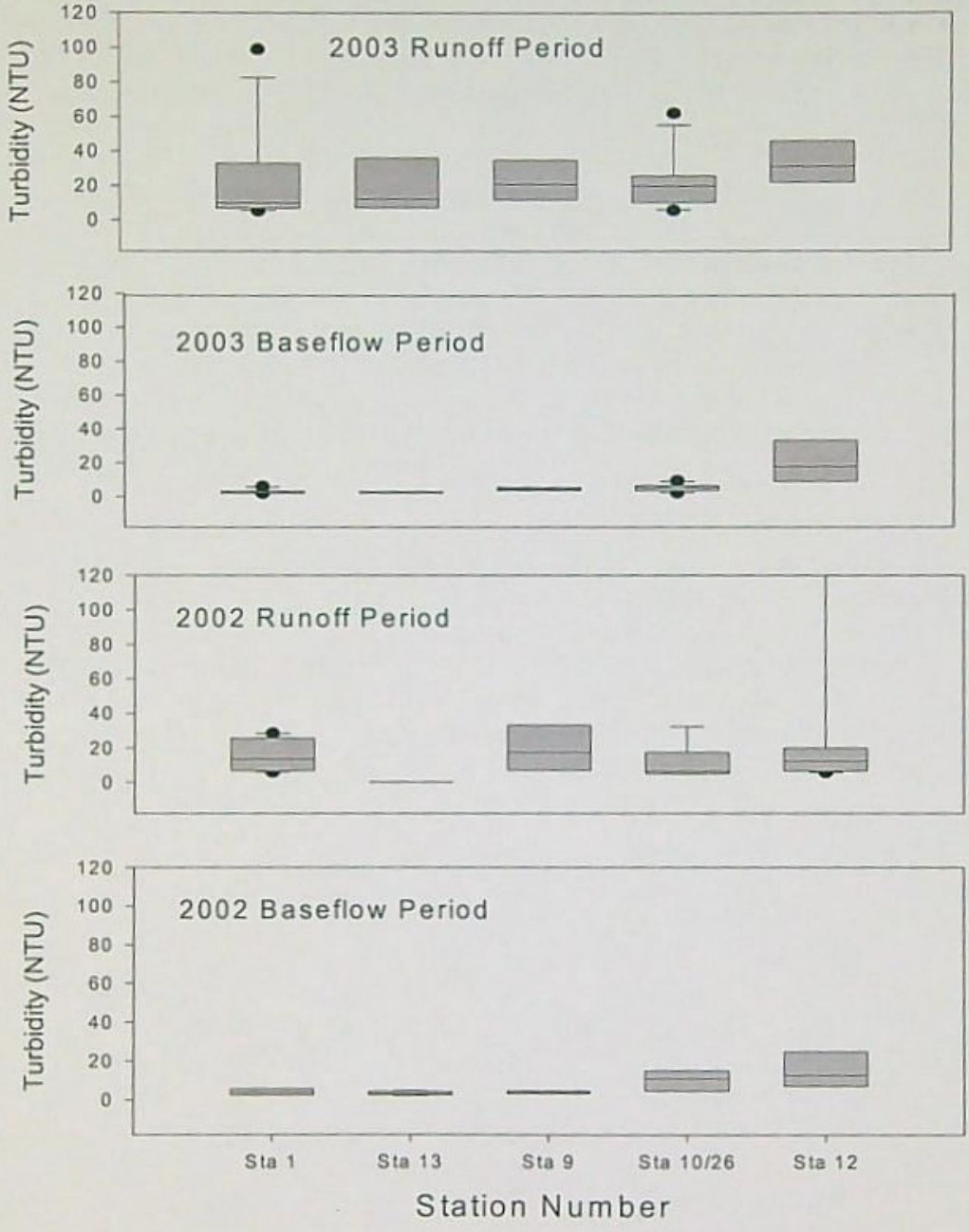

Figure 11. Turbidity at Blitzen River water quality monitoring stations during the runoff and baseflow periods in 2002 (top) and 2003 (bottom).

More likely, downstream increases in turbidity later in the season are related to dam operations. The dams back up water for diversion during the irrigation season, and likely trap sediment in the process. When diversions are ceased about the 3rd week of July, the dam gates are opened and this trapped sediment may be mobilized. The timing of the late season increases seems to implicate dam operations since turbidity increases coincide with the opening of the dams in late July and early August. Carp activity may also contribute to sediment mobilization.

Phosphorus

Phosphorus is most often the nutrient limiting primary productivity in freshwater ecosystems (Wetzel, 2001). There is no state water quality standard for P in Malheur Lake Basin. Total P concentrations in nonpolluted natural waters extend over a very wide range but are generally between 0.01 and 0.05 mg/L (Wetzel, 2001).

There are two basic forms of forms of phosphorus that were distinguished analytically in this study: total P and SRP. Total P is a measure of all P in the sample and includes solid organic and inorganic forms and dissolved forms. SRP is a measure of dissolved P, which is primarily orthophosphate. It is primarily SRP that is immediately bioavailable to organisms.

Total P concentrations in the river increase downstream through the refuge from Page Springs to Sodhouse Dam (Figure 12 and Table 8). Median total P concentrations from Page Springs to Sodhouse increase two to threefold or more. The most obvious increases occur downstream at Station 10/26 and Station 12. A Kruskal-Wallis test indicated that, for both periods in both years, the median from at least one site was significantly different from the group at the 0.05 level. Differences between runoff and baseflow periods were not as strong. Generally, total P concentrations were higher during the runoff period but this was not always the case and the differences were not always statistically significant (Table 8).

High concentrations of total P are episodic and may be related to suspended sediment and higher flows. The largest range of total P concentrations occurred during the 2003 runoff period. This may be related to the large range of flows during this period. Total P is associated with suspended sediment, especially at the upstream sites, and both of these parameters increase with higher flows. Downstream concentrations were not as closely related to suspended sediment and may reflect a combination of sources of P, including irrigation and wetland return flows and internal loading from resuspended sediments coinciding with dam operations. Concentrations of total P in return flows and adjacent wetlands were typically much higher than the river concentrations (Table 9). This source could be partly responsible for increasing total P concentrations downstream.

The percentage of P as SRP ranges from about 30 to 50% in the river samples, with no apparent trends downstream or seasonally. The percentage of SRP in wetland and return flow samples ranges higher, from 30 to 75%. It's likely that organic P is getting converted to SRP in wetlands and flooded fields. Mayer (2005) described a similar trend in wetlands at Klamath Basin NWR. This means that return flows from wetlands and wet meadows in the Blitzen Valley could be a source of bioavailable P at times.

Table 8. Median values of total phosphorus (mg/L) for runoff and baseflow periods in 2002 and 2003 at Blitzen River sites from upstream to downstream. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	0.04	0.03	0.05	0.01
13	Blitzen River abv Bridge Creek	na	0.03	**0.03**	**0.02**
9	Blitzen River at 5-Mile Bridge	**0.07**	**0.04**	**0.09**	**0.04**
10/26	Blitzen River nr Grain Camp	0.10	0.09	**0.13**	**0.05**
12	Blitzen River blw Sodlhouse	0.08	0.11	0.13	0.12

Table 9. Median values of total phosphorus (mg/L) at irrigation return flow and wetland sites in 2002 and 2003. Years without data mean no monitoring occurred.

Station Number	Station Name	2002	2003
7	Faye Pond return flow channel	0.29 (n=9)	0.25 (n=10)
25	Rock Crusher return flow channel		0.13 (n=20)
17	West Knox Pond	0.53 (n=14)	0.51 (n=12)
15	Cottonwood Pond	0.13 (n=4)	0.16 (n=8)
28	Crane Pond		0.45 (n=11)

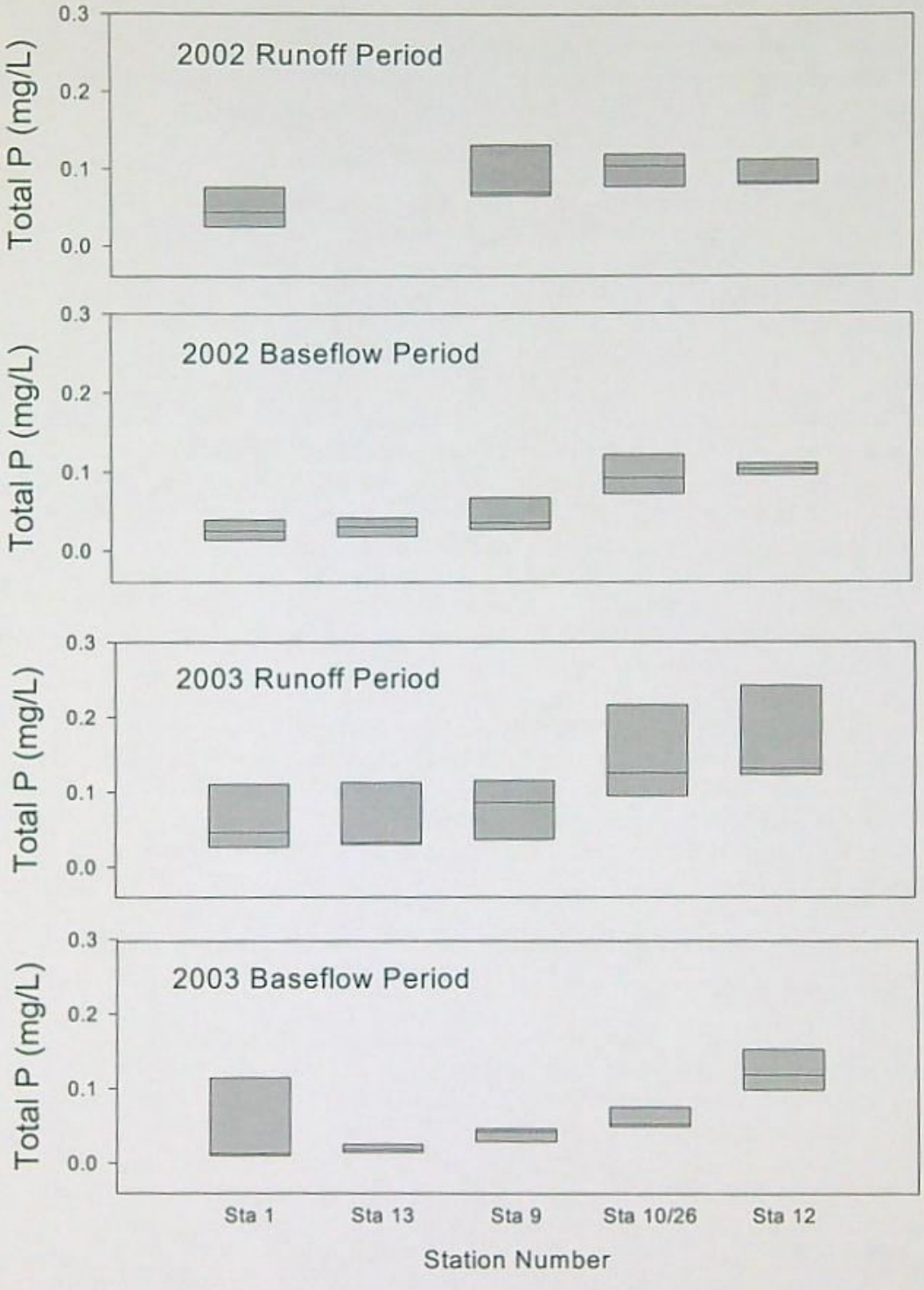

Figure 12. Total P at Blitzen River water quality monitoring stations during the runoff and baseflow periods in 2002 (top) and 2003 (bottom).

Nitrogen

Nitrogen is another macronutrient essential for primary productivity. It occurs in freshwater in numerous forms: dissolved molecular N_2, organic forms, nitrate, nitrite, and ammonia. Sources include precipitation, nitrogen fixation, and inputs from surface and ground water drainage (Wetzel, 2001).

There are three basic forms of forms of nitrogen that can be distinguished analytically: total N, nitrate-N, and ammonia-N. Total N is a measure of all N in the sample and includes solid organic and inorganic forms and dissolved forms. Most of the solid N is going to be in organic form. Nitrate is the oxidized form of dissolved N. Ammonia is the reduced form of dissolved N. Both of these dissolved forms are immediately bioavailable to organisms.

Median total N concentrations from the river sites were not significantly different from each other during the runoff period but during the baseflow period of both years, there was at least one site that was statistically different from the other sites. For individual sties, there were no significant differences between periods at any of the sites in 2002 (Table 10). In 2003, several sites had significantly higher concentrations of total N during the runoff period. These were the same sites that had significant differences in total P concentrations (see Table 8). As with total P, this may be related to the higher flows that occurred during runoff in 2003. The higher total N is likely associated with suspended organic material.

The most obvious trend in N concentrations is an increase in total N at the two most downstream sites, Station 10/26, Blitzen near Grain Camp, and Station 12, Blitzen below Sodhouse (Figure 13). During the baseflow period of both years, total N concentrations decreased along the upstream end of the refuge and then increased further downstream. This could reflect the effect of irrigation return flows. As with total P, the concentrations of total N in irrigation return flows and wetlands are much higher than in the river (Table 11). Return flows represent a greater proportion of the total flow in the river once runoff recedes in July and therefore, they would affect river water quality most at this time.

The percentage of N as nitrate and/or ammonia, also referred to as bioavailable N, ranges from 12 to 30% in the river samples. The highest fraction, 30%, occurred at Sta 1, Blitzen below Page Springs, in both years. The fraction of N as nitrate or ammonia decreased with distance downstream even as total N increased. The fraction was even lower in most of the irrigation return flows and wetlands and ranged from 2 to 14%. Mayer (2005) reported similar findings for wetlands in the Klamath Basin NWRC. The wetlands in the Klamath Basin and Malheur may be sink for bioavailable N through mineralization, nitrification, and denitrification.

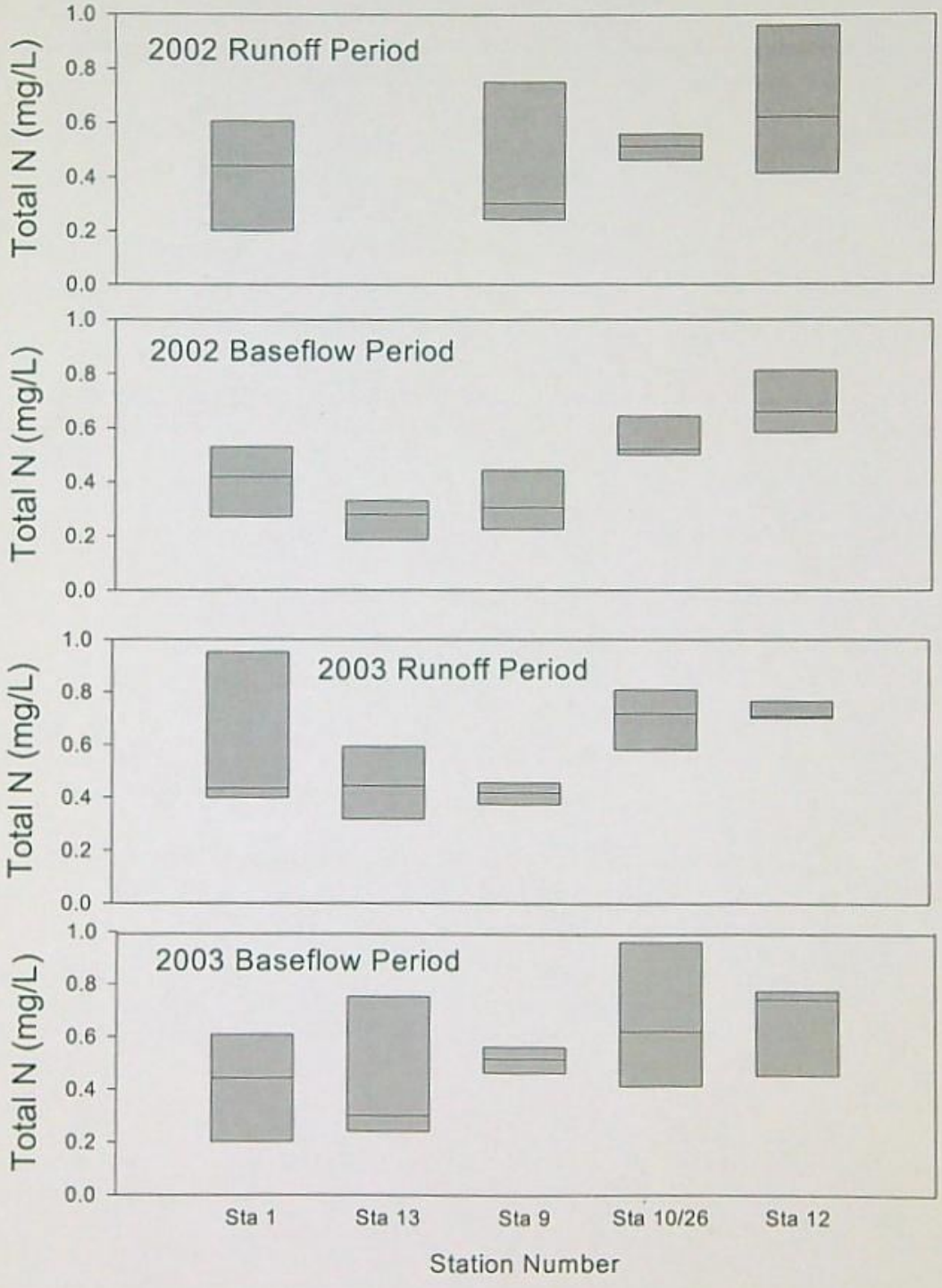

Figure 13. Total N at Blitzen River water quality monitoring stations during the runoff and baseflow periods in 2002 (top) and 2003 (bottom).

Table 10. Median values of total nitrogen (mg/L) for runoff and baseflow periods in 2002 and 2003 at Blitzen River sites from upstream to downstream. Paired values in bold are significantly different ($p<0.05$) for runoff and baseflow periods.

Station Number	Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
1	Blitzen River blw Page Springs	0.44	0.42	0.44	0.27
13	Blitzen River abv Bridge Creek	Na	0.29	**0.44**	**0.15**
9	Blitzen River at 5-Mile Bridge	0.30	0.31	**0.42**	**0.30**
10/26	Blitzen River nr Grain Camp	0.52	0.52	**0.72**	**0.38**
12	Blitzen River blw Sodlhouse	0.62	0.66	0.71	0.74

Table 11. Median values of total nitrogen (mg/L) at irrigation return flow and wetland sites in 2002 and 2003. Years without data mean no monitoring occurred.

Station Number	Station Name	2002	2003
	Faye Pond return flow channel	0.99 (n=9)	0.89 (n=10)
25	Rock Crusher return flow channel		1.08 (n=20)
17	West Knox Pond	1.50 (n=14)	2.28 (n=12)
15	Cottonwood Pond	0.78 (n=4)	1.37 (n=8)
28	Crane Pond		2.56 (n=11)

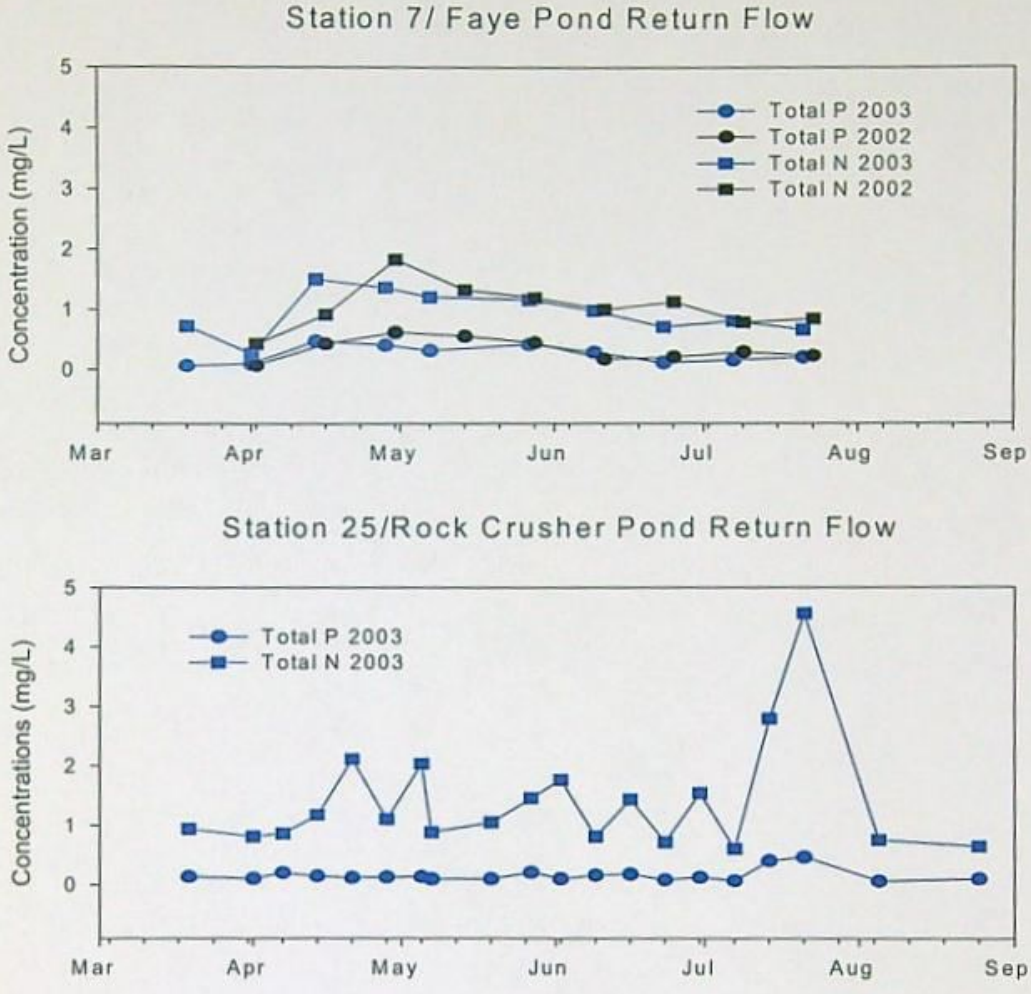

Figure 14. Total P and Total N at two return flow sites along the Blitzen River, Station 7 sampled in 2002 and 2003, and Station 25, sampled in 2003 only.

N and P in irrigation and wetland return flows

In general, concentrations of total P and total N in the wetlands and irrigation return flows are higher than the river concentrations (Figure 14). At Station 7, Faye Pond return flow, and Station 25, West Canal return flow, concentrations of TP and TN increased through spring and peaked in May, then declined in both years. At Station 25, they increased considerably in July 2003 again, especially total N, for reasons unknown. The higher concentrations early in the season could be a result of decomposition of vegetation and other organic material, including cow manure, from the previous season. This makes physical sense, however, we don't really have enough monitoring information to verify sources.

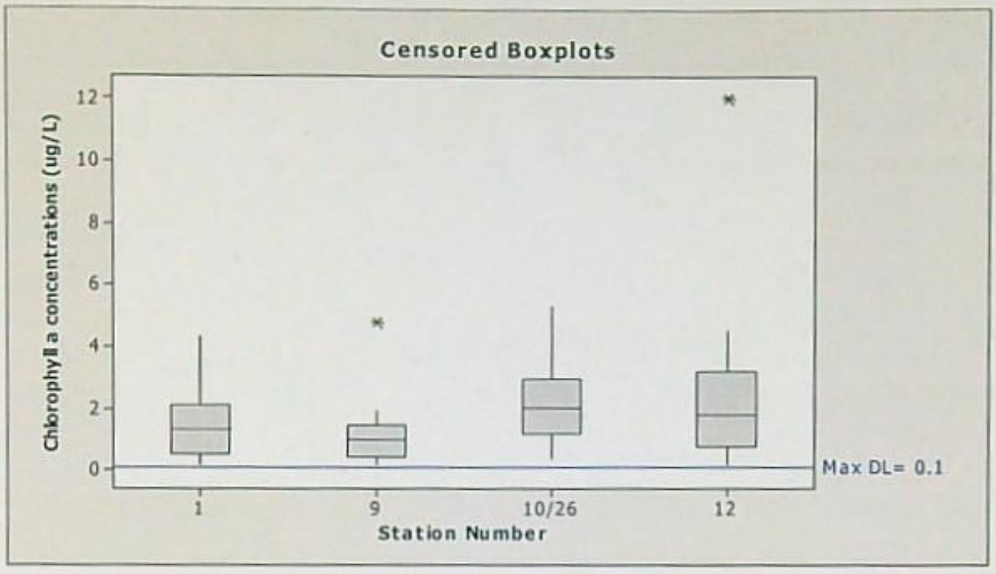

Figure 15. Censored boxplots of chlorophyll a for Blitzen River water quality monitoring stations for both 2002 and 2003.

Chorophyll a

Nutrient-rich waters can facilitate excessive algae growth and poor water quality. Chlorophyll a concentrations are an indicator of algal biomass and general water quality conditions. All plants, including algae, contain chlorophyll a. For planktonic algae, chlorophyll a constitutes about 1 to 2 % of the dry weight. The state water quality standard for chlorophyll a is 15 µg/L for rivers, but this standard does not apply to marshes.

Chlorophyll a concentrations were low overall (< 4 µg/L) and showed little variability in time or space (Figure 15). For the river sites, roughly 5% to 25% of the samples were below the detection limit of 0.1 µg/L. A Kruskal-Wallis test indicated that there were no significant differences in the medians between sites at the 0.05 level. There was a slight tendency for higher concentrations with distance downstream. Despite the availability of macronutrients, there appears to be little problem with excessive algae and euthophication in the river. The chlorophyll a concentrations represent grab samples from the water column. We did not attempt to sample for periphytic algae, only planktonic algae.

Based on TN:TP ratios, the upper reaches of the Blitzen River appear to be P-limited, with TN:TP molar ratios of >23 much of the time (Wetzel, 2001). This may be one reason for the low algal biomass in the river. P concentrations do increase downstream and the system appears to be less limited in terms of P further downstream. However, algal biomass appears low even in this reach, based on chlorophyll a concentrations in the water column.

E. coli and total coliform

E. coli and total coliform are bacteria groups that are commonly used as indicators for fecal contamination. *E. coli* is an indicator for fecal material from mammals. The state standard for *E. coli* is that the geometric mean of 5 samples collected over a one month period can not exceed 126 organisms per 100 milliliters and no single sample can exceed 406 organisms per 100 milliliters.

E. coli samples from Station 1, Blitzen below Page Springs, were very low (geometric mean of 1 organism/100 ml). Numbers increased slightly downstream at Station 10, Blitzen near Grain Camp, and Station 12, Blitzen blw Sodhouse Dam, but they were still quite low (geometric means of 10 organisms/100 ml or less). Station 7, Faye Pond return flow, and Station 17, West Knox Pond, also had low numbers (geometric means < 5 organisms/100 ml). The highest numbers of E. coli were found in samples from Station 11, McCoy Creek at Blitzen, but the numbers were still well below the standard (< 50 organisms/100 ml).

Total coliform is a broader indicator of fecal material from all warm-blooded animals. Geometric means for total coliform ranged in the low hundreds for all sites. There did not appear to be any trends downstream. There is no state standard for total coliform.

Nutrient Budgets and Mass Loadings

In the previous section of this report, we have examined how concentrations of water quality constituents change through the refuge. Now we will examine how mass loads change. A mass load is defined as concentration*discharge. We develop nutrient budgets, based on mass loads, for several river reaches, areas, and habitats on the refuge for the Apr-Sept period. These are based, in part, on water budget information developed and discussed in the previous report entitled "*Water Budgets, Net Inflow, and Consumptive Use Estimates for Malheur National Wildlife Refuge.*"

Buena Vista/Frenchglen Area

We consider the river reach between Page Springs and Grain Camp for the first nutrient budget (Figure 1 and 2). This reach of the Blitzen River flows through the Buena Vista/Frenchglen area of the refuge and nutrient concentrations will be affected by management practices in this area. The total irrigated area in the Frenchglen and Buena Vista Area is about 22,000 acres. This includes as much as 5,300 acres (24%) of open water ponds and wetlands. We developed a water budget for this area in a previous report.

Methods

We consider total mass load into this reach as the sum of mass load at Station 1, Blitzen below Page Springs, and Station 5, Bridge Creek at Blitzen. We consider total mass load out of this reach to consist of the mass load at Station 10/26, Blitzen near Grain Camp. The difference between mass in and mass out of this reach will give us an estimate of the other potential sources and sinks of nutrient mass that are not measured, including irrigation and wetland return flows, groundwater seepage, and internal loading from sediments. Negative balances (when mass out is greater than mass in) indicate sources of nutrients and positive balances indicate sinks. There are some diversions that are not accounted for in this mass budget. Diversions at Grain Camp through the Buena Vista Canal and the Grain Camp Canal are diverted upstream of Grain Camp Dam, along this reach, but return flows, to the extent that they exist, enter the river below this reach. This means that mass may be returned to the system in return flows that are not accounted for in our budget. However, it is likely that the quantity of return flow and mass is small.

Results

Table 12 presents the mass loads for total P and total N by year and period. Generally, loads were much higher during the runoff period than the baseflow period, primarily because of the higher flows. This makes sense; more mass moves in and out of the river reach under higher flows. The higher flows in the 2003 runoff period compared with the 2002 runoff period resulted in higher mass loads as well. There was a tendency for total N to be reduced (positive differences) and total P to be increased (negative differences) through the reach, but the only statistically significant difference between inflow loads and outflow loads occurred for total P in the baseflow period in 2002. Other than that period, the variability was too large to identify significant differences.

Analyses of the concentration data above suggested that wetland and/or irrigation return flows were a potential source of total P in the river. The load differences, although statistically weak, support this as well.

Table 12. Mean Total P and Total N mass loads and standard errors (kg/period) for the Blitzen River between Page Springs and Grain Camp for runoff and baseflow periods in 2002 and 2003. Paired values of inflow loads and outflow loads in bold are significantly different ($p<0.05$).

Station Name	2002 runoff	2002 baseflow	2003 runoff	2003 baseflow
TP inflow loads	3155 ± 514	**363 ± 48**	4731 ± 1160	619 ± 342
TP outflow loads	3100 ± 226	**812 ± 108**	7389 ± 1617	515 ± 52
Difference	55	-449	-2568	104
TN inflow loads	23961 ± 4334	4884 ± 708	40070 ± 7514	4548 ± 1141
TN outflow loads	17590 ± 1957	4479 ± 325	30580 ± 2671	3424 ± 744
Difference	6371	365	9490	1124

Westside P Ranch Area

Next, we consider an area of lands rather than a specific river reach. The area is the Westside P Ranch Area, defined as the 4,000 acres of irrigated lands south of 5-Mile Road, bounded to the south and west by West Canal and to the north and east by the Blitzen River (Figure 2). In 2002, this area included only about 120 acres (3%) of open water ponds and wetlands. Most of the area is irrigated wet meadow. We developed a water budget for this area for 2002 in a previous report. Here, we develop a nutrient budget for 2002 for the same area, based in part on that water budget information.

Methods

We consider total mass load into this area as the sum of the mass load at Station 2, West Canal at Blitzen, and Station 4, Highline Flume, and diversions at New Buckaroo and Old Buckaroo. We consider total mass load out of this reach to consist of return flows at Station 8, Jones diversion, and Station 7, Faye Pond return flow, and Station 6, West Canal at 5-Mi Road. The difference between mass in and mass out will give us an idea whether water and habitat management practices in this area serve as a source or sink for nutrients. We measured flows continuously at both sites on West Canal and upstream and downstream of the New Buckaroo and Old Buckaroo diversions. We measured flows periodically at Faye Pond return flow, Jones diversion, and Highline Flume. Concentrations at Station 1, Blitzen below Page Springs, were assumed to be representative of concentrations at West Canal, Highline Flume, and New and Old Buckaroo diversion. Concentrations at Faye Pond return flow were assumed to be representative of Jones diversion as well. Concentrations at West Canal at 5-Mi Road were collected and measured as part of the study.

Results

Table 13 presents the mass loads for total P and total N for the runoff and baseflow period in 2002. As with the Blitzen River reach, much more mass moved during the runoff period compared with the baseflow period. The Westside P Ranch area is a source of total P and total N (negative differences for both nutrients during both periods), with statistically more nutrients exported from the area than moving into the area, with the exception of total N during the runoff period. In terms of mass percentage, there was more total P exported than total N. The area appears to be more of a source of P than N. This could be due to the wetting/drying cycle that occurs in these wet meadow areas since these areas are only irrigated until about the 3rd week of July. The annual drying cycle allows oxidation of newly-formed organic matter and release of nutrients, especially P, which then move into the water column upon flooding (Reddy et al., 1999; Mayer, 2005). Furthermore, wet meadows are dominated by annual vegetation, as opposed to perennial vegetation. The predominance of annual vegetation may result in less P being translocated back into the below-ground biomass at the end of the growing season and more being released into the water column upon flooding (Mayer, 2005). Mayer (2005) reported export of P from seasonally flooded wetlands in the Klamath Basin, for similar reasons.

Table 13. Mean Total P and Total N mass loads and standard errors (kg/period) for the Westside P Ranch area for runoff and baseflow periods in 2002. Paired values of inflow loads and outflow loads in bold are significantly different ($p<0.05$).

Station Name	2002 runoff	2002 baseflow
TP inflow loads	**782 ± 155**	**69 ± 14**
TP outflow loads	**2433 ± 513**	**458 ± 43**
Difference	-1651	-389
TN inflow loads	6254 ± 1316	**1036 ± 213**
TN outflow loads	8170 ± 1054	**1741 ± 55**
Difference	-1646	-705

The total P outflow load from this area is considerable when compared to the total P mass load in the river for the same period. This is less true for total N. Based on these results, we can assume that return flows from seasonally-flooded wet meadow habitat are contributing to P concentrations in the river. This source is likely responsible for part of the increase in P concentrations downstream. However, based on the low chlorophyll a concentrations in the river, concerns with increased P concentrations and eutrophication do not seem to be warranted at this time.

CONCLUSIONS

Based on the water quality results from this study, the main water quality parameters of concern in the Blitzen Valley are conductivity, dissolved oxygen, turbidity and suspended sediment, total P, and total N. Dissolved oxygen decreases and conductivity, turbidity, suspended sediment, total P, and total N increase with distance downstream. Low dissolved oxygen concentrations, in particular, are a big concern downstream during the summer baseflow period. Concentrations are below state standards at downstream sites. Irrigation and wetland return flows are contributing low DO- and higher BOD-waters to the river and may be responsible for some of the low concentrations further downstream. But warmer temperatures downstream also undoubtedly contribute to the DO decreases.

Late season increases in river turbidity and TSS may be related to dam operations. These two parameters increase at about the time that the dams are opened up, in late July and early August.

The timing of conductivity increases downstream on the river seems to implicate return flows as sources of higher conductivity water. The return flows are generally much higher than the river conductivities. The increases downstream in the river are observed to occur through the irrigation season and reach maximums in late July, coinciding with the end of the irrigation season on the refuge.

Return flows are also implicated as a potential source of nutrients to the river. Concentrations of both macronutrients are higher in the return flows and they increase downstream in the river. The wetlands, particularly the wet meadows, appear to be a source of P and possibly N, based on the nutrient budget for the Westside P Ranch Area.

Despite the fact that nutrient concentrations increase downstream, there does not seem to be much of a problem with eutrophication and planktonic algae in the river. Concentrations of chlorophyll a are very low throughout the river. This may be because of limited P availability, based on P concentrations and N:P ratios in the river.

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West Knox Pond Water Budget and Water Quality

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INTRODUCTION

The purpose of this report is to describe and evaluate the existing water quality conditions in West Knox Pond, a permanently flooded wetland, at Malheur NWR, for the May through September period of 2002 and 2003 (Figure 1). We present summary statistics for various water quality parameters, estimate nutrient loads, and evaluate water quality impacts from management activities at this wetland. A water budget was determined for this area in a previous section of this report.

METHODS

Instantaneous measurements of field water quality parameters were collected from the inflow and outflow of West Knox Pond from the beginning of April through the end of September in 2002 and 2003. The measurements were collected every two to three weeks, with more frequent measurements during the summer. Parameters measured included water temperature, conductivity, pH, dissolved oxygen, and turbidity. Water temperature and conductivity were measured with an Orion Conductivity Meter, model 115. pH was measured with a Orion pH meter, model 210, and a glass electrode. Turbidity was measured with a Hach turbidimeter. All meters were calibrated prior to use each day. Dissolved oxygen was measured colorimetrically with a Hach Digital Titrator and DO kit.

Hourly continuous measurements of water temperature, conductivity, pH, and dissolved oxygen were also collected with Hydrolabs. The Hydrolabs were calibrated before deployment and the calibration was checked after deployment. The Hydrolabs were deployed concurrently for 96 hour periods approximately every two to three weeks. In 2002, Hydrolabs were deployed concurrently at both the inflow and the outflow. We compared the paired hourly measurements from the Hydrolabs at the inflow and outflow using a Wilcoxon signed rank test. In 2003, Hydrolabs were deployed at the outflow only.

Hourly measurements of water temperature were also collected continuously for the entire season at the inflow and outflow of the pond, using Optic Stowaway temperature sensors. In 2002, the Stowaway at the outflow was lost at the beginning of the summer so there are not continuous data at this site for the entire season. There is a complete record of temperature at both sites for 2003. Seven-day-average maximum temperatures were calculated using the continuous hourly measurements. The state water quality standard for temperature is based on a seven-day-average maximum. The value is computed on a given day by averaging the daily maximum temperature from the current day and the three days preceding or following the current day. In 2002, such calculations could not be done for the outflow since continuous data were not available at this site for the entire season.

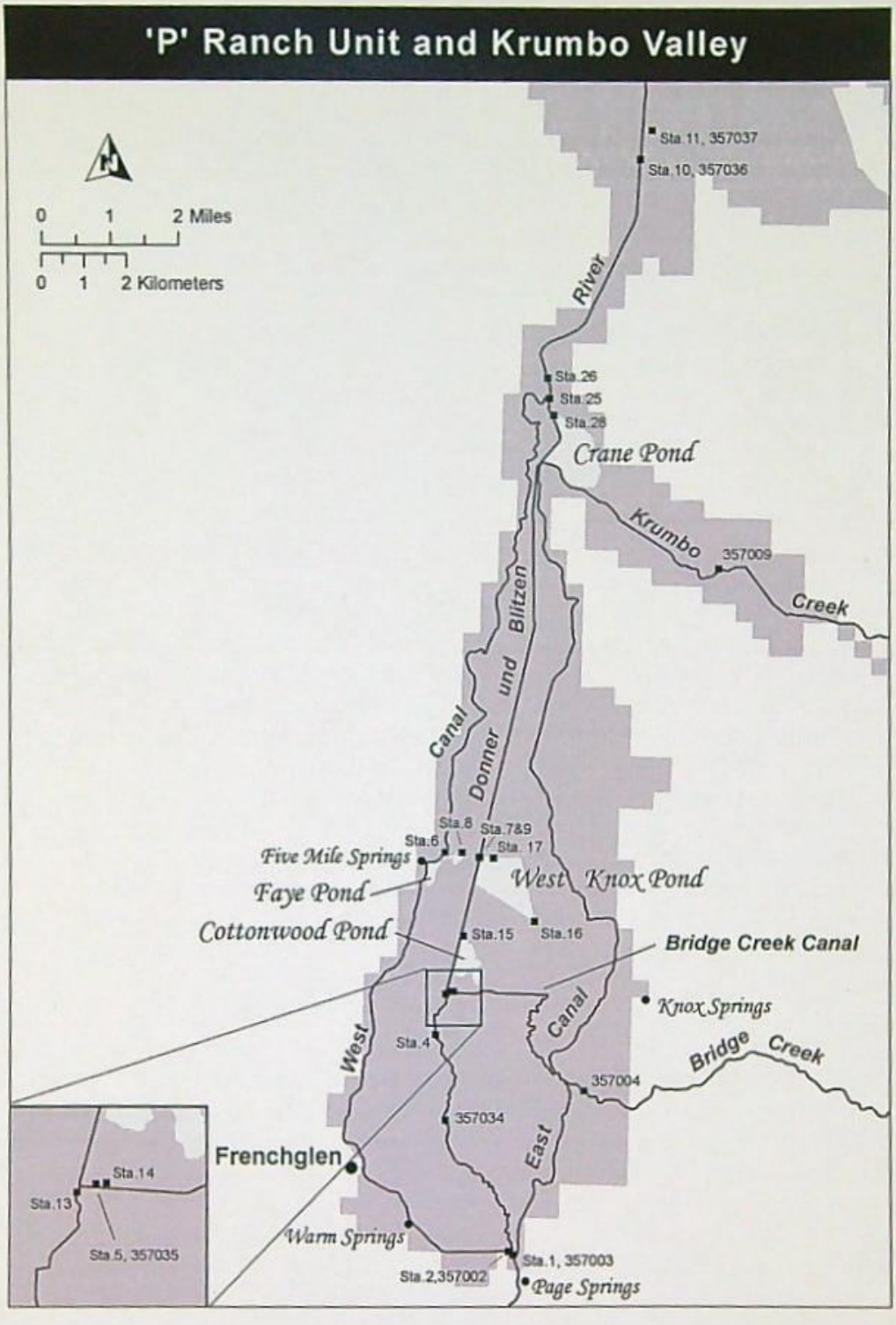

Figure 1. Map of Frenchglen area of the Blitzen Valley showing monitoring sites, springs, wetlands, and geographic features referred to in this study.

Water quality samples were collected for laboratory analyses of soluble reactive P, total P, ammonia-N, nitrate- and nitrite-N, total N, biological oxygen demand, and total suspended solids. For this study, the analytical sum of nitrate and nitrite is assumed to be nitrate and will be referred to as such. Several samples were analyzed for E. coli and total coliform as well in 2002. Chlorophyll a was analyzed semi-regularly in 2002 and in every sample in 2003. All laboratory analyses used standard analytical methods.

Measurements at the outflow were collected in the wetland near the outflow structure, regardless of the volume of outflow occurring at the time of sample collection. These are referred to as outflow samples and measurements, even if there was no outflow at the time they were collected.

Water Quality Monitoring Results and Discussion

Water Temperature

The State of Oregon water quality standards state that the "seven-day-average maximum water temperature for streams identified as having redband trout use must not exceed 20.0° C (68.0° F)." While West Knox Pond does not have redband trout use, the surface outflow is tributary to the Blitzen River which is redband habitat. Water temperatures in the West Knox Pond outflow exceeded the state standard from the end of May to the beginning of September in 2003 (the only year for which there is a complete record at the outflow) (Figure 2). There was some thermal stratification in West Knox Pond and the Optic Stowaway sensor at the outflow was positioned near the bottom of the water column in 2003. It is possible that water temperatures near the surface were even greater than what is reported here. This is significant since the outflow structure is designed to take water from the top of the water column. The Hydrolabs were positioned closer to the surface of the water column and we believe the data from the Hydrolabs better represent surface water temperatures.

Outflow temperatures equaled or exceeded inflow temperatures during most of the 2003 season (Figure 2). On average, outflow temperatures were 0 to 4 degrees greater than inflow temperatures for both years. There difference between the two sites is close to zero in early spring but increases to a maximum in July and August. This is expected since the quiescent water in the shallow wetland is warmed to a greater degree than the inflow from Bridge Creek, as air temperatures increase throughout the summer. However, the water in the inflow also warms throughout the season. Both Bridge Creek and the Knox Pond diversion canal are channelized above the West Knox inflow structure and water slows and warms in these sections of the stream (ODEQ, 1999). Inflow water temperatures at West Knox Pond exceeded the Oregon standard from the end of May through the beginning of August, with the exception of a few days in June, in both 2002 and 2003. Bridge Creek is redband trout habitat. An examination of the 2003 temperature data from Bridge Creek at the Blitzen (Station 5), downstream of the Knox Pond

diversion canal, showed that the temperature standard was exceeded for most of July and August in 2003.

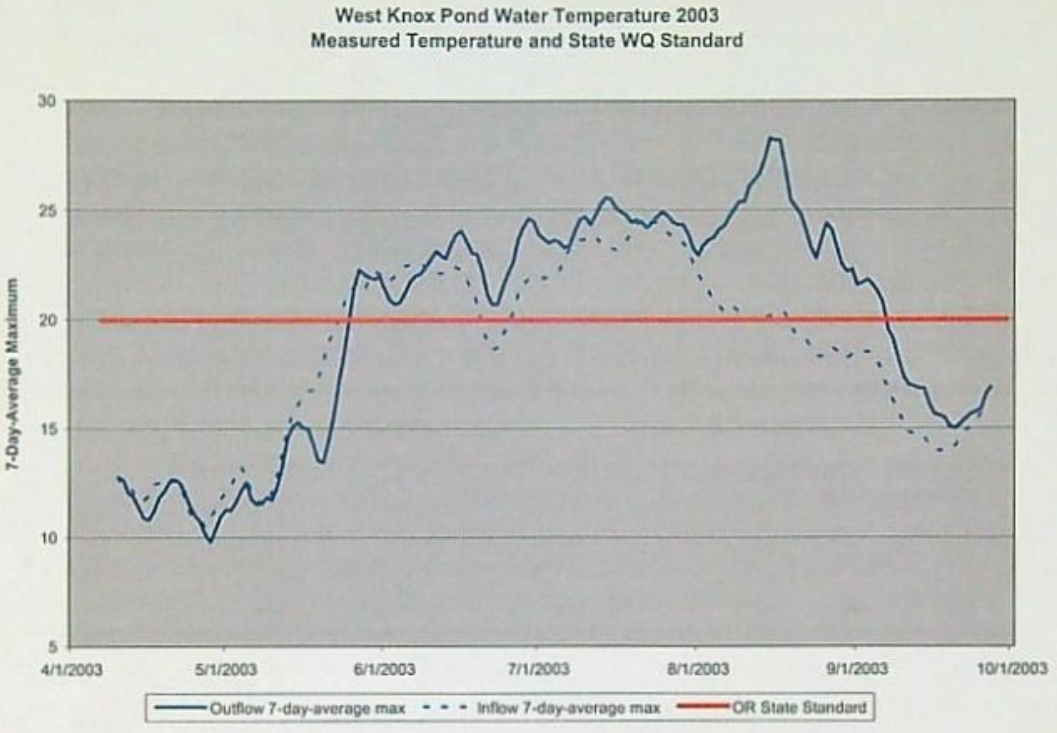

Figure 2. Seven-day-average maximum water temperatures from 2003 at the inflow and outflow of West Knox Pond.

The hourly Hydrolab temperatures in the West Knox Pond outflow for four 96-hour deployments during July through mid-August are plotted by year in Figure 3. The mean temperature during the July through mid-Aug period was 22.8° C in 2002 and 23.5° C in 2003. There was a slightly greater range in 2003 with a maximum temperature of 32° C, compared with a maximum of 29.7° C in 2002. The warm air temperatures in 2003 may have been a factor in the high water temperatures observed in 2003. Despite this difference, water temperatures for the two years were not statistically different during the July through mid-August period.

The Blitzen River is the receiving water for the outflow from West Knox Pond. The 5-Mile Bridge site on the Blitzen is located just upstream of the confluence of the West Knox outflow drain and the river. The 2003 West Knox outflow mean daily temperatures for the 2003 season were 1.9° C warmer than the mean daily water temperatures in the Blitzen River at 5-Mile Bridge. A paired t-test showed that the difference between the wetland outflow and the river was significant ($p=0.000$). The difference was greatest during the spring and decreased in the summer (Figure 4). When air temperatures increased around mid-May, water temperatures in West Knox Pond responded almost immediately but water temperatures in the Bitzen River at 5-Mile Bridge increased much more slowly, because of the high flows at this time of year. As river flows decreased toward the end of June, water temperatures in the river increased as well and were similar to West Knox Pond water temperatures for the remainder of the season (Figure 4). The quiescent water in the wetland warm more rapidly with increasing air temperatures than the river, especially at higher river flows. 2002 shows a similar pattern, with water temperatures in the West Knox outflow exceeding the river during mid-May and June but close to the river later in the summer.

The West Knox inflow mean daily temperatures for the 2003 season were, on average, 2.1° C higher than the mean daily water temperature in the Blitzen at Page Springs, the initial source of much of the inflow (Figure 4). A paired t-test showed that this difference was significant ($p=0.000$). Like the outflow and the river, the difference in mean daily temperatures between the wetland inflow and the river at Page Springs was greatest in spring (8 to 10° C) and decreased in summer. This appears to be related to differences in flow at the two sites. The inflow to West Knox, and the flow in Bridge Creek is channelized, regulated, and consistently low. This water warms quickly in the spring. By contrast, the flows in the Blitzen at Page Springs are relatively higher, especially in spring, and do not warm as quickly until the high flows recede. This results in a temperature difference between the two sites that is maximized in spring and diminishes during summer. Flow influences water temperatures throughout the refuge.

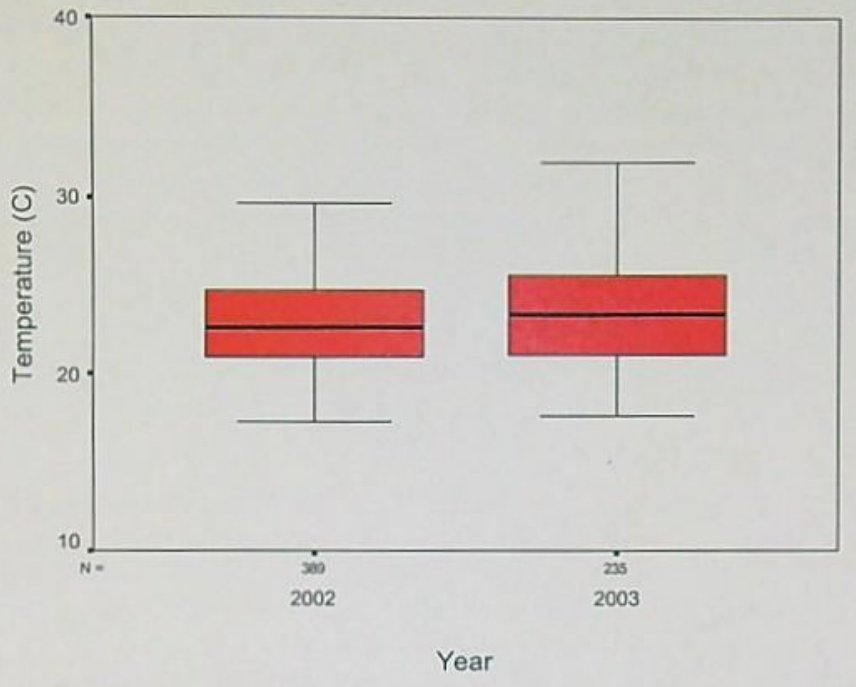

Figure 3. Box plots of West Knox outflow hourly temperatures for July through mid-August in 2002 and 2003. In a box plot, the center line is the 50th percentile or median, the box spans the 25th to 75th percentile and the whiskers span the range of the data.

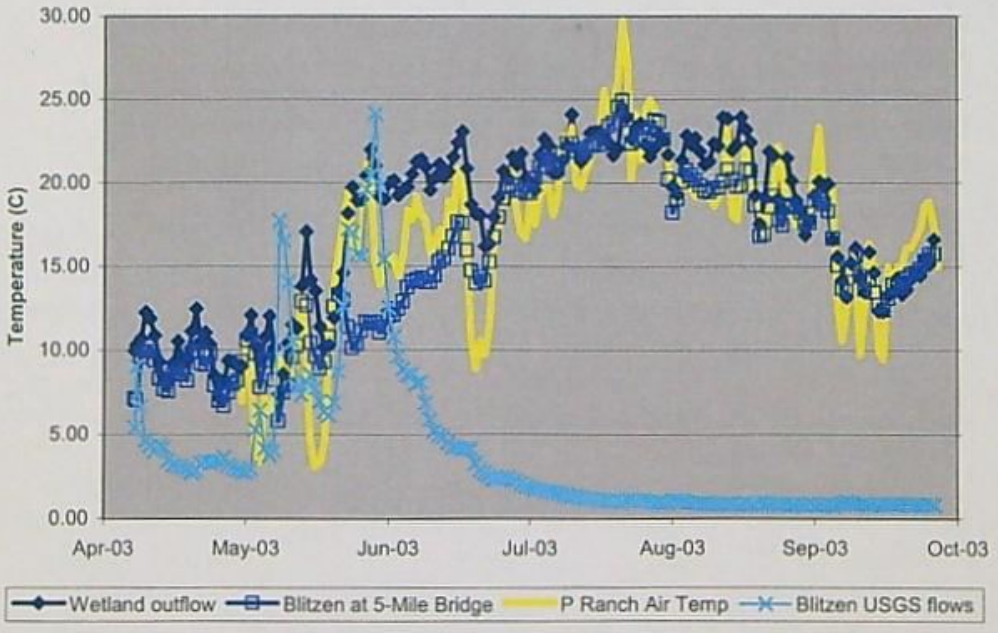

Figure 4. Comparison of Mean Daily Water Temperatures in the Blitzen River at 5-Mile Bridge and West Knox Pond Outflow, Mean Daily Air Temperatures at P Ranch, and Mean Daily Flows at the USGS Site 10396000 Blitzen near Frenchglen, OR 2003

Conductivity

The concurrent Hydrolab measurements at the inflow and outflow in 2002 showed that the outflow conductivity was significantly higher than the inflow ($p=0.000$). In 2002, the average inflow conductivity was 94 µS/cm and the average outflow conductivity was 167 µS/cm. The higher conductivity in the wetland is due to evaporative concentrations of salts and the dissolution of residual salts in the wetland. There was little change in conductivity over the season in 2002. In contrast, the conductivity of the outflow increased from an average of 133 µS/cm to 189µS/cm from May through August 2003. The seasonal increase in 2003 may have been partly a result of the low volume of outflow from the wetland in 2003.

pH

pH in the wetland outflow averaged 7.8 in 2002 and 8.0 in 2003. pH ranged as high as 10.15 in June 2003, as measured with the Orion pH meter, although maximum values from the Hydrolab only reached about 9.4 that year. Hourly pH as measured with the Hydrolab at the inflow and outflow in 2002 were compared using a Wilcoxon signed rank test. pH was significantly higher in the outflow as compared to the inflow for all periods of deployments ($p=0.000$). This is due to the greater algal and plant productivity in the wetland. Carbon dioxide is consumed through photosynthesis and results in an increased pH. pH in the wetland outflow also exceeds the pH of the river, for the same reason. The Oregon state water quality standard for pH is 7.0 to 9.0. Wetland outflow exceeded this standard for a small part of the season during both years although the Oregon standard states that waters impounded by dam may have pHs that exceed this.

Dissolved Oxygen

Dissolved oxygen concentrations and % saturations differed between spring and summer in both years. Mean concentrations decreased and were significantly lower ($p=0.000$) in the summer as compared to the spring in both 2002 and 2003 (Figure 5). However, the range of concentrations increased in the summer, with higher maximums and lower minimums. Minimum concentrations were < 1.0 mg/L in July in both years with a slight recovery in late summer. The minimum dissolved oxygen corresponds to the month of maximum water temperatures.

The decrease in means and increase in variability reflect the response to photosynthesis and respiration in the pond. As temperatures warm and solar radiation increases, algal productivity and algal decomposition are increased as well. Algal photosynthesis releases dissolved oxygen into the water column while decomposition of algal biomass consumes it.

Paired measurements of dissolved oxygen concentrations in the inflow and outflow of West Knox Pond were compared in 2002 (Figure 6). Concentrations in the outflow were significantly lower ($p=0.000$, $n=650$ paired measurements) than the inflow. The mean inflow concentration was 7.17 mg/L and the mean outflow concentration was

5.64 mg/L. The difference in the means was 1.53 mg/L. The range of concentrations in the outflow exceeded the inflow, especially in summer, reflecting greater algal activity and decomposition in the wetland.

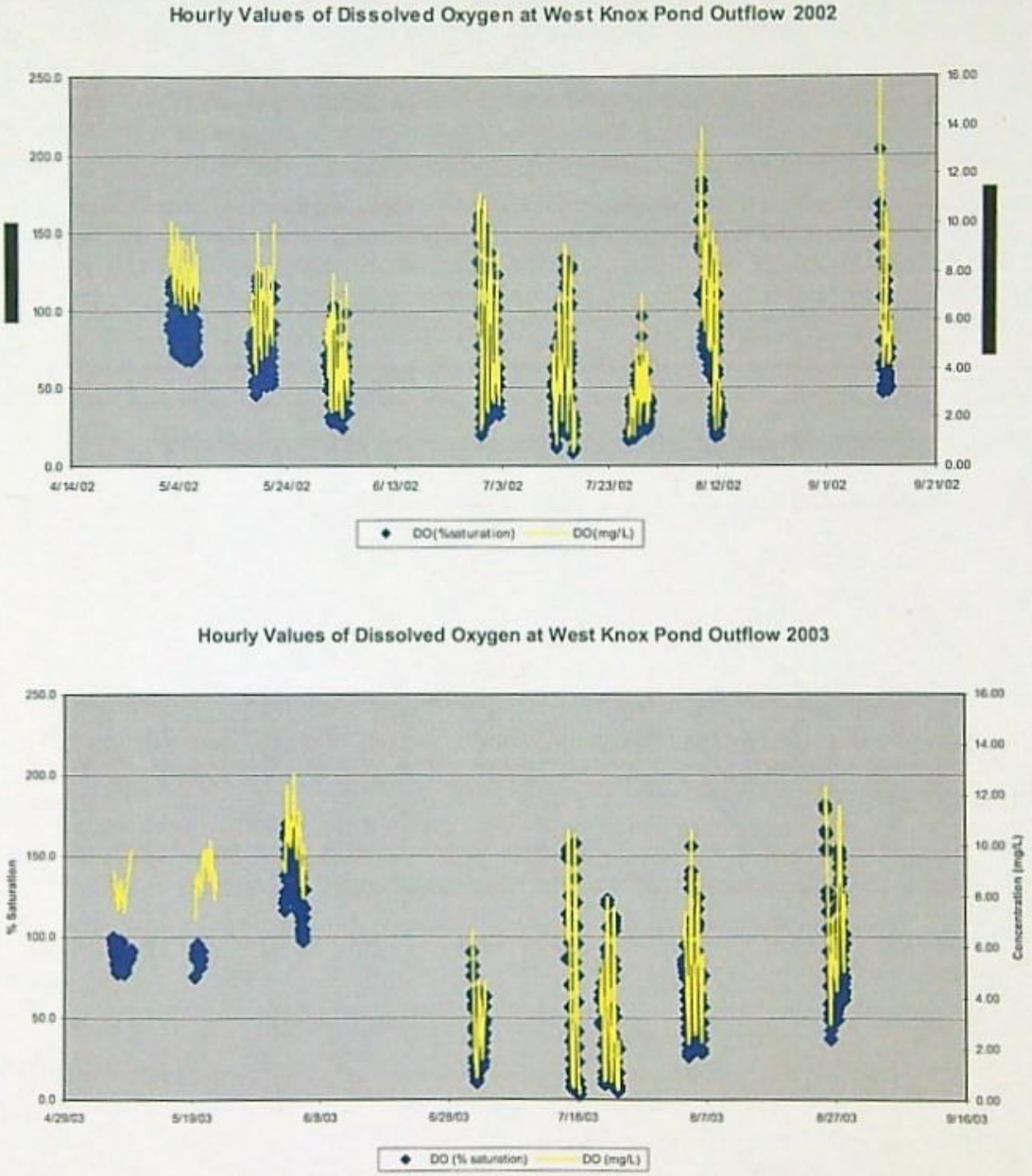

Figure 5. Hourly values of dissolved oxygen at the West Knox Pond outflow in 2002 (top) and 2003 (bottom) as collected by the Hydrolabs. Symbols are percent saturations and lines are concentrations.

Nutrients

Phosphorus is frequently the nutrient that limits primary productivity in freshwater systems (Wetzel, 2001). As a result, when P concentrations are increased, the result is more plant or algae growth. P concentrations greater than 0.1 mg/L are characteristic of eutrophic waters (Smith et al., 1999). Total P and soluble reactive P concentrations in the wetland outflow averaged 0.53 mg/L and 0.25 mg/L, respectively, for both years (Figure 7), indicating the wetland is eutrophic. The two years were similar in terms of concentrations and trends. The outflow concentrations are about an order of magnitude greater than P concentrations in the Blitzen River at 5-Mile Bridge or the West Knox inflow (Figure 7). Blitzen River at 5-Mile Bridge total P and soluble reactive P concentrations averaged 0.064 mg/L and 0.024 mg/L, respectively for both years. West Knox inflow total P and soluble reactive P concentrations averaged 0.053 mg/L and 0.030 mg/L, respectively for both years.

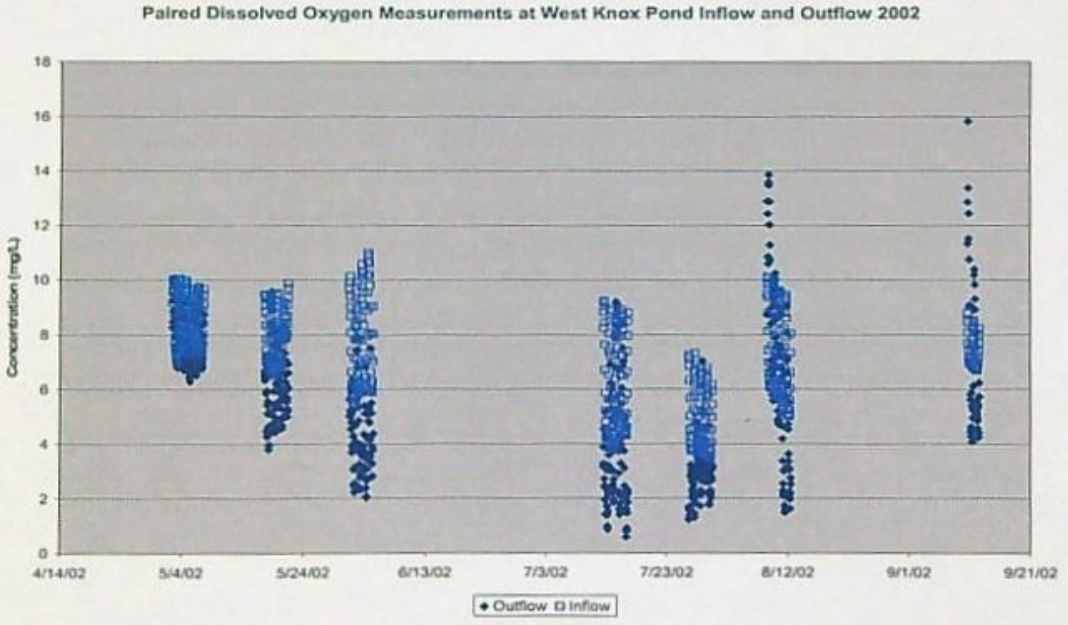

Figure 6. Concurrent measurements of dissolved oxygen concentrations in the inflow and outflow of West Knox Pond in 2002, as measured with the Hydrolabs.

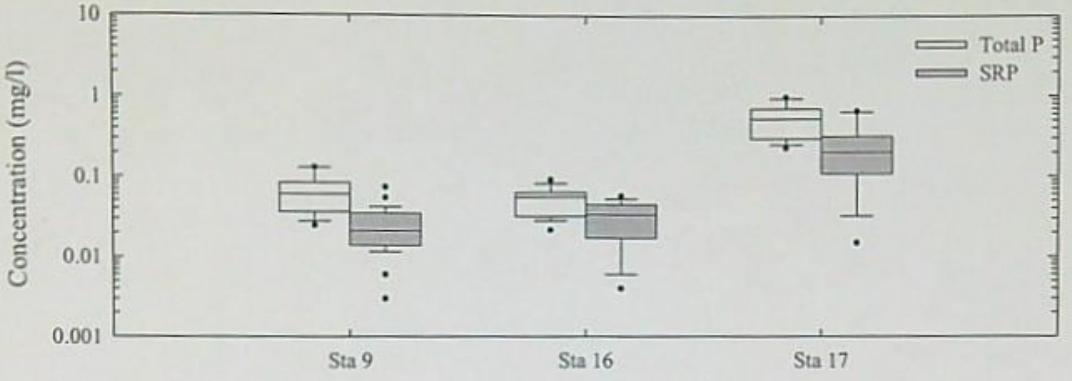

Figure 7. Box plots of total P and soluble reactive P in the Blitzen at 5-Mile Bridge (Sta 9), and West Knox Pond inflow (Sta 16) and outflow (Sta 17), for 2002 and 2003 combined. Note the log scale of the vertical axis.

The trend in P concentrations in the wetland is different from the river and inflow too (Figure 8). Phosphorus concentrations in both years increased in June, peaked in July, and then decreased slowly until the beginning of September. Average total P concentrations increased from about 0.20 mg/L in April to > 0.90 mg/L in July. Phosphorus concentrations in the river and inflow showed no seasonal trends. Crane Pond, another permanently flooded wetland, showed as similar increase in P concentrations mid-season.

An average of 58% of the total P in the inflow and 47% of the total P in the wetland outflow was in soluble reactive form. This is the dissolved form of P, as opposed to the solid form. The fraction of soluble reactive P tended to increase mid-season too so that at the highest concentrations, the fraction of soluble reactive P was greatest. The large fraction of total P in dissolved form may have implications for the chemical behavior and retention of P in the wetland (see Mayer 2005). Soluble reactive P is believed to be immediately bioavailable to plants and algae. It will sorb or precipitate with Fe, Al, and Ca forms under certain conditions. It will remain in solution rather than settling out like particulate P.

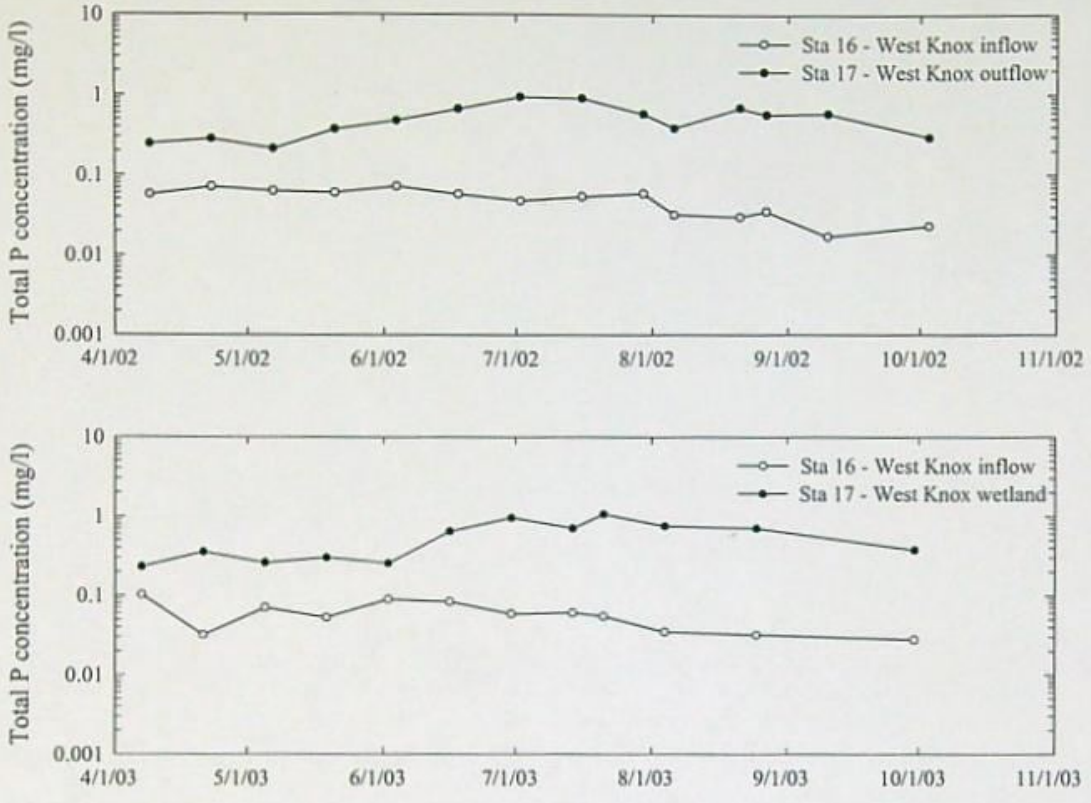

Figure 8. Season trends in total P concentrations in West Knox Pond inflow and outflow in 2002 (top) and 2003 (bottom). Note the log scale of the vertical axis.

Total N concentrations in the wetland outflow were also higher than the Blitzen at 5-Mile Bridge or the West Knox inflow. Concentrations in the wetland outflow averaged 2.07 m/L for both years. Concentrations in the river and inflow averaged 0.42 and 0.38 mg/L, respectively, for both years. Total N also increased from spring to summer in the wetland outflow, similar to P concentrations. No such trend was evident in the river or inflow. Most of the total N was in organic form rather than dissolved form. The average organic N for both years was 89% and there was little variability in this fraction over the season.

Dissolved N (nitrate plus ammonia) concentrations were more variable in the wetland outflow. Ammonia concentrations increased during the 2002 season from an average of 0.046 mg/L early season to 0.310 mg/L mid-season and 0.472 mg/L late season. Ammonia concentrations were generally lower and more constant in 2003. Average concentration were 0.114 mg/L early in the season, 0.193 mg/L mid-season, and 0.075 mg/L late season. Nitrate concentrations were usually low and ranged from non-detectable (<0.010 mg/L) to about 0.1 mg/L in both years.

Nutrient loads

Mass balance calculations showed that the wetland was a source of P and N during 2002. Outflow loads of total P and total N exceeded inflow loads by <300% and 60%, respectively. To some extent, this was due to a release of water from storage over the season. Water levels declined over the irrigation season and this served as a source for some of the exported P and N. In 2003, because of the greatly reduced outflow from West Knox Pond, the wetland retained P and N overall during the season. There was a release of P and N during the period May 1 through June 15, 2003, when there was outflow. Again, some of the nutrient load in the outflow was due to the release of water in storage.

We did not develop a water budget or nutrient budget for the entire year. Based on the data we did collect, it is not possible to say whether the wetlands are acting to retain or release nutrients overall. They do appear to be a source of nutrients when outflow occurs during the irrigation season. The export or retention of nutrients from the wetland is as much as function of water management as it is of chemical or biological processes. When no water is released, the wetlands act to store nutrients. When water is released from storage, the wetlands export nutrients, the quantity depending in part on how much water is released. Mid- or late-season outflows will release more nutrients because of higher concentrations at this time of year. It seems that nutrient concentrations in permanent wetlands at Malheur NWR increase over the summer, based on observations in West Knox Pond and Crane Pond.

Wetland outflow to the river could potentially provide a significant source of nutrients, especially P, to the river system, accelerating primary productivity and further degrading water quality in an already stressed system. There is evidence that the river system becomes progressively enriched in P as it passes through the refuge and this may be in part related to wetland outflows. Median concentrations of total P increase from 0.30 mg/L at the Page Springs Dam to 0.11 mg/L at Sodhouse Dam, almost a fourfold increase. This indicates that the system becomes more eutrophic downstream. Total N increases downstream as well, but only about double the initial upstream concentrations. The increase in P concentrations is greater relative to the increase in N concentrations downstream. The median total N:total P molar ratios decrease from 26 at Page Springs Dam to 12 at Grain Camp Dam and Sodhouse Dam. At the initial P concentrations and N:P molar ratios characteristic of water first entering the refuge, it is likely that P is limiting primary productivity (Wetzel, 2001). However, as the total P concentration increase and the N:P ratios decrease, P is less likely to be limiting downstream.

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Management Strategies for Addressing Water Quality Issues at Malheur National Wildlife Refuge

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INTRODUCTION

The purpose of this report is to summarize the general water quality issues at Malheur NWR, based on the findings from the previous reports, and discuss management strategies to address those issues.

General Findings:

Based on the results from this study, high water temperatures and low dissolved oxygen concentrations appear to be the most critical water quality issues of concern on the refuge. Water temperatures exceed the state standard even before the Blitzen flows onto the refuge and increase with distance downstream on the refuge. The most rapid increase occurs in the first 5-mile reach on the refuge.

Low dissolved oxygen concentrations are below state standards at downstream sites during the summer baseflow period. Irrigation and wetland return flows are contributing low DO- and higher BOD-waters to the river and may be responsible for some of the low concentrations further downstream. But warmer temperatures downstream also undoubtedly contribute to the DO decreases. Both high water temperatures and low dissolved oxygen concentrations are detrimental to redband trout. Management practices that improve water temperature will also help improve dissolved oxygen.

Other issues of concern are conductivity, turbidity and suspended sediment, total P, and total N. All of these parameters increase on the refuge with distance downstream. Despite the fact that nutrient concentrations increase downstream, there does not seem to be much of a problem with eutrophication and planktonic algae in the river. Concentrations of chlorophyll a are very low throughout the river. This may be because of limited P availability, based on P concentrations and N:P ratios in the river.

Irrigation and wetland return flows are responsible for some of the observed water quality problems but certainly not all of them. The timing of conductivity increases downstream on the river seems to implicate return flows as sources of higher conductivity water. Return flows are also implicated as a potential source of nutrients to the river. Concentrations of total N, total P, and BOD are higher and DO concentrations are lower in return flows.

WATER QUALITY MANAGEMENT

Proposed solutions to address water quality impairment and implications to Refuge management focus mainly on temperature and dissolved oxygen.

The proposed interim solution to restore impaired water quality (temperature, turbidity and dissolved oxygen) in the Blitzen River from Refuge-related management is based upon the concept of "protecting and restoring" ecological function as opposed to attempting to meet numerical standards. Final strategies to address water quality impairment will be developed as part of Total Maximum Daily Load (TMDL) for pollutants that are discharged to the Blitzen River. TMDL studies are conducted on "waters of the United States" that have been identified as having impaired water quality as a result of anthropogenic actions. The TMDL will be conducted by the Oregon Department of Environmental Quality (DEQ) some time in the future. Recent TMDLs conducted or are presently being conducted by DEQ in southeast Oregon focus on addressing ecosystem function to address water quality impairment.

The Oregon Department of Agriculture (ODA) method for addressing water quality impairment in the state is also based upon protecting and restoring function. In fact, the strategy to address water quality impairment from agriculture-related activities on private and State of Oregon administered lands in Harney County is based upon this concept and the implementation of Best Management Practices (BMPs) as opposed to immediate and strict enforcement of numerical standards by ODA and/or DEQ.

Therefore, the approach that Malheur NWR will take to address water quality impairment related to its management will follow suit. The Malheur NWR approach to address water quality will mirror that identified in the Greater Harney Basin Agricultural Water Quality Management Plan (GHBAWQP 2006) and the Alvord TMDL (DEQ). The GHBAWQP and Alvord TMDL identify four areas to address to protect/improve water quality in their respective drainages. They are: 1) Rangeland/upland health; 2) riparian vegetation; 3) stream morphology; and 4) floodplain connectivity. Malheur NWR has little rangeland/upland habitats within the confines of the refuge. The majority of those habitat types that surround Malheur NWR are administered by the Bureau of Land Management or are in private ownership. Therefore, Malheur NWR will focus upon three of the four areas identified.

1) Protect existing riparian shrub/tree communities and/or re-establish riparian tree/shrub communities;

2) Conduct in-stream projects to improve stream channel morphology; and

3) Where feasible, re-establish floodplain connectivity by aggrading the stream channel and/or removing dikes.

In addition, modeling data suggests that increasing base-flows during the warmest periods (July/August) will also lower temperatures in the Blitzen River. Therefore, on or around July 1st, Malheur NWR would reduce the amount of water it diverts and increase "base-flow" in the Blitzen River by 25CFS. This management action would most rapidly address water temperature and possibly dissolved oxygen and turbidity impairment to the river. However, the Refuge's ability to maintain some wetlands into late summer will be reduced.

IMPLICATIONS TO REFUGE MANAGEMENT

The implications to existing Refuge management objectives in the Blitzen Valley, although not quantifiable at this time, may be significant. However, those changes will not run counter to Refuge purpose ("as a feeding and breeding ground for migratory birds and other wildlife.") The impact will be to the current goal of maximizing the total number of acres irrigated each irrigation season and migratory bird (e.g., sandhill crane and waterfowl) production objectives. The historical wetland management strategy of the Refuge has not considered water availability (i.e., snow pack and predicted run off), water quality of the Blitzen River nor aquatic organisms dependant upon the Blitzen River. The Blitzen Valley portion of the Refuge will still provide significant high quality habitat for a wide variety migrating and breeding migratory bird species and other wildlife. However, the total number of acres of wetland habitat that are irrigated into late summer may vary significantly from year to year, more so than present. There will likely be more emphasis placed on managing seasonal wetland habitat than semi-permanent/permanent emergent marsh habitat, also referred to as "brood-rearing" wetlands.

As a result of the changes in irrigation, cessation on or around July 1 vs July 25 (based on stream flow and temperature), there will be changes to the existing haying/grazing program. Haying of meadows will need to occur approximately three weeks to one month earlier than present (July 10 vs Aug 10) to ensure that forage that is harvested remains of sufficient quality to attract local ranchers. If the forage is not of sufficient quality, there would be little reason for local ranchers to harvest the forage. Without the involvement of local ranchers Refuge wetland and meadow management would be severely affected. Changing of the hay dates would also affect permittees because they would need to adjust their operations, especially haying of private lands which typically commences in early July. This type of change in management would have to be gradually implemented.

There will be more mimicking of natural riparian and riparian wetland habitat function than present. The total length of riparian tree/shrub communities along the length of Blitzen River, tributaries, drains, etc will increase considerably from what exists presently to address the lack of shading of the river. Riparian communities along the Blitzen River are on an upward trend. However, the majority of the approximately 40 miles of the Blitzen River is in poor condition. There will need to be more flexibility in management of habitats and more variability in treatment methods and timing.

As a result of these management changes there will be shifting plant communities, some emergent marsh habitats that have formed in meadow habitats will dry out and become dominated by grasses, forbs and smaller rush and sedge species. There should be an increase in the total number of acres of moist and dry meadow and a decrease in wet meadow and emergent (cattail, bulrush & reed canary grass) dominated habitats. How invasive plant species (i.e.,perennial pepper weed, Canada thistle will respond) is unknown. It is suspected that in some areas, these invasive species may spread.

CONCLUSIONS

The bottom line is that current management paradigm in the Blitzen Valley will change by necessity. To comply with water quality standards and to provide acceptable aquatic habitat the Refuge will be required to change its present water/habitat management strategies. To what extent exactly is unknown. However, the Refuge can begin almost immediately to address water quality impairment by implementing some best management practices (BMPs). Some of these BMPs include:

1) Strictly "enforce" our existing voluntary bypass flows at all dams (15-20CFS) and ensure that bypass flows that are part of the settlement agreement are adhered to.

2) Begin to aggressively conduct riparian vegetation "restoration" along the Blitzen River and its tributaries. This includes re-shaping and/or removing dikes to allow better tree/shrub establishment and floodplain connectivity.

3) Conduct in-stream projects to reactivate floodplains in the Blitzen Valley (e.g., P-Ranch restoration project, Bridge Creek restoration, proposed Dunn Dam replacement). These types of projects will also encourage natural riparian tree/shrub establishment and increase survival of planted stock.

Exhibit E

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE 11th Avenue
Portland, Oregon 97232-4181

In Reply Refer to:
FWS/R1/ABA-EN

Gerry Clark, Water Rights Program Analyst
Water Rights Services Division
Oregon Department of Water Resources
725 Summer Street NE Suite A
Salem, Oregon 97301

February 11, 2015

Dear Gerry:

The U.S. Fish and Wildlife Service (Service) submits the attached Water Quality Monitoring Plan for the Malheur National Wildlife Refuge as required in the conditions for Permit 54164. That permit states:

Within 1 year of permit issuance, the permittee shall develop and submit a Water Quality Monitoring Plan. The Director may approve an extension of this timeline to complete the required Plan. The Plan shall be reviewed and approved by the Water Resources Department in conjunction with the Department of Environmental Quality.

The Service had requested and received an extension for the submission of the plan. We apologize for the delay. However, the monitoring described in the plan is ongoing and has been conducted for a number of years by the Service. We would be happy to discuss the plan with Oregon Water Resources Department and Oregon Department of Environmental Quality, if necessary.

Sincerely,

Tim Mayer
Supervisory Hydrologist

Water Quality Monitoring Plan, Malheur NWR

Tim Mayer
Supervisory Hydrologist
Water Resources Branch
Region One Regional Office, USFWS
tim_mayer@fws.gov

February 9, 2015

The U.S. Fish and Wildlife Service (Service) holds Oregon Water Right Permit No. 54164 on the Malheur National Wildlife Refuge (NWR). The purpose of the right is wildlife refuge management and the season of use is Oct 1 to Mar 1. The source of water for the right is the Donner und Blitzen River (Blitzen), and Bridge Creek, Kiger Creek, McCoy Creek, Mud Creek, and Krumbo Creek, which are all tributary to the Blitzen. The Oregon Water Resources Department (OWRD) has determined that the public interest in this use, as described by the type of use, place of use, and point of diversion, is "High" and the permit is conditioned to protect instream values including habitat for redband trout as set out in the specific permit conditions. One of these specific permit conditions is to develop and submit a Water Quality Monitoring Plan. The following plan has been developed and submitted by the Service to comply with this permit condition.

Introduction

Malheur NWR is located in Harney Basin in southeastern Oregon (Figure 1). The refuge serves as a major feeding, resting, and nesting area for migratory waterfowl, shorebirds, marsh birds, colonial nesting waterbirds, raptors, and passerine bird species. The refuge encompasses 187,000 acres of open water, wetlands, springs, riparian areas, irrigated meadows and grain fields, and uplands. The value of much of the habitat on the refuge is largely dependent on the availability and management of water. The Blitzen Valley is some of the most intensively managed and most productive habitat on the entire refuge.

The Blitzen River begins on Steens Mountain and flows north to Malheur Lake through the Blitzen Valley unit of the refuge. The infrastructure for water management in the Blitzen Valley was developed in the early 1900s, prior to the refuge acquisition, as part of a system of dikes, canals, drains, and channelization, to facilitate grazing and farming. The water distribution system still exists and is used by the refuge to manage water for wetland and meadow habitat in the Blitzen Valley.

Habitat management practices on the refuge include vegetation manipulation, through haying, burning, flooding, irrigation, draining. Much of the flooding and irrigation on the refuge is accomplished by pooling water behind a series of dams along the Blitzen River within the refuge. The water is then diverted via canals into numerous meadows and wetlands and can return to the Blitzen River by surface

sheet flow, return flow ditches or pipes, or subsurface seepage. Irrigation mostly occurs from March through mid to late July in the Blitzen Valley.

In addition to irrigation, the refuge manages meadow habitat through haying and grazing to provide short-grass feeding habitat or dense nesting cover for greater sandhill cranes and other migratory birds. In August, after the cessation of irrigation, local ranchers (permittees) hay meadows to meet Refuge habitat objectives. The permittees either remove the hay to feed livestock or stack it into small piles or windrows in the hay meadows. Cattle are then grazed in hayed meadows during the fall and winter (e.g. 30,806 total AUMs from September 2013 through January 2014). The method of providing forage for cattle is referred to as rake-bunch grazing. In spring, the young grass shoots and invertebrates associated with the rakebunch grazing meadows are the preferred food for cranes, geese, ducks, and shorebirds migrating through the refuge.

The Blitzen River and its tributaries also support a substantial population of the Great Basin redband trout, a native rainbow trout/steelhead that inhabits lakes and streams east of the Cascade Mountains. The Great Basin redbands have been isolated in closed basins for several thousand years (USFWS 2000). The species was petitioned for listing based on habitat degradation that resulted from livestock grazing, some irrigation practices, stream channel manipulations, and reduced riparian vegetation. The USFWS determined that listing was not warranted at the time (USFWS 2000). However, there is still considerable interest in this species from both a native fish and a trophy fisheries perspectives.

Refuge management practices for management of migratory bird habitat have the potential to adversely impact water quality. Water management on the refuge during some periods may decrease flows, exacerbate high water temperatures, reduce dissolved oxygen concentration, increase turbidity, increase nutrient loading, and degrade fish habitat. The Blitzen River is a 303(d) listed stream for water temperature, dissolved oxygen, and turbidity. This 303(d) listing is based on statewide criteria that incorporate information from systems with characteristics that are unlike the Blitzen River. The completion of a Total Maximum Daily Loading study for this system may change the required standards for this system.

Previous Study

The Water Resources Branch (WRB) in the Regional Office of the US Fish and Wildlife Service is responsible for monitoring water quantity and water quality on the Blitzen River and its tributaries at Malheur NWR. In 2002 and 2003, WRB conducted a 2- year water quality monitoring study in the Blitzen Valley, with the refuge's assistance. WRB coordinated with Oregon Department of Environmental Quality in developing monitoring, sampling, and QA/QC protocols for the study.

A report entitled "Hydrology and Water Quality at Malheur National Wildlife Refuge" (Mayer et al., 2006) summarizes the results from that study. The goal of this study was to assess the impacts to water quantity and water quality that are associated with refuge water and habitat management (irrigation of hay and rake-bunch meadows, grazing, surface and subsurface return flows from both wetlands and agricultural fields, dam operations) and to assess BMPs that may be used to address water

quality concerns. In addition, in response to the requirement for a Water Quality Monitoring Plan in water right permit P54164, an additional study purpose was to quantify the extent of water degradation associated with current management practices on the refuge and use this information to prepare a water quality monitoring plan for future monitoring.

The study results were presented in eight independent reports, organized into four separate sections. The first section consists of three reports that examine historical flow information from the Blitzen River, Bridge Creek, and springs on the refuge. This section addresses the question "*How much water has the refuge typically received in the past*?" The second section consists of one report that develops water budgets for several different wetlands and areas on the refuge. Consumptive use is estimated and compared for different habitats. The timing of water needs is examined for various areas and habitats. The section addresses the question "*How much water does the refuge typically need for habitat management and when does it need it*?" The third section examines the water quality impacts of water management on the refuge in three reports. Water temperature in the Blitzen River is identified as the major water quality issue of concern on the refuge. The first report in this section analyzes the causes of elevated temperatures and discusses modeling results and management alternatives to improve water temperatures. The second report examines water quality conditions and nutrient budgets in the Blitzen River and surrounding areas. The third report focuses water quality and nutrient loading from a permanently-flooded wetland, West Knox Pond. The section addresses the primary question of the study: "*What are the water quality impacts of refuge water management on water quality in the river*?" The final section discusses the management implications of the results from the study. The general findings pertaining to water quality are presented and management strategies addressing these issues are discussed. The section addresses the question "*What management actions can be implemented to mitigate water quality problems on the refuge*?"

The general findings from the study are summarized here:

1) Based on the results from this study, high water temperatures and low dissolved oxygen concentrations are the most critical water quality issues of concern on the refuge. Water temperatures exceed the state standard even before the Blitzen flows onto the refuge and increase with distance downstream on the refuge. The most rapid temperature increase within the refuge occurs in the first 5 miles as the river enters the refuge, due to a combination of low stream channel gradient and reduced topographic and riparian shading.
2) Low dissolved oxygen concentrations are below state standards at downstream sites during the summer baseflow period. Irrigation and wetland return flows are contributing low DO- and higher BOD-waters to the river and may be responsible for some of the low concentrations further downstream. But warmer temperatures downstream also undoubtedly contribute to the DO decreases. Both high water temperatures and low dissolved oxygen concentrations are detrimental to redband trout, although Rodnick et al. (2004) found that redband trout have an enhanced ability to function and thrive at warmer temperatures than most salmonids. Management practices that improve water temperature will also help improve dissolved oxygen.

3) Other issues examined in the study included conductivity, turbidity and suspended sediment, total P, and total N. All of these parameters increase on the refuge with distance downstream. Increases in nutrients, turbidity, and suspended sediment downstream may result from increased carp activity. The refuge has made a strong effort to address invasive carp in the system. Despite the fact that nutrient concentrations increase downstream, there does not seem to be much of a problem with eutrophication and planktonic algae in the river. Concentrations of chlorophyll a are very low throughout the river. This may be because of limited P availability, based on low P concentrations and high N:P ratios in the river.
4) Irrigation and wetland return flows are responsible for some of the observed water quality problems but certainly not all of them. The timing of conductivity increases downstream on the river seems to implicate return flows as sources of higher conductivity water. Return flows are also implicated as a potential source of nutrients to the river. Concentrations of total N, total P, and BOD are higher and DO concentrations are lower in return flows. However, river conductivity and concentrations of total N, total P, and BOD are low in the river and overall, there does not appear to be an issue with respect to these constituents.

Water Resources Branch Monitoring Sites

WRB has developed this Water Quality Monitoring Plan for the refuge, giving consideration to both the major water quantity and quality concerns identified in the study above and the availability of time and resources for monitoring. It is not feasible for WRB to continue the same level of monitoring as conducted during the 2-year study; the resources to support this level of effort don't exist. The refuge is a 6-hour drive from the Service's regional office in Portland and WRB struggles to maintain bi-monthly visits for monitoring. Refuge staff are not available for any long-term monitoring effort either.

The 2-year study identified water temperature and dissolved oxygen as the two most critical water quality concerns in the river and also demonstrated the link between river flows and water temperatures. Improving water temperature in the river will lead to improved dissolved oxygen. Both of these parameters can be addressed through management of summer baseflows and diversions and the restoration of riparian vegetation along the channel. The refuge has been actively restoring stream channel and riparian conditions in the Blitzen and manages surface water diversions to maintain a balance between irrigation for waterfowl habitat and instream flows for fish and other aquatic species.

The following plan focuses on streamflow, water temperature, and air temperature monitoring. It describes the monitoring effort maintained by WRB in the Blitzen River and its tributaries.

Flow Monitoring

In 1996, the Service developed a water measurement plan in compliance with Oregon Revised Statute 537.099, which requires government agencies holding water rights in Oregon to report annual water use. Under the plan, the Service measures and reports stream discharge at two sites on the mainstem of the Blitzen River (Blitzen River at Page Springs and Blitzen River at Sodhouse Dam) and four sites on major tributaries and inflows to the Blitzen (McCoy Creek, Krumbo Reservoir outflow, Sodhouse

Spring Pond outflow and Bridge Creek) (Figure 2). The plan was approved by the OWRD and is referenced in the conditions in permit 54164. Specifically the permit condition says:

> *The permittee shall implement the provisions concerning measurement and reporting of flows contained in the existing measurement and reporting plan developed by the permittee and approved by the OWRD. This plan is titled "Water Measuring Plan for Malheur National Wildlife Refuge in Compliance with ORS 537.099: Water Use Reporting for Government Entities," September, 1996.*

WRB continues to uphold its monitoring commitments under the plan. Streamflow data are used for water use reporting in compliance with water right permit requirements and for resource management. Water levels at all sites are monitored continuously at hourly intervals. Hourly water level is converted to hourly streamflow using theoretical rating curves for sites with artificial control structures like flume and weirs or independent rating curves developed and maintained for the site by WRB for sites with natural controls. Sites are visited by WRB staff about every two months to collect independent flow measurements and ensure the loggers and gaging stations are functioning properly and accurately. Data are stored in WRB's WISKI database. Water use and diversion data are reported to the Oregon Water Resources Department annually, as required by permit. For more information on measurement methods and protocols at these sites, see the Water Measuring Plan for Malheur National Wildlife Refuge (USFWS, 1996).

WRB maintains staff gages and rating curves at three other monitoring sites on the mainstem Blitzen and two additional sites on tributaries: one site at the mouth of McCoy Creek and one site at the mouth of Bridge Creek (Figure 2). The purpose of these sites is to ensure that the interim bypass flows identified in the conditions for permit 54164 are maintained throughout the refuge, as required by the permit.

In addition to these monitoring sites, WRB currently funds USGS to monitor streamflow and water temperature continuously on the mainstem Blitzen River at USGS 10396000 DONNER UND BLITZEN RIVER NR FRENCHGLEN OR, which is located on the Blitzen River upstream of the refuge boundary. Streamflow has been monitored continuously at this site since water year 1938. Stream temperature has been monitored continuously at this site since water year 2011. All data are available from the USGS's NWIS website: http://waterdata.usgs.gov/or/nwis/uv?10396000. The data from this site are used by WRB to help report water use on the refuge. Data from the site are also used by the refuge to help manage water supplies, diversions, and river flows. There is no regulation or diversion upstream of this gage and the site provides an excellent record of the hydrologic response to natural climate variability and anthropogenic climate change.

Temperature Monitoring

WRB conducted water temperature monitoring seasonally on the refuge for several years from 2002 to 2005. An OSU graduate student monitored water temperatures continuously in 2007 and 2008

and WRB has these data as well. In 2011, WRB established permanent temperature monitoring sites and monitoring was initiated year-round. Additional sites were added in 2012.

WRB currently monitors 13 different sites for water temperature and one site for air temperature on or near the refuge. We follow the guidelines developed for stream monitoring by Dunham et al. (2005). Temperature monitoring sites include three springs (Sodhouse Spring, Page Springs, and Barnyard Spring), four sites on the mainstem of the Blitzen River, and five sites on major tributaries that flow into the Blitzen, either on or off the refuge (Figure 2). In addition, water temperature is also monitored at the USGS streamflow gage on the Blitzen, as stated above.

All water temperature loggers are Onset Tidbit V2 submersible loggers. The manufacturer's reported accuracy of the loggers is ± 0.2°C at 25°C. The reported range is -20°C to 30°C in water. One Hobo U23 Pro v2 is deployed in a solar radiation shield to monitor air temperature and relative humidity. The reported accuracy of this sensor is ± 0.21 C° from 0°C to 50°C and ± 2.5% from 10% to 90% relative humidity. The loggers cannot be calibrated by the user but they can be checked to see if they are recording within the specified range of accuracy. WRB tests each logger at two different water temperatures before deployment (near room temperature and near freezing). For the room temperature test, water is added to an insulated cooler and stirred until it approximates room air temperature. All loggers are submerged in the cooler for 15 minutes and then programmed to measure water temperatures every minute. The water temperature in the cooler is also measured every minute independently using a NIST thermometer. The water is stirred for 10-15 seconds prior to every reading. Measurements are recorded concurrently with the NIST thermometer and the dataloggers for 15 minutes total. The average of the 15 minute NIST temperature measurements is calculated and compared to the averages from all the dataloggers for the same 15-minute period.

A second test is conducted under near-freezing conditions. For the second test, crushed ice is added to the cooler and stirred continuously for 15 minutes, causing the water temperature to drop to about 0 C°. The dataloggers are submerged and after a 15-minute waiting period, measurements are collected every minute for 15 minutes by the dataloggers and the NIST thermometer. The average of the 15 minute NIST temperature measurements is calculated and compared to the averages from all the dataloggers. Any logger with an average that fails to read within the specified range of accuracy for either of the two tests is rejected and not used.

In the field, the loggers are deployed in flow-through housing constructed of perforated PVC which is cabled to trees, roots, logs, or boulders at each of 13 sites (see Figure 2). The housing secures the dataloggers and also protects the dataloggers from direct solar radiation, which may affect temperature readings (Dunham, 2005). Loggers are deployed in duplicate at most sites, in case one fails. Loggers are programmed to read temperature at hourly intervals. All the sites are visited by WRB staff at least annually, to download data, to collect independent temperature measurements, and to ensure that the loggers are still there and functioning properly. Given the remote location of the refuge and the temperature monitoring sites, it is difficult for WRB to visit more frequently than once a year. An independent temperature reading is collected using the NIST thermometer at the time of the download

to compare readings and ensure that the loggers continue to read accurately. All data are stored in WRB's WISKI database and in separate electronic files.

Data Analyses

Streamflow, water and air temperature data will be compiled and analyzed every five years. WRB proposes to submit a monitoring report to OWRD and ODFW with the results, summarizing water temperatures patterns temporally and spatially across the landscape. Statistical relationships with air temperature and streamflow will be developed at sites on the refuge, where air temperature and streamflow data are available.

References

Dunham, J., G. Chandler, B. Rieman, D. Martin. 2005. Measuring Stream Temperature with Digital Loggers: A User's Guide. Rocky Mounting Research Station, U.S. Forest Service, General Technical Report RMRS-GTR-150WWW.

Mayer, T., K. Janssen, R. Roy, and T. Hallock et al. 2006. Assessment of Degraded Water Quality Effects Associated with Habitat and Water Management of Wetlands and Meadows at Malheur National Wildlife Refuge. Unpublished Report. U.S. Fish and Wildlife Service, Portland OR. 131pp.

Rodnick, K.J., A.K. Gamperl, K.R. Lizars, M.T. Bennett, R.N. Rausch, and E.R. Keeley. 2004. Thermal tolerance and metabolic physiology among redband trout populations in south-east Oregon. Journal of Fish Biology 64, 310-335.

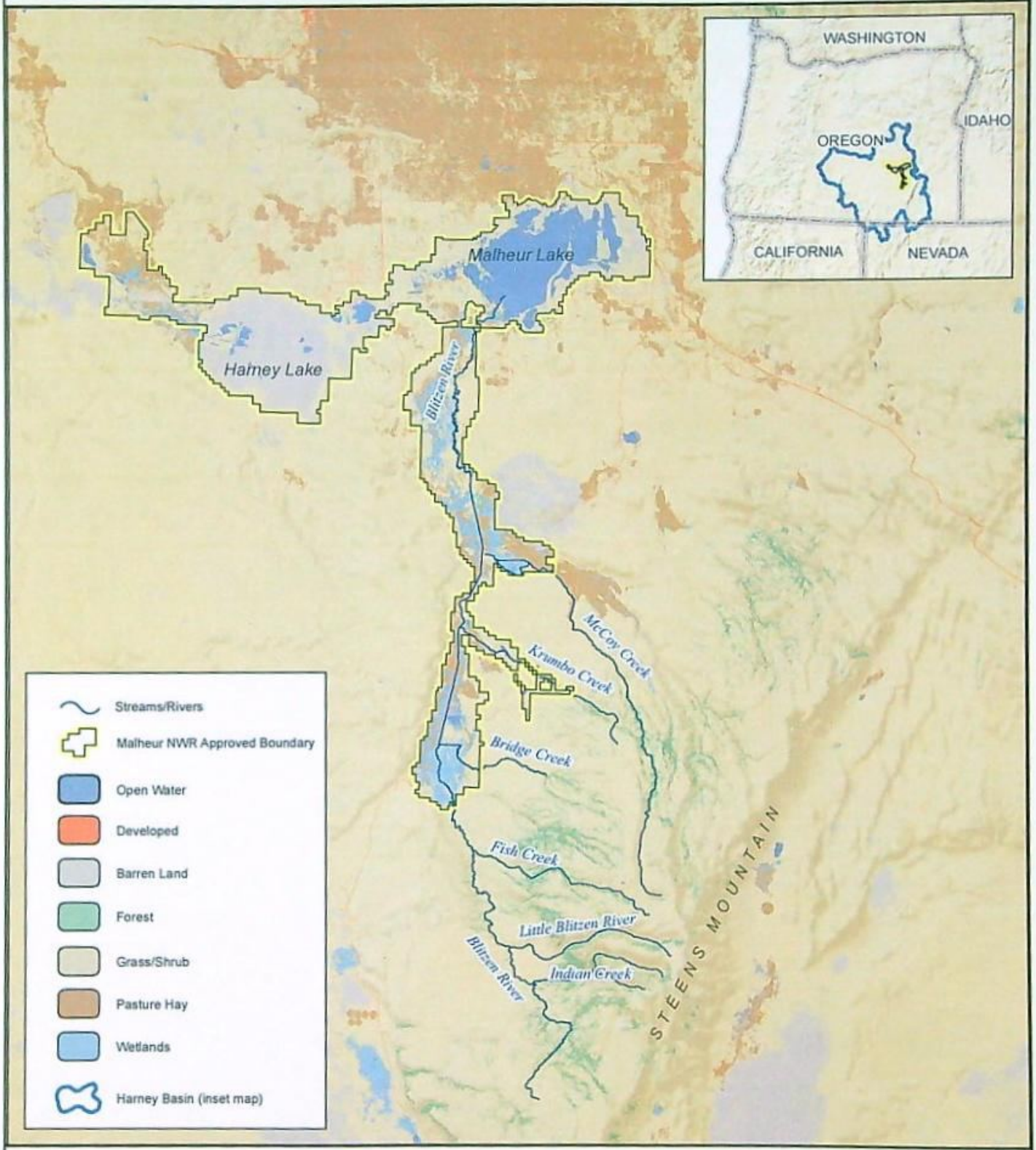
U.S. Fish and Wildlife Service. 1996. Water Measuring Plan for Malheur National Wildlife Refuge. Division of Engineering, Region One, U.S. Fish and Wildlife Service, Portland, OR. 23pp.

U.S. Fish and Wildlife Service. 2000. Status Review for Great Basin Redband Trout. Fish and Wildlife Service, Portland, OR. 82pp.

U.S. Fish & Wildlife Service

Figure 1

Malheur National Wildlife Refuge - Regional Context



Map Projection: NAD_1983_UTM_Zone_11N
Map File: Regional_Overview.mxd
Map Date: Dec. 6, 2013

0 5 10 20 30 40 50 Kilometers

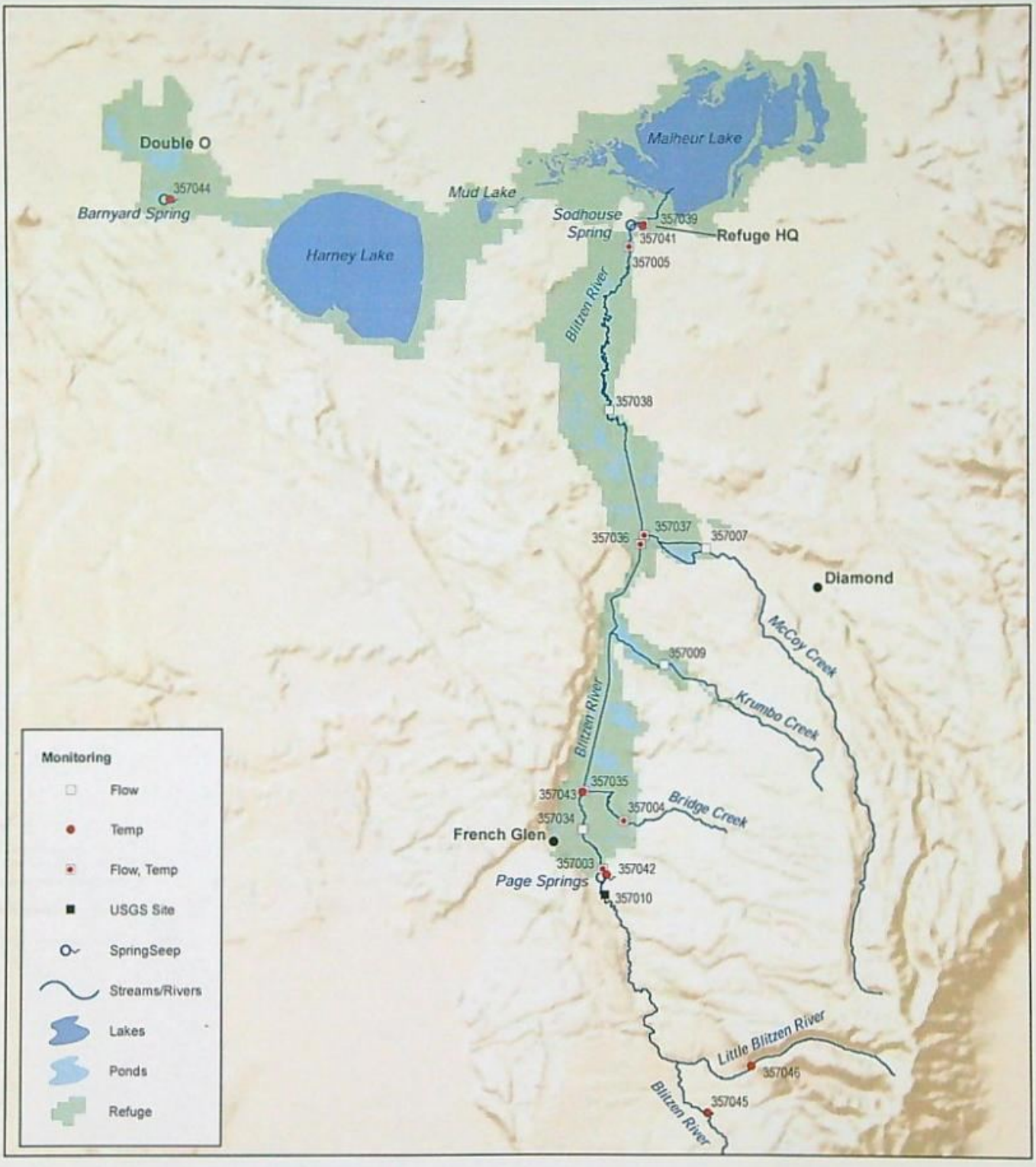
0 2.75 5.5 11 16.5 22 27.5 Miles

Data Sources: Landcover - USGS 2006 National Landcover Dataset; Refuge Boundary - FWS R1 Cadastral Database; Basin - USGS NHD; Basemap - USGS National Map Shaded Relief

U.S. Fish & Wildlife Service

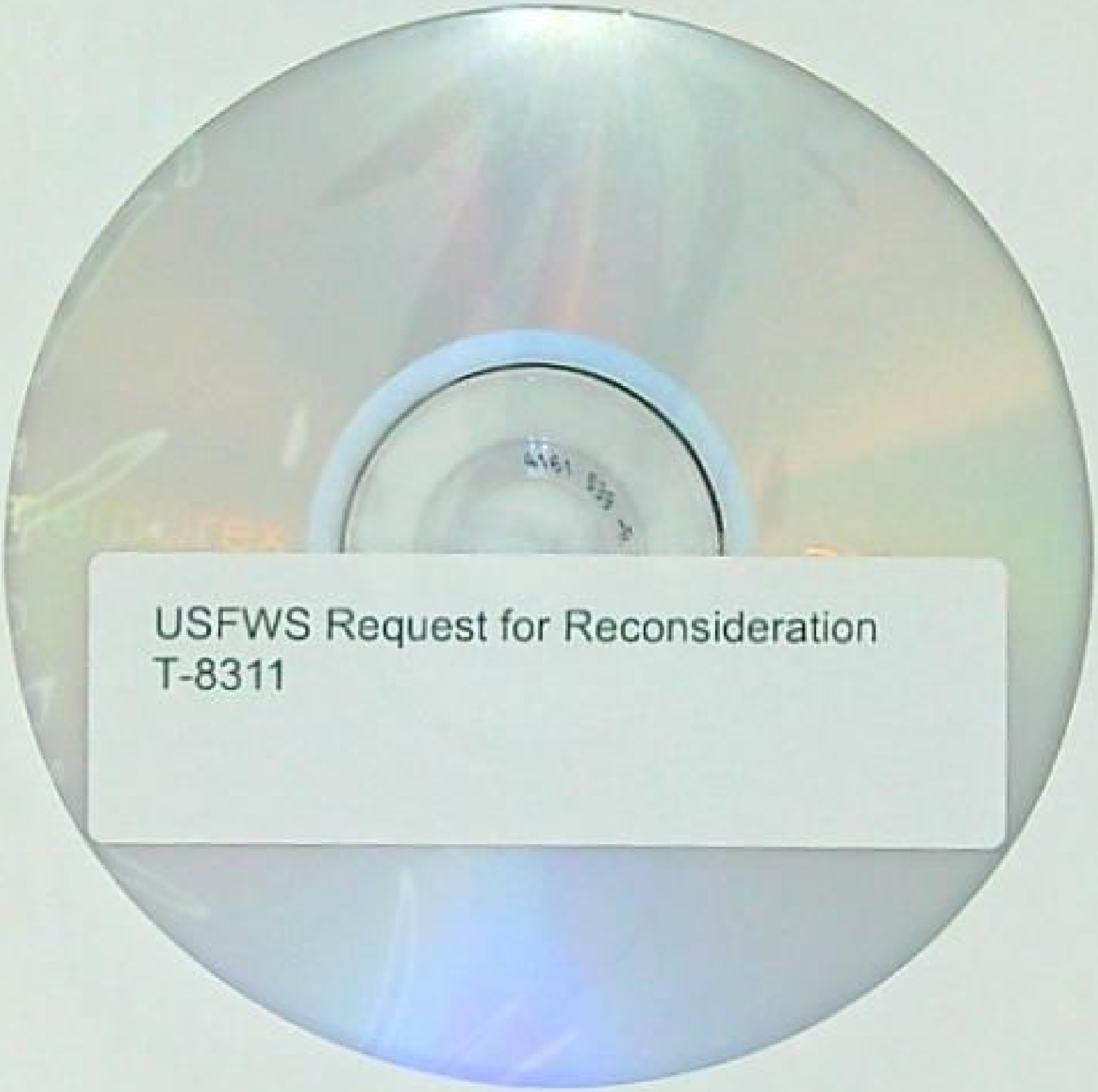
Figure 2

Malheur National Wildlife Refuge - Water Quality Monitoring Sites



Map Projection: NAD_1983_UTM_Zone_11N
Map File: Water_Mgmt_Plan_Monitoring_Sites.mxd
Map Date: Dec. 11, 2013

Data Sources: Hydrography - USGS 1:24,000 NHD; Lakes/Ponds: FWS R1 RIB; Monitoring Locations - FWS R1 WRB; Shaded Relief - USGS


USFWS Request for Reconsideration
T-8311

Oregon
Kate Brown, Governor

Water Resources Department
North Mall Office Building
725 Summer St NE, Suite A
Salem, OR 97301
Phone (503) 986-0900
Fax (503) 986-0904
www.Oregon.gov/OWRD

January 23, 2019

U.S. FISH & WILDLIFE SERVICE
911 NE 11TH AVE.
PORTLAND, OR 97232

REFERENCE: Transfer Application T-8311

Enclosed is a copy of the final order approving your water right transfer application.

The time allowed to complete the transfer is specified in the final order. YOU SHOULD GIVE PARTICULAR ATTENTION TO THE TIME LIMIT. The water right for any portion of the authorized change in character of use or change in place of use NOT carried out within the time allowed will be lost.

An extension of the time limit can be allowed only upon a showing that diligent effort has been made to complete the actual change(s) within the time allowed.

You are required to hire a Certified Water Rights Examiner (CWRE) to complete a Claim of Beneficial Use report and map which must be submitted to this Department within one year of the date you complete the change(s) or within one year of the completion date authorized in the transfer final order, whichever occurs first.

If you have any questions related to the approval of this transfer, you may contact your caseworker, Kelly Starnes, by telephone at (503) 986-0886 or by e-mail at Patrick.K.Starnes@oregon.gov.

Sincerely,

Stacy H. Phillips

Stacy H. Phillips
Water Right Services Support
Transfers and Conservation Section

cc: J R. Johnson, Watermaster Dist. #10 (via email)
Gary Ball, U.S. Fish and Wildlife Service
Hammond Ranches, Inc.
Frank S. Wilson
Laura Schroeder, Schroeder Law Offices PC
Harney Soil & Water Conservation District
Renee Moulun, DOJ
Andy Dunbar
East Region Manager, OWRD

Enclosure

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OREGON

In the Matter of Transfer Application T-8311, Harney County	)	FINAL ORDER APPROVING CHANGES IN POINTS OF DIVERSION, PLACE OF USE AND CHARACTER OF USE

Authority

Oregon Revised Statutes (ORS) 540.505 to 540.580 establish the process in which a water right holder may submit a request to transfer the point of diversion, place of use, or character of use authorized under an existing water right. Oregon Administrative Rules (OAR) Chapter 690, Division 380 implement the statutes and provides the Department's procedures and criteria for evaluating transfer applications.

Applicant:

U.S. FISH AND WILDLIFE SERVICE
911 NE 11th AVENUE
PORTLAND, OREGON 97232-4181

The right to be modified was confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a PORTION of Certificate 15197. The decree is recorded in the Order Record of the Water Resources Director in Volume 13, at Page 508. The date of priority is 1885.

The right allows the use of the DONNER UND BLITZEN RIVER and its tributaries, a tributary of MALHEUR LAKE, for Irrigation of 83.4 acres, Domestic and Stock. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 2.08 cubic feet per second (cfs) prior to June 15, and 1.04 cfs after June 15, if available at the authorized points of diversion: DUNN DAM – NW1/4 SE1/4, SECTION 15, T 27 S, R 31 E, WM, or its equivalent in case of rotation, measured at the point of diversion from the source.

The amount of water used for irrigation, together with the amount secured under any other right for the same lands, is limited to ONE-FORTIETH of one cubic foot per second per acre prior to June 15, and ONE-EIGHTIETH of one cubic foot per second per acre after June 15, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year.

The authorized place of use is located as follows:

Township	S	Range	E	Section	Q-Q	Acres
27	S	31	E	15	NE SE	23.8
27	S	31	E	15	NW SE	33.7
27	S	31	E	15	SW SE	23.9

27	S	31	E	15	SE SE	2.0

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in the decree.

The applicant proposes to change the use to WILDLIFE REFUGE MANAGEMENT including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic irrigation, stock, recreation, construction, and dust control.

The applicant proposed to change the place of use to:

Township		Range			Section	Q-Q	Gov Lot
26	S	31	E	WM	34	NWSW	
26	S	31	E	WM	34	SWSW	
27	S	30	E	WM	25	SENE	
27	S	30	E	WM	25	NESE	
27	S	30	E	WM	25	NWSE	
27	S	30	E	WM	25	SWSE	
27	S	30	E	WM	25	SESE	
27	S	30	E	WM	36	NENE	
27	S	30	E	WM	36	NWNE	
27	S	30	E	WM	36	SWNE	
27	S	30	E	WM	36	SENE	
27	S	31	E	WM	2	NENW	
27	S	31	E	WM	2	NWNW	
27	S	31	E	WM	2	SWNW	
27	S	31	E	WM	2	NWSW	
27	S	31	E	WM	2	SWSW	
27	S	31	E	WM	3	NENE	1
27	S	31	E	WM	3	NWNE	2
27	S	31	E	WM	3	SWNE	
27	S	31	E	WM	3	SENE	
27	S	31	E	WM	3	NENW	3
27	S	31	E	WM	3	NWNW	4
27	S	31	E	WM	3	SWNW	
27	S	31	E	WM	3	SENW	
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31	S	32.5	E	WM	21	SWSE	
31	S	32.5	E	WM	21	SESE	
31	S	32.5	E	WM	28	NWNE	
31	S	32.5	E	WM	28	SWNE	
31	S	32.5	E	WM	28	NENW	
31	S	32.5	E	WM	28	NWNW	
31	S	32.5	E	WM	28	SWNW	
31	S	32.5	E	WM	28	SENW	
31	S	32.5	E	WM	28	NESW	
31	S	32.5	E	WM	28	NWSW	
31	S	32.5	E	WM	28	SWSW	
31	S	32.5	E	WM	28	SESW	
31	S	32.5	E	WM	28	NWSE	
31	S	32.5	E	WM	28	SWSE	
31	S	32.5	E	WM	29	NENE	
31	S	32.5	E	WM	29	NWNE	
31	S	32.5	E	WM	29	SWNE	
31	S	32.5	E	WM	29	SENE	
31	S	32.5	E	WM	29	NENW	
31	S	32.5	E	WM	29	NWNW	
31	S	32.5	E	WM	29	SWNW	
31	S	32.5	E	WM	29	SENW	
31	S	32.5	E	WM	29	NESW	
31	S	32.5	E	WM	29	NWSW	
31	S	32.5	E	WM	29	SWSW	
31	S	32.5	E	WM	29	SESW	
31	S	32.5	E	WM	29	NESE	
31	S	32.5	E	WM	29	NWSE	
31	S	32.5	E	WM	29	SWSE	

31	S	32.5	E	WM	29	SESE	
31	S	32.5	E	WM	30	NENE	
31	S	32.5	E	WM	30	NWNE	
31	S	32.5	E	WM	30	SWNE	
31	S	32.5	E	WM	30	SENE	
31	S	32.5	E	WM	30	NENW	
31	S	32.5	E	WM	30	NWNW	1
31	S	32.5	E	WM	30	SWNW	2
31	S	32.5	E	WM	30	SENW	
31	S	32.5	E	WM	30	NESW	
31	S	32.5	E	WM	30	NWSW	3
31	S	32.5	E	WM	30	SWSW	4
31	S	32.5	E	WM	30	SESW	
31	S	32.5	E	WM	30	NESE	
31	S	32.5	E	WM	30	NWSE	
31	S	32.5	E	WM	30	SWSE	
31	S	32.5	E	WM	30	SESE	
31	S	32.5	E	WM	31	NENE	
31	S	32.5	E	WM	31	NWNE	
31	S	32.5	E	WM	31	SWNE	
31	S	32.5	E	WM	31	SENE	
31	S	32.5	E	WM	31	NENW	
31	S	32.5	E	WM	31	NWNW	1
31	S	32.5	E	WM	31	SWNW	2
31	S	32.5	E	WM	31	SENW	
31	S	32.5	E	WM	31	NESW	
31	S	32.5	E	WM	31	NWSW	3
31	S	32.5	E	WM	31	SWSW	4
31	S	32.5	E	WM	31	SESW	
31	S	32.5	E	WM	31	NESE	
31	S	32.5	E	WM	31	NWSE	
31	S	32.5	E	WM	31	SWSE	
31	S	32.5	E	WM	31	SESE	
31	S	32.5	E	WM	32	NENE	
31	S	32.5	E	WM	32	NWNE	
31	S	32.5	E	WM	32	SWNE	
31	S	32.5	E	WM	32	SENE	
31	S	32.5	E	WM	32	NENW	
31	S	32.5	E	WM	32	NWNW	
31	S	32.5	E	WM	32	SWNW	
31	S	32.5	E	WM	32	SENW	
31	S	32.5	E	WM	32	NESW	
31	S	32.5	E	WM	32	NWSW	
31	S	32.5	E	WM	32	SWSW	
31	S	32.5	E	WM	32	SESW	

31	S	32.5	E	WM	32	NESE	
31	S	32.5	E	WM	32	NWSE	
31	S	32.5	E	WM	32	SWSE	
31	S	32.5	E	WM	32	SESE	
31	S	32.5	E	WM	33	NWNE	
31	S	32.5	E	WM	33	SWNE	
31	S	32.5	E	WM	33	NENW	
31	S	32.5	E	WM	33	NWNW	
31	S	32.5	E	WM	33	SWNW	
31	S	32.5	E	WM	33	SENW	
31	S	32.5	E	WM	33	NESW	
31	S	32.5	E	WM	33	NWSW	
31	S	32.5	E	WM	33	SWSW	
31	S	32.5	E	WM	33	SESW	
31	S	32.5	E	WM	33	NWSE	
31	S	32.5	E	WM	33	SWSE	
32	S	32	E	WM	1	NENE	1
32	S	32	E	WM	1	NWNE	2
32	S	32	E	WM	1	SWNE	
32	S	32	E	WM	1	SENE	
32	S	32	E	WM	1	NENW	3
32	S	32	E	WM	1	NWNW	4
32	S	32	E	WM	1	SWNW	
32	S	32	E	WM	1	SENW	
32	S	32	E	WM	1	NESW	
32	S	32	E	WM	1	NWSW	
32	S	32	E	WM	1	SWSW	
32	S	32	E	WM	1	SESW	
32	S	32	E	WM	1	NESE	
32	S	32	E	WM	1	NWSE	
32	S	32	E	WM	1	SWSE	
32	S	32	E	WM	1	SESE	
32	S	32	E	WM	2	NENE	1
32	S	32	E	WM	2	NWNE	2
32	S	32	E	WM	2	SWNE	
32	S	32	E	WM	2	SENE	
32	S	32	E	WM	2	NESE	
32	S	32	E	WM	2	SESE	
32	S	32	E	WM	11	NENE	
32	S	32	E	WM	11	NWNE	
32	S	32	E	WM	11	SENE	
32	S	32	E	WM	12	NENE	
32	S	32	E	WM	12	NWNE	
32	S	32	E	WM	12	SWNE	
32	S	32	E	WM	12	SENE	

32	S	32	E	WM	12	NENW	
32	S	32	E	WM	12	NWNW	
32	S	32	E	WM	12	SWNW	
32	S	32	E	WM	12	SENW	
32	S	32	E	WM	12	NESE	
32	S	32	E	WM	12	NWSE	
32	S	32.5	E	WM	4	NWNE	2
32	S	32.5	E	WM	4	SWNE	
32	S	32.5	E	WM	4	NENW	3
32	S	32.5	E	WM	4	NWNW	4
32	S	32.5	E	WM	4	SWNW	
32	S	32.5	E	WM	4	SENW	
32	S	32.5	E	WM	4	NESW	
32	S	32.5	E	WM	4	NWSW	
32	S	32.5	E	WM	4	NWSE	
32	S	32.5	E	WM	5	NENE	1
32	S	32.5	E	WM	5	NWNE	2
32	S	32.5	E	WM	5	SWNE	
32	S	32.5	E	WM	5	SENE	
32	S	32.5	E	WM	5	NENW	3
32	S	32.5	E	WM	5	NWNW	4
32	S	32.5	E	WM	5	SWNW	
32	S	32.5	E	WM	5	SENW	
32	S	32.5	E	WM	5	NESW	
32	S	32.5	E	WM	5	NWSW	
32	S	32.5	E	WM	5	SWSW	
32	S	32.5	E	WM	5	SESW	
32	S	32.5	E	WM	5	NESE	
32	S	32.5	E	WM	5	NWSE	
32	S	32.5	E	WM	5	SWSE	
32	S	32.5	E	WM	6	NENE	1
32	S	32.5	E	WM	6	NWNE	2
32	S	32.5	E	WM	6	SWNE	
32	S	32.5	E	WM	6	SENE	
32	S	32.5	E	WM	6	NENW	3
32	S	32.5	E	WM	6	NWNW	4
32	S	32.5	E	WM	6	SWNW	5
32	S	32.5	E	WM	6	SENW	
32	S	32.5	E	WM	6	NESW	
32	S	32.5	E	WM	6	NWSW	6
32	S	32.5	E	WM	6	SWSW	7
32	S	32.5	E	WM	6	SESW	
32	S	32.5	E	WM	6	NESE	
32	S	32.5	E	WM	6	NWSE	
32	S	32.5	E	WM	6	SWSE	

32	S	32.5	E	WM	6	SESE	
32	S	32.5	E	WM	7	NENE	
32	S	32.5	E	WM	7	NWNE	
32	S	32.5	E	WM	7	SWNE	
32	S	32.5	E	WM	7	SENE	
32	S	32.5	E	WM	7	NENW	
32	S	32.5	E	WM	7	NWNW	1
32	S	32.5	E	WM	7	SWNW	2
32	S	32.5	E	WM	7	SENW	
32	S	32.5	E	WM	7	NESW	
32	S	32.5	E	WM	7	NWSW	3
32	S	32.5	E	WM	7	NESE	
32	S	32.5	E	WM	7	NWSE	
32	S	32.5	E	WM	8	NWNE	
32	S	32.5	E	WM	8	NENW	
32	S	32.5	E	WM	8	NWNW	
32	S	32.5	E	WM	8	SWNW	
32	S	32.5	E	WM	8	NWSW	
32	S	32.5	E	WM	8	SWSW	

The applicant proposed to add the following additional points of diversion:

NEW BUCKAROO DAM – SW ¼ NW ¼, Section 6, Township 32 South, Range 32.5 East, W.M.; 1356 FEET SOUTH AND 381 FEET EAST FROM NW CORNER, SECTION 6;

OLD BUCKAROO DAM – SW ¼ SW ¼, Section 31, Township 31 South, Range 32.5 East, W.M.; 602 FEET NORTH AND 50 FEET EAST FROM SW CORNER, SECTION 31;

BRIDGE CREEK/EASTSIDE CANAL DIVERSION – NW ¼ NE ¼, Section 32, Township 31 South, Range 32.5 East, W.M.; 852 FEET SOUTH AND 1796 FEET WEST FROM NE CORNER, SECTION 32;

KIGER CREEK DIVERSION – NW ¼ NE ¼, Section 21, Township 29 South, Range 32 East, W.M.; 98 FEET SOUTH AND 1340 FEET WEST FROM NE CORNER, SECTION 21;

McCOY CREEK STRUCTURE – SW ¼ NW ¼, Section 21, Township 29 South, Range 32 East, W.M.; 2260 FEET SOUTH AND 960 FEET EAST FROM NW CORNER, SECTION 21;

KRUMBO POND DIKE – NW ¼ NE ¼, Section 24, Township 30 South, Range 31 East, W.M.; 635 FEET SOUTH AND 1779 FEET WEST FROM NE CORNER, SECTION 24;

KRUMBO RESERVOIR DAM – NE ¼ NW ¼, SECTION 19, Township 30 South, Range 32 East, W.M.; 1082 FEET SOUTH AND 1976 FEET EAST FROM THE NW CORNER, SECTION 19;

SODHOUSE DAM – SE ¼ SE ¼, Section 3, Township 27 South, Range 31 East, W.M.; 856 FEET NORTH AND 4 FEET WEST FROM SE CORNER, SECTION 3;

GRAIN CAMP DAM – NE ¼ NE ¼, Section 26, Township 29 South, Range 31 East, W.M. 859 FEET SOUTH AND 527 FEET WEST FROM NE CORNER, SECTION 26;

BUSSE DAM – NW ¼ NE ¼, Section 22, Township 28 South, Range 31 East, W.M. 906 FEET SOUTH AND 2094 FEET WEST FROM NE CORNER, SECTION 22;

BLITZEN CANAL – SE ¼, SE ¼, Section 24, Township 31 South, Range 32 East, W.M. 51 FEET NORTH AND 69 FEET WEST FROM THE SE CORNER, SECTION 24;

DIAMOND CANAL – NE ¼, Section 25, Township 29, South, Range 32 East, W.M.;

END OF BLITZEN CANAL – NW ¼ NW ¼, Section 35, Township 28 South, Range 31 East, 189 FEET SOUTH AND 978 FEET EAST FROM THE NW CORNER, SECTION 35;

BRIDGE CREEK DIVERSION – NW ¼, NE ¼, Section 29, Township 31 South, Range 32.5 East, W.M.; 87 FEET SOUTH AND 2474 FEET WEST FROM THE NE CORNER, SECTION 29;

THESE CHANGES TO AN EXISTING WATER RIGHT ARE APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. The quantity of water diverted at the new points of diversion, together with that diverted at the old points of diversion, shall not exceed the quantity of water lawfully available at the original points of diversion.

2. The amount of water used for WILDLIFE REFUGE MANAGEMENT is limited to 2.08 cubic feet per second (cfs) prior to June 15, and 1.04 cfs after June 15, and shall be further limited to a diversion of not to exceed 250.2 acre feet during the irrigation season from March 15 to October 1 of each year.

3. The water user shall not irrigate or partially irrigate more than 83.4 acres, during the irrigation season, in any year as part of this right.

4. The water user shall install, operate and maintain headgates, in-line flow meters, weirs, or other suitable control devices for measuring and recording the quantity of water diverted. The types and plans of the headgate and measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

5. The water user shall submit and obtain approval of a water use measurement plan and implementation schedule which addresses this use, prior to use of water under this transfer.

6. The water user shall report monthly total flow figures on an annual basis and in addition, when requested by the Watermaster upon reasonable notice. The Watermaster shall monitor the accuracy of the measuring devices, as needed. Accuracy of the measuring devices shall be within $\pm$15% of actual.

7. The water user shall allow the Watermaster access to all control and measuring devices and all points of diversion upon reasonable notice.

8. Water shall be acquired from the same surface water sources as the original points of diversion.

9. The water user shall provide annual written notice to the Watermaster indicating the number and location of acres to be irrigated. USFWS shall not use a split-irrigation duty for irrigation sub-use. When the USFWS designates the acreage, annually, that will be irrigated, the use of the full irrigation duty at 3 acre-feet per acre will be assumed. Any of the 250.2 acre-feet remaining of the annual allotment then may be used for other sub-uses on the Refuge.

10. The U.S. Fish and Wildlife Service shall provide copies of any water management plans developed for the use of water for the Malheur National Wildlife Refuge to the local Watermaster.

11. Certificate 15197 is canceled. A new certificate will be issued to confirm that portion of the right NOT involved in this transfer. When satisfactory proof of the completed change is received, a new certificate confirming this water right will be issued.

12. Full beneficial use of the water shall be made, consistent with the terms of this order, on or before October 1, 2019. A Claim of Beneficial Use prepared by a Certified Water Right Examiner shall be submitted by the applicant to the Department within one year after the deadline for completion of the changes and full beneficial use of the water.

Dated at Salem, Oregon this 23rd day of January, 2019.

Dwight French, Water Right Services Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

Appeal Rights
ORS 536.075(2) and ORS 183.482 allow for appeal of final orders in contested cases. This is a final order in a contested case. This order is subject to judicial review under ORS 183.482. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.482. Pursuant to ORS 536.075 and OAR 137-003-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

CERTIFICATE OF SERVICE

I hereby certify that on January 29, 2019, I served a full, true and correct copy of the above FINAL ORDER APPROVING CHANGES IN POINTS OF DIVERSION, PLACE OF USE AND CHARACTER OF USE T-8311 upon the parties hereto as follows by first class mail:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
Portland, OR 97232
Gary_Ball@fws.gov

Dwight and Susan Hammond
Hammond Ranches, Inc.
46911 Hammond Ranch Rd
Diamond, OR 97722

Frank S. Wilson
Office of the Regional Solicitor
601 SW 2nd Ave, Suite 1950
Portland, OR 97204
frank.wilson@sol.doi.gov

Laura Schroeder
Schroeder Law Offices PC
1915 NE Cesar E. Chavez Boulevard
Portland, OR 97212

Harney Soil & Water Conservation District
c/o Marty Goold
P.O. Box 848
Hines, Oregon 97738

Renee Moulun
Oregon Department of Justice NR
1162 Court St. NE
Salem, OR 97301-4096

Andy Dunbar
HCR 72 Box 200E
36076 Sodhouse Lane
Princeton, OR 97721

DATED this 23rd day of January, 2019.

Patricia McCarty

Patricia McCarty, Agency Representative,
OREGON WATER RESOURCES DEPARTMENT

Copies to:

Dist 10 Watermaster
East Region Manager
File: T-8311

STATE OF OREGON

COUNTY OF HARNEY

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

W J DUNN
NARROWS, OREGON

confirms the right to use the waters of DONNER UND BLITZEN RIVER , a tributary to MALHEUR LAKE for IRRIGATION, DOMESTIC AND STOCK.

This right was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County. The decree is of record at Salem, in the Order Record of the Water Resources Director in Volume 13, at Pages 508-553. The dates of priority are listed below.

The amount of water used for irrigation is limited to a diversion of ONE-FORTIETH of one cubic foot per second per acre prior to June 15, and ONE-EIGHTIETH of one cubic foot per second per acre after June 15, with a total limitation of 3.0 acre-feet per acre from March 15 to October 1, measured at the points of diversion from the stream.

A description of the place of use to which this right is appurtenant is as follows:

IRRIGATION, DOMESTIC AND STOCK							
Priority Date	Twp	Rng	Mer	Sec	Q-Q	GLot	Acres
1887	26 S	30 E	WM	28	SW SW	1	2.00
1887	26 S	30 E	WM	32	NE NE	1	7.10
1887	26 S	30 E	WM	32	SE NE	2	42.67
1887	26 S	30 E	WM	32	SE NW	7	7.77
1887	26 S	30 E	WM	32	SE SE		40.00
1887	26 S	30 E	WM	33	NW NW	1	24.53
1887	26 S	30 E	WM	33	NW SW	2	33.77
1887	26 S	30 E	WM	33	SW SW	3	34.74
1887	26 S	30 E	WM	33	SE SW	4	12.38
1887	26 S	30 E	WM	33	SW SE	5	14.26
1887	26 S	30 E	WM	33	SE SE	6	33.90
1887	26 S	31 E	WM	32	NE NE		40.00
1887	26 S	31 E	WM	32		1	36.2
1887	26 S	31 E	WM	33	SW NE		40.00
1887	26 S	31 E	WM	33	SE NE		40.00
1887	26 S	31 E	WM	33	NE NW		40.00
1887	26 S	31 E	WM	33	SE NW		40.00
1904	27 S	30 E	WM	4	NW NW	11	39.97
1906	27 S	30 E	WM	3	SW NW	5	42.89
1906	27 S	30 E	WM	3	NW SW	4	37.55
1906	27 S	30 E	WM	4	SE NE		40.00

IRRIGATION, DOMESTIC AND STOCK							
Priority Date	Twp	Rng	Mer	Sec	Q-Q	GLot	Acres
1906	27 S	30 E	WM	4	NE SE	7	20.75
1906	27 S	30 E	WM	4	NE SE	1	19.25
1907	27 S	30 E	WM	4	SW NE		40.00
1907	27 S	30 E	WM	4	SE NW		40.00
1907	27 S	30 E	WM	4	NE SW	5	41.84
1907	27 S	30 E	WM	4	NW SE	6	39.62
1908	26 S	30 E	WM	32	NE SW	6	20.88
1908	26 S	30 E	WM	32	SE SW	5	42.35
1908	26 S	30 E	WM	32	NE SE	3	42.49
1908	26 S	30 E	WM	32	SW SE	4	17.79
1909	27 S	30 E	WM	4	NW NE	9	39.85
1909	27 S	30 E	WM	4	NE NW	10	39.91
1910	27 S	30 E	WM	4	NE NE	8	39.79
1911	27 S	30 E	WM	5	NE NE	1	40.00
1911	27 S	30 E	WM	5	NW NE	2	40.00
						Total	1174.25

This certificate describes that portion of water right Certificate 15197, State Record of Water Right Certificates, NOT modified by the provisions of an order of the Water Resources Director entered JAN 23 2019, approving Transfer Application T-8311.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in said decree.

WITNESS the signature of the Water Resources Director, affixed JAN 23 2019.

Dwight French, Water Right Services Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

Oregon Water Resources Department
Water Right Services Division

In the Matter of the Protests Against Water Transfer Applications T-8309, 8310, 8311, 8312	)	**FINAL ORDER IN CONTESTED CASE**
UNITED STATES FISH AND WILDLIFE SERVICE, *Applicant*	)	
ANDY DUNBAR; WATER FOR LIFE, INC.; HAMMOND RANCHES, INC.; DWIGHT AND SUSAN HAMMOND; HARNEY COUNTY HAYGROWERS ASSOCIATION; JOHN AND DEBBIE VOLLE; HARNEY SOIL & WATER CONSERVATION DISTRICT, *Protestants*	)	

SUMMARY OF THIS ACTION

The Oregon Water Resources Department issues this final order adopting the recommendations made by the Administrative Law Judge (ALJ) in the Proposed Order to resolve the protests filed against Transfer Applications T-8309, T-8310, T-8311, and T-8312. In issuing this final order in contested case, the Department adopts without amendment, the Legal Rulings concerning the Motion for Reconsideration, the Motion to Strike, Issues Presented, and Evidentiary Rulings from the ALJ's Proposed Order. Where modifications are made to the Proposed Order, those modifications are noted as set out below.

HISTORY OF THE CASE

The Oregon Water Resources Department adopts this section of the ALJ's Proposed Order and modifies it only to note the dates of issuance of the Proposed Order and the filing of exceptions to the proposed order by Water for Life, Inc., Hammond Ranches, Inc., Harney County Haygrowers Association, WRD and the USFWS.

On July 28, 1999, the United States Fish and Wildlife Service (USFWS) filed transfer applications T-8309, 8310, 8311 and 8312 with the Oregon Water Resources Department (WRD or Department), proposing to modify water rights evidenced by certificates 28524, 15198, 15197, and 14367 by making changes to the place of use, nature of use and points of diversion. Protests to all four applications were timely filed by protestants Water for Life (representing protestants Water for Life, Harney County Haygrowers Association, Dwight Hammond and Suzi Hammond) (hereafter referred to collectively as Water for Life) and Harney Soil and Water Conservation District (HSWCD); a protest to application T-8309 was timely filed by Andy Dunbar.

The Department initiated a contested case hearing to determine whether the proposed transfers would result in injury to existing water rights. In its Notice of Hearing and Prehearing Conference dated October 9, 2000, the Department phrased the issue for hearing generally as: "Whether the proposed changes as described by the transfer applications would result in injury to existing water rights." The Department moved to limit the hearing issues in this matter and on March 5 and May 3, 2001, orders issued identifying the issues for hearing, with certain issues identified as legal issues to be decided on the basis of written argument prior to hearing. On August 14, 2000, an order issued with rulings on the identified legal issues. A contested case hearing was held in this matter at the Harney County Courthouse, Burns, Oregon on August 23, 24 and 25, 2001. The applicant USFWS appeared through and with Attorney Barbara Scott-Brier. The Department appeared through and with Assistant Attorney General Sharyl Kammerzell. Protestants Water for Life, Hammond Ranches and Harney County Haygrowers Association appeared through and with attorney Brad Harper. Protestant HSWCD appeared through and with Attorney Laura A. Schroeder. Protestant Andy Dunbar appeared on his own behalf. Witnesses Bernadette Williams and Mitch Lewis testified on behalf of the Department. Witnesses Robert Glaeser, Michael Eberle and Tom Downs testified on behalf of USFWS. Witness Senator Ted M. Ferrioli testified on behalf of HSWCD. Witnesses Blake Nuffer, Marvin Jess, Mitch Lewis, Steve Applegate, Andy Dunbar, William (Bill) Neal, Forest Cameron, Dwight Hammond and Steven Hammond testified on behalf of Water for Life.

On June 10, 2002, the Administrative Law Judge (ALJ) issued a Proposed Order to approve the draft transfer orders except for 21.1 acres of land above Krumbo Reservoir.

On July 5, 2002, Protestants Water for Life, Inc., Hammond Ranches, Inc., and Harney County Haygrowers Association timely filed exceptions to the ALJ's proposed order.

On July 10, 2002, WRD timely filed exceptions to the ALJ's proposed order.

On July 22, 2002, USFWS timely filed a response to the exceptions, and on July 24, 2002 it filed a correction to its response.

The record of this proceeding consists of a transcript of the hearing, all evidence received, all documents filed in the contested case, and exceptions and responses to exceptions. The findings of fact and conclusions of law are based upon the entire record.

MOTION FOR RECONSIDERATION OF LEGAL RULINGS

The Department adopts this section of the ALJ's Proposed Order without modification.

Protestant HSWCD requests reconsideration of the rulings on legal issues in this matter. HSWCD retained the services of counsel immediately prior to the hearing. The sole reason given by counsel for reconsideration of the previous rulings on legal issue is HSWCD's retention of counsel. However, HSWCD had ample opportunity to retain counsel in this matter prior to the ruling on legal issues and failed to do so. Notice of this case was made in November 2000, and the hearing date was set by agreement of the parties more than three months prior to hearing. Prior to hearing, the parties identified the preliminary legal issues in this case through prehearing motion and argument and an order issued. I agreed with the Department that the issues remaining for hearing appeared to be of a factual nature. Factual issues are specifically within the scope of an authorized representative's scope of representation. *See* OAR 137-003-0555. HSWCD was capable of making an effective presentation in prehearing motions, even in the absence of counsel. To the extent that legal issues were raised later at hearing, HSWCD had the assistance of counsel and was not prejudiced in any way by the prior rulings. Accordingly, I deny the motion for reconsideration.

MOTION TO STRIKE PORTIONS OF WATER FOR LIFE'S RESPONSE

The Department adopts this section of the ALJ's Proposed Order without modification.

The Department moves to strike those portions of Water for Life's Response to Motion for Reconsideration of Order dated August 14, 2001 that exceed the scope of briefing allowed by this hearing officer. I agree that Water for Life's response went beyond the issues presented in the Motion for Reconsideration. In addition to addressing the issue of whether the August 14, 2001 order on legal issues should be reconsidered, Water for Life addressed legal issues and made closing argument that addressed the record produced at hearing. This additional briefing was non-responsive to the Motion for Reconsideration and I grant the Motion to Strike.

ISSUES PRESENTED

The Department adopts this section of the ALJ's Proposed Order without modification.

The issues in this matter were established through a May 3, 2001 Prehearing Order identifying the issues to be resolved at hearing, and specifying those issues which were legal matters to be decided by written argument prior to hearing and those issues which were factual matters to be decided after hearing. The order identified the factual issues remaining as whether the proposed changes as described by the transfer applications would result in injury to existing water rights considering:

A. Whether the proposed transfer would result in a net loss of water available to downstream water rights.

B. Whether the water rights proposed to be transferred would be enlarged.

C. Whether the original place of use of the proposed water rights to be transferred can be prevented from receiving water from the same source.

D. Whether, due to the proposed transfers, there may be a change in the quantity of water previously available to another water right and to which the other water right is entitled.

EVIDENTIARY RULINGS

The Department adopts this section of the ALJ's Proposed Order without modification.

WRD Exhibits 1-14 were admitted by stipulation of the parties.

USFWS Exhibits 1-5 were admitted by stipulation of the parties; USFWS 7-A, 12-A, 13-A, 14-A, 15-A, 16-A, 17-A, 19A, 20-A, 21-A, 25-A, 26-A, 27-A, 28-A, 29-A, 31-A, 37-A, 40-A, 58-A, 59-A, 61-A, and 62-A were received without objection.

Water for Life Exhibits, B, C, D, F, I, J, K, M, N, O, Q and R were admitted by stipulation of the parties. Water for Life Exhibit E was admitted after redaction of all handwritten portions. Water for Life Exhibit A, page 1, was admitted without objection.

Dunbar Exhibits 1 and 2 were admitted without objection.

The parties stipulate that the hearing officer may take judicial notice of the Decree for the Donner und Blitzen River.

The request of Andy Dunbar to call Jim Graham, a hydrologist, as an expert witness was denied on the grounds that he was not named as a witness within the deadlines established at prehearing conference for the presentation of witness lists. A letter memorandum from James Graham was accepted into the record as an offer of proof. *See* Water for Life Offer of Proof-1.

WRD moved to quash the subpoena for testimony by Paul Cleary, Director of the Water Resources Department. The motion was made on the grounds that Mr. Cleary was being called to testify in his role as an agency decision maker, as opposed to factual inquiry into relevant matters in dispute. *See Citizens to Preserve Overton Park v. Volpe,* 401 US 402, 422, 9 S Ct 814, 28 L Ed2d 136 (1971). I concluded that the intended line of inquiry was relevant only to the decision making processes of the witness, and with no showing that the director's decision making process was properly in dispute, the subpoena was quashed.

USFWS stipulates that it did not intend for its water right transfers, T-8309 through T- 8312, to create a split irrigation duty for the irrigation sub-use of its wildlife Refuge management use of the water. USFWS further stipulates to inclusion in the transfer orders a condition precluding a split-irrigation duty for USFWS irrigation sub-use. When the USFWS designates the acreage, annually, that will be irrigated, the Service's use of the full irrigation duty at three acre feet per acre for the irrigated acres will be assumed. The volume remaining will be available for other sub-uses under the right.

FINDINGS OF FACT

The Department adopts this section of the ALJ's Proposed Order and amends Finding of Fact No. 7 in response to the Department's Exception No. 1. The Department also amends Finding of Fact No. 9 to provide a tabulation of those acres the ALJ found were not subject to transfer because of non-use.

1. Transfer Application T-8309 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 28524. The dates of priority are 1872 for 16,386.5 acres, 1877 for 1109.6 acres, 1881 for 638.4 acres, 1882 for 73.3 acres, 1883 for 546.3 acres, 1884 for 140.3 acres, 1885 for 2991.4 acres, 1886 for 1102.6 acres, 1887 for 4796.1 acres, 1888 for 839.9 acres, 1889 for 1532.6 acres, 1890 for 952.6 acres, 1891 for 627.5 acres, 1892 for 90.0 acres, 1893 for 227.5 acres, 1897 for 103.8 acres, 1899 for 236.2 acres, 1901 for 37.9 acres, and 1902 for 170.1 acres. The authorized places of use for this right are listed at WRD Exhibit 6, pages 2 through 28 and are hereby adopted by reference.[1] The authorized points of diversion are listed at WRD Exhibit 6, page 2 and are hereby adopted by reference. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 815.0 cubic feet per second (cfs) prior to June 15, and 407.53 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River and its tributaries, a tributary of Malheur Lake, for irrigation of 32,602.7 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 6, pages 28 through 36, which is hereby adopted by reference.[2] USFWS proposes to add nine additional points of diversion - New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, and Dunn Dam. The locations for these points of diversion are listed at WRD Exhibit 6, pages 36 through 37 and are hereby adopted by reference.[3]

2. Transfer Application T-8310 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 15198. The date of priority is 1885. The authorized places of use for this right are listed at WRD Exhibit 7, page 2 and are hereby adopted by reference.[4] The authorized point of diversion is Dunn Dam-NW ¼ SE ¼ , Section 15, T 27 S, R 31 E, WM or its equivalent in case of rotation. The amount of water to which

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[1] There are several hundred places of use for this right. The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 6 at pages 6 through 28.

[2] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 6 at pages 28 through 36.

[3] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 6 at pages 36 through 37.

[4] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 7 at page 2.

this right is entitled is limited to an amount actually beneficially used and not to exceed 2.71 cubic feet per second (cfs) prior to June 15, and 1.36 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River, a tributary of Malheur Lake, for irrigation of 108.4 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 7, pages 2 through 10, which are hereby adopted by reference.[5] USFWS proposes to add 15 additional points of diversion - New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, Page Springs Dam, Grain Camp Dam, Busse Dam, Blitzen Canal, End of Blitzen Canal, Diamond Canal, and Bridge Creek Diversion. The locations for these points of diversion are listed at WRD Exhibit 7, pages 10 through 11 and are hereby adopted by reference.[6]

3. Transfer Application T-8311 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 15197. The date of priority is 1885. The authorized places of use for this right are listed at WRD Exhibit 8, page 2 and are hereby adopted by reference.[7] The authorized point of diversion is Dunn Dam-NW ¼ SE ¼, Section 15, T 27 S, R 31 E, WM or its equivalent in case of rotation. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 2.08 cubic feet per second (cfs) prior to June 15, and 1.04 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River, a tributary of Malheur Lake, for irrigation of 83.4 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 8, pages 2 through 10, which are hereby adopted by reference.[8] USFWS proposes to add 15 additional points of diversion - New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, Dunn Dam, Grain Camp Dam, Busse Dam, Blitzen Canal,

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[5] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 7 at pages 2 through 10.

[6] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 7 at pages 10 through 11.

[7] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 8 at page 2.

[8] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 8 at pages 2 through 10.

End of Blitzen Canal, Diamond Canal, and Bridge Creek Diversion. The locations for these points of diversion are listed at WRD Exhibit 8, pages 10 through 12 and are hereby adopted by reference.[9]

4. Transfer Application T-8312 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 14367. The right was perfected under Permit 11544 with a date of priority of September 30, 1930. The authorized places of use for this right are listed at WRD Exhibit 9, page 2 and are hereby adopted by reference.[10] The authorized point of diversion is SW *Y4* SE 14, Section 20, T3 l S, R 32 E, WM. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 0.28 cubic feet per second. The right allows use of Bridge Creek, a tributary of the Donner und Blitzen for irrigation of 21.4 acres and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 9, pages 2 through 10, which are hereby adopted by reference.[11] USFWS proposes to add seven additional points of diversion – Bridge Creek/Eastside Canal Diversion, Sodhouse Dam, Dunn Dam, Grain Camp Dam, Busse Dam, Blitzen Canal, and End of Blitzen Canal. The locations for these points of diversion are listed at WRD Exhibit 8, pages 10 through 11 and are hereby adopted by reference.[12]

5. The Malheur National Wildlife Refuge (Refuge) is an immense area, covering over 180,000 acres. The Blitzen Valley portion covers over 65,000 acres. The management of water on the Refuge is very complex, and has always been so, even when it was a working ranch. The Refuge's water is managed to meet its primary purpose as a refuge and breeding ground for migratory waterfowl and other wildlife. The Refuge uses its water to provide habitat to migratory birds and other wildlife. The habitat includes grains, grasses, wetland plants (often called emergent vegetation) and small ponds. Some commercial crops are grown on the Refuge but such plantings are integrated in the Refuge's biological planning. Wetland plants provide a number of benefits to waterfowl, including nesting, resting, feeding, and so forth. Ponds are also necessary for wildlife species that need some amount of open water.

6. Andy Dunbar is a rancher, a portion of whose property lies at the north end of the Refuge system where the water from the Donner und Blitzen River feeds into the mouth of Malheur Lake. The main Dunbar property is approximately 400 acres and is surrounded on three sides by Refuge land. Dunbar's main water right is based on Certificate 15198, with a priority date of 1889. He obtains his water from the Sodhouse Dam Diversion on the Donner und Blitzen through what is known as the Bull Ditch, which flows across Refuge Land. The Sodhouse Dam is approximately three quarters of a mile upstream from Dunbar's property line on the Donner und Blitzen River. Dunbar also has a ground water right for approximately 310 acres.

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[9] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 8 at pages 10 through 12.

[10] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. See WRD Ex. 9 at page 2.

[11] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 9 at pages 2 through 10.

[12] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 9 at pages 10 through 11.

7. Dunbar receives water[13] from surface water delivery systems on the Refuge. There was testimony presented from both Dunbar and Beal that if the transfer were approved and the Refuge decided not to irrigate the portions of land near Dunbar's ranch, he would not receive the water he normally gets through the surface water delivery systems that run by his ranch. Additionally, Dunbar testified that he receives subsurface water from irrigation on Refuge property. Dunbar believes that groundwater levels on his property are hydrologically connected to water levels on the Donner und Blitzen River. This belief is supported by measurements taken by Beal, which show a correlation between water levels in the river and in Dunbar's groundwater. All nine additional proposed points of diversion in Draft Final Order T-8309 are upstream from Mr. Dunbar. The applicant, after the transfer, could take all of its water or none of its water from any of the points of diversion, completely bypassing the Sodhouse Dam that Dunbar currently uses as his point of diversion. Neither certificate nor decree indicate a point of diversion for Dunbar at either Sodhouse Dam or even Bull Ditch; Dunbar's authorized point of diversion is the river. The Decree did authorize a property other than Dunbar's to use Bull Ditch as a point of diversion. Water Master Lewis testified that there is no change in water use, and no probable change in water use, that could result in harm to Dunbar.

8. Dwight Hammond is a rancher. The main portion of his ranch, the Hammond Ranches, is surrounded on three sides by Refuge land near Krumbo Reservoir. He has lived at that location since 1983. The Hammond's point of diversion is on Krumbo Creek for water rights junior to the USFWS rights. The Refuge's first point of diversion in Krumbo Creek is four miles downstream from the Hammonds' diversion. USFWS currently has no rights to irrigate the lands above Kern Reservoir (through which the Hammonds irrigate).

9. Dwight Hammond, Steve Hammond and Bill Beal have personally observed that certain tracts above Krumbo Reservoir currently proposed for transfer have neither been irrigated in the last fifteen years, are not currently capable of being irrigated, nor have they been capable of being irrigated for the last 15 years. This water right is located at Township 30 South, Range 32 East, Sections 20 and 29. (Testimony of Bill Beal, Dwight Hammond and Steve Hammond; WRD Ex. 5-6).[14] The excluded acres are set out in the table below.

Priority Date	Township	Range	Section	Qtr/Qtr	Original Request	Authorized to be changed
1883	T30S	R32E	20	NWSW	5.1	0
1883	T30S	R32E	20	SWSW	12.2	0
1891	T30S	R32E	29	NWNW	3.8	0
				Total	21.1	0

[13] This change to Finding of Fact #7 reflects the allowance of the first of WRD's exceptions. *See*, page 19. "Water" has been substituted for "return flows". The change in terminology to describe the water that Mr. Dunbar uses makes the nomenclature consistent with the characterization of the water as described in the finding of fact.

[14] This change reflects the allowance of the second of WRD's exceptions, which corrects an error in the description of the location of the water right. *See*, page 19. The Department also amends this finding of fact to provide a tabulation of the priority date, location, and acreages found by the ALJ to have not been used and therefore not subject to transfer.

10. Mitch Lewis works for WRD, in the Field Services Division.[15] He is the Watermaster for District 10, which includes all of the Malheur-Wright Basin and a portion of the Malheur River Basin. In this role he performed an injury review of these proposed transfers. His finding was that the proposed transfers may be made without injury.

11. Robert Glaeser is a co-owner of Minister and Glaeser Surveying. He is a licensed professional surveyer [*sic*] and Certified Water Rights Examiner in the State of Oregon. In 1994 he was hired to prepare maps for the USFWS to accompany the transfer applications for certificates 28524, 14367, 15197, and 15198. As part of the mapping process, he first employed aerial photographic mapping. These photographs were used to prepare preliminary base maps that were then used to do a field survey of actual water use at the Refuge. The field survey was accomplished by examining the aerial photographs to determine which areas had historically received water at the Refuge. Those areas which had not received water were excluded from the final transfer maps. Also excluded were areas covered by roads, canals, levies and rivers and some areas that showed on the photographs as open water. The accuracy of the maps was checked by a ground survey in 1995. After consultation with the USFWS, it was determined that certain areas that appeared to be open water in aerial photos were actually irrigated Refuge lands, not open water.

12. Michael Eberle is a Supervisory Hydraulic Engineer employed by the USFWS regional office in Portland, Oregon. In this role he is responsible for the protection and acquisition of water rights for the region, including the Refuge. He is familiar with the Refuge's use of water and its rights under the Donner und Blitzen Decree. He was responsible for the research that determined that many areas identified as open water during the initial aerial surveys taken for preparation of the transfer maps were in fact areas that had been irrigated at least once every five years for the last 15 years. In particular, he determined that many areas identified as "ponds" or open water were managed on a habitual drain and fill cycle with the object of producing aquatic habitat containing the appropriate vegetation for migrating waterfowl. Some ponds are filled and drained annually, others may be filled for several years before being drained out. He determined that all areas that were drained to the level that they produced emergent plant vegetation were irrigated lands. He has reviewed the transfer maps accompanying this transfer application and believes that they accurately reflect the actual areas irrigated on USFWS land within the Refuge.

13. Tom Downs is a USFWS employee who has worked at the Refuge since 1984. He is currently employed as a work leader (field work supervisor) who oversees various projects throughout the Refuge. He has also been employed as a maintenance mechanic irrigator and equipment operator at the Refuge since 1984. These duties have made him familiar with the entire irrigation system utilized within the Blitzen Valley portion of the Refuge. He affirms the accuracy of the transfer maps submitted with these transfer applications. The transfer maps, with one exception discussed below, accurately reflect the actual areas irrigated on USFWS land within the Refuge. In particular, he affirms the irrigation of ponds throughout the Refuge for purposes of emergent vegetation management in support of wildlife. He is familiar with Refuge practice of cyclically filling and draining ponds for this purpose and confirms that it has been the Refuge's regular practice for ponds throughout the Refuge.

14. Blake Nuffer worked for the USFWS at the Refuge in 1985 through 1986 and again from 1989 through 1992. He observed various locations proposed for transfer under water at the time he worked

[15] Mr. Lewis has retired from OWRD.

there, but did not observe any ponds for a five-year-period. He was not familiar with the Refuges biological management plans while he worked there and did not understand the management of land for the production of emergent plants to be irrigation.

15. Marvin Jess was employed at the Refuge from 1962 through 1993, primarily as a crane operator. He has identified numerous ponds and land tracts within the Refuge as not "irrigated", but recognized that they were managed for the production of emergent vegetation or wildlife habitat, a usage he did not consider to be irrigation.

16. William (Bill) Neal is retired after serving for 21 years as the Watermaster in District 10, which covers all of Harney County, part of Malheur County, part of Grant County, and part of Lake County. He has identified numerous ponds and land tracts within the Refuge as not used for irrigation, but acknowledged that he had no direct knowledge of whether they were managed for the production of emergent vegetation or wildlife habitat.

17. In order to promote plant growth and nourish plants, the Refuge has a complex "moist soil management practice." The Refuge uses some water to irrigate fields for farm crops. The Refuge also irrigates native grasses, only some of which is mowed and hayed. The Refuge also irrigates marshes and wetland areas, some of which have shallow standing water on a regular basis. The Refuge uses ponds as part of its biological plan. Most ponds are shallow and dense in emergent vegetation. The Refuge drains all of its ponds in a regular cycle with the intent to promote emergent plant growth as part of its biological plan. Water use in ponds and wetlands at the Refuge varies depending on their current cycle from being completely dry, to a mere sheen of water on the surface, to several feet of water. At all stages the water is being artificially applied to promote plant growth and create wildlife habitat.

18. The Grain Field area has been irrigated on a regular basis for 20 years.

CONCLUSIONS OF LAW

The Department adopts this section of the ALJ's Proposed Order with modification to Conclusion of Law B. to address the acres excluded from transfer.

A. The proposed changes as described by the transfer applications will not result in injury to existing water rights through a net loss of water available to downstream water rights.

B. A portion of the water rights to be transferred has been shown to be subject to exclusion from transfer for non-use [21.1 acres]. After excluding the portion of the water rights for which nonuse is established, the proposed changes as described by the transfer applications will not result in injury to existing water rights through enlargement of the water rights proposed to be transferred.

C. The proposed changes as described by the transfer applications will not result in injury to existing water rights. The original place of use of the proposed water rights to be transferred can be prevented from receiving water from the same source.

D. The proposed changes as described by the transfer applications will not result in injury to existing water rights, due to the proposed transfers, through a change in the quantity of water previously available to another water right and to which the other water right is entitled.

OPINION

The Department adopts this section of the ALJ's Proposed Order and amends the Opinion only to make two corrections. First, it corrects the location of the lands above Krumbo Reservoir, so as to reflect the allowance of WRD's second exception. *See* page 19. Second, the opinion is modified to replace the term "return flow" with the term "water" as that term is used to describe water to which Mr. Dunbar is legally entitled.

The Malheur National Wildlife Refuge is a unique water user with unusual needs. The Refuge is an immense area, covering over 180,000 acres with the Blitzen Valley portion alone (that portion of the Refuge involved in this transfer) covering over 65,000 acres. The water rights in dispute are proposed for transfer from lands within the Blitzen Valley that cover a lesser portion of the Blitzen Valley (approximately 33,000 acres) for use on the Refuge's entire Blitzen Valley holdings. The management of water on the Refuge is very complex, and has always been so, even when it was a working ranch. The Refuge's water has been consistently managed, however, to meet its primary purpose as a Refuge and breeding ground for migratory waterfowl and other wildlife. The Refuge uses its water to provide habitat to migratory birds and other wildlife. The habitat includes grains, grasses, wetland plants (often called emergent vegetation) and small ponds. All of those uses are part of meeting the Refuge's purposes. Even though some commercial crops are grown, even these provide food, cover or other benefits to wildlife. For instance, some grasses are hayed in order to promote new growth, while other grasses are left standing. Again, when grains are grown and harvested, some grain is left for the wildlife. Additionally, wetland plants provide a number of benefits to waterfowl, including nesting, resting and feeding. Ponds are also necessary for wildlife species that need some amount of open water.

The Refuge describes these transfers as seeking three changes to clarify to the public that what it is doing is in fact irrigation, even though it believes its current water usage qualifies as irrigation under its existing certificates. These changes are:

1) A change in the character of use from "irrigation, domestic and stock" to "wildlife refuge management" including specified sub-uses described in the application.

2) The addition of points of diversion. The size of the Refuge requires that many points of diversion be used in order to spread the water by flood irrigation.

3) A change in the place of use to all of the lands within the Blitzen Valley portion of the Refuge. The existing place of use is approximately 33,000 acres of the approximately 65,000 acres of land within the Blitzen Valley portion of the Refuge.

JURISDICTION

HSWCD argued at hearing that WRD lacked jurisdiction under ORS 536.310(1) because the draft permits, WRD Exs. 6, 7, 8 and 9, make an impermissible change in use from "irrigation, domestic and stock" to "wildlife refuge management etc." While WRD objected that this was a legal issue that had been determined prior to hearing, I allowed argument and the presentation of evidence on this issue. I now find that WRD was correct in characterizing this issue as determined prior to hearing. In the August 14, 2001 Ruling on Legal Issues I found that the proposed use's incorporation of "sub uses" is valid under Oregon law. The Department argued persuasively that existing law contains several examples of "beneficial uses" incorporating "sub uses" which are, to some extent, open ended. There is no legal support for protestants' argument that the Department may not adopt a water use definition that incorporates other uses. HSWCD also argued that the proposed change from a rate and duty appurtenant to an acre to a "global rate and duty that can be applied anywhere in an area globally described by section" is not within the jurisdiction of the WRD. I agree with WRD that this issue was properly raised during the preheating stage of this hearing and may not be readdressed.

INJURY - DUNBAR

The protestants argue that the evidence produced at the hearing demonstrates that injury will occur if the proposed transfer is approved. Pursuant to OAR 690-015-0050 [renumbered OAR 690-380-5000], a transfer shall not result in injury to existing water rights. The rule states:

> (1) A transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right. Injury shall include the following:
>
> (a) A transfer would result in a net loss of water available to downstream water rights; or (b) The water right to be transferred would be enlarged.
>
> (2) An injury to an existing water right or an enlargement of the water right to be transferred shall be determined to result from, but is not limited to, the following:
>
> (a) A change reducing the quantity of water previously available to another water right and to which the other water right is entitled;
>
> (b) A diversion of more water than is specified as a rate of flow or duty of water per acre for the subject water right; or
>
> (c) Under a change in place of use, the original place of use cannot be prevented from receiving water from the same source.

The protestants argue that Andy Dunbar will be injured if the transfer is approved because he will not receive water to his property from the applicant's land, both surface flows and groundwater flows, that he feels he has a right to. Dunbar testified that he receives water from surface water delivery systems on the Refuge. There was testimony presented from both Dunbar and Water Master Beal that if the transfer went through and the Refuge decided not to irrigate the portions of land near Mr. Dunbar's ranch, he would not receive the water he normally gets through the surface water delivery systems that run by his ranch. Additionally, Dunbar testified that he receives subsurface water from irrigation on Refuge property. If the Refuge were to change its management style they could

move water entirely away from Mr. Dunbar's property and he would no longer receive those subsurface flows.

The protestants also point to the testimony of Andy Dunbar, supported by measurements of Water Master Beal, that groundwater levels on Dunbar's property are hydrologically connected to levels on the Donner und Blitzen. They argue that changes in operations could result from the transfer that will affect Dunbar, with potential injury due to a hydrological connection between Dunbar's well and the Donner und Blitzen River. They argue that there was persuasive testimony from both Beal and Dunbar that there is a connection between the two that has not been properly examined in determining whether there is the potential for injury.

Finally, protestants point out that Dunbar has water rights that have senior, equal and junior priority dates to the applicant's various rights. Because the applicant can move those priority dates around under the proposed order, Dunbar feels they could be "used against him." Dunbar believes he will be injured because applicant will be adding nine points of diversion to its currently recognized seven points of diversion. All of these points of diversion are upstream from Mr. Dunbar and none are controlled by a rate. The applicant, after the transfer, could take all of its water or none of its water from any of the points of diversion, bypassing the Sodhouse Dam that Dunbar currently uses completely if it chose to do so. Thus, the transfer would hypothetically allow the applicant to either flood or dry up the land contiguous to his. In either case, he believes that it would be injurious to his ability to obtain water of his own that he has a right to. He also believes that the proposed transfer, by adding diversion points above his, could reduce the quantity of water previously available by allowing the applicant to divert water, even all the water, currently available to him. He notes that the transfer process would recognize a historical diversion point, Sodhouse Dam, as a point of diversion for the applicant, disregarding Dunbar who has had a historical use of the diversion point. Because he has no written agreement with the applicant that the historical delivery point will continue, he fears that he will be injured.

I find the argument of WRD and USFWS persuasive that the protestants have not shown injury to Dunbar as a result of this transfer; rather, the preponderance of evidence in this case shows that there is no injury. Injury is not a vague notion or speculation of enlargement. The transfers proposed will be limited to the rate, duty and season of the original rights. And they will be further limited by stipulation of the applicant to prevent splitting a duty of acres annually designated for irrigation. The new right will not allow any more rate or duty, any more water, than the original right. The allegation that Dunbar's wells will be injured is purely speculative and unsupported by any evidence. While Dunbar has testified that his well is hydrologically connected to the river, there is no reason to believe that both will not continue to receive water. While Dunbar may currently benefit from sub-surface and [surface] water when USFWS irrigates its lands, that is not a legal entitlement or part of Dunbar's legal water right. The preponderance of evidence in the record indicates that Dunbar will continue to receive the amount of water to which he is legally entitled, from his authorized sources, both surface and ground water.

USFWS characterizes all of the protestants' problems as originating from the fact that their rights are junior to most of the Refuge's rights. I agree. The protestants have simply not shown how these transfers will lessen the amount of water in the river to which Dunbar has a legal right. Dunbar's main concern is the continued permissive use the USFWS has given him for his diversion from

Sodhouse Dam. In regard to the addition of Sodhouse Dam as a point of diversion, USFWS correctly points out that neither the certificates nor decree indicate a point of diversion for Dunbar at either Sodhouse Dam or Bull Ditch. The Decree did authorize a property other than Dunbar's to use Bull Ditch as a point of diversion, but Dunbar's authorized point of diversion is the river. His claims regarding access to his point of diversion are simply not a question of injury, but a property matter that is not within the jurisdiction of this hearing. Finally, Eberle testified that USFWS intends to continue to operate the Refuge in a historically similar manner. Water Master Lewis, aware of this intent, testified that there is no change in water use, and no probable change in water use, that could result in harm to Dunbar. Physically, it simply cannot happen because his property lies at the north end of the system where the water feeds into the mouth of Malheur Lake.

INJURY - HAMMONDS

Water for Life points out that applicant currently has no rights to irrigate the lands above Kern Reservoir (through which the Hammonds irrigate). *See* WRD Ex. 5 at 14. If the applications go through without application of normal appurtenancy requirements, argues Water for Life, USFWS could move their rights upstream of the Hammonds, from anywhere on the Refuge. It would be a senior water right to the tributaries of the Donner und Blitzen River. USFWS would then be able to divert water into Krumbo Reservoir and place a call on the water the Hammonds are diverting into Kern Reservoir.

As to the Hammonds, USFWS and WRD again argue persuasively that the Hammond's point of diversion is on Krumbo Creek for water rights junior to the USFWS rights. That point of diversion is well upstream of the Refuge's first point of diversion in Krumbo Creek, four miles downstream from the Hammonds, and would remain so after the transfer because the Refuge has not applied for a diversion to be added above the Hammonds' water right. If the Refuge wanted to apply for such an upstream point of diversion, they would have to go through another transfer process like this one. WRD argues that Hammonds are upstream, junior water users to the applicant. No point of diversion of the applicant will be transferred above the Hammond's point of diversion, as illustrated by the draft orders, and therefore there will be no injury.

NON-USE AS ENLARGEMENT

In my ruling on legal issues, I found that the proposed transfer applications as presented to the Department were not in error or deficient because applicant's evidence of historical use of the water rights proposed for transfer is insufficient. Pursuant to ORS 540.520(2)(g), an application to change the use, place of use or point of diversion of a water right shall include "evidence that the water has been used over the past five years according to the terms and conditions of the owner's water right certificate." By Departmental rule such evidence may include affidavits from knowledgeable persons, such as the owner or user of the water right. OAR 690-15-060(12) [renumbered OAR 690-380-3000(12)(a)]. For each application before me, applicant submitted an affidavit by an employee, Forrest Cameron, attesting to historic use of water on the subject lands. (Department's Opening Brief, Exhibit 1). In its pre-hearing argument on legal issues, Water for Life contended that the application's evidence of historical water use was so cursory and lacking in detail that it did not "suffice" as evidence under the statutory standard. (Water for Life Response Brief at 5). In my ruling on legal issues, I found that the applicant's evidence of water use meets the legal requirements set out in ORS 540.520(2)(g) and

OAR 690-15-060(12) [renumbered OAR 690-380-3000(12)(a)] and was sufficient to establish historic use of the water. I found in favor of the Department on this issue.

Nevertheless, while the application and supporting affidavits were sufficient to withstand attack as a legal issue prior to hearing, they remain subject to rebuttal by the protestants at hearing. Here, the protestants have presented persuasive evidence that a portion of the applicant's representation of historical water use at the Refuge was inaccurate. The protestants have phrased this non-use as a question of enlargement and suggest that the transfer should be denied to prevent enlargement. While considering this matter following hearing, I transmitted the following question to the Department pursuant to OAR 137-003-00635:

> In the absence of a pending water right cancellation proceeding pursuant to ORS 540.631, does proof by a preponderance of evidence presented at hearing demonstrating that a portion of the water right sought to be transferred has not been used in the past five years according to the terms and conditions of the owner's water right certificate or is subject to forfeiture under ORS 540.610 demonstrate an enlargement under OAR 690-015-050 [renumbered OAR 690-380-0100(2)]and injury pursuant to ORS 540.530?

The Department has responded with the following discussion, which I adopt as my own:

> The application requirements and standard of review for a water right transfer application are set out in ORS 540.505 to ORS 540.580 and OAR Chapter 690 Division 15 [renumbered Division 380]. Under ORS 540.520(2)(g), a transfer application must include:
> Evidence that the water has been used over the past five years according to the terms and conditions of the owner's water right certificate or that the water right is not subject to forfeiture under ORS 540.610.

See also OAR 690-015-0060(12) [renumbered OAR 690-380-3000(12)(a)] (giving examples of the types of evidence that may be submitted to show use of the water right). Thus, a transfer applicant may show either that the subject water rights have been used over the past five years, or that, if the water rights have not been used, they are not subject to forfeiture under ORS 540.610, which sets out several exceptions to forfeiture.

A transfer application that meets all of the application criteria is reviewed to determine whether the proposed transfer will cause injury to existing water rights. ORS 540.520(7). "Injury to an existing water right" means a proposed transfer would result in a water right not receiving the water to which it is legally entitled." OAR 690-015-0005(5) [renumbered OAR 690-380-0100(3)]. Examples of injury set out in rule include enlargement.

(1) A transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right. Injury shall include the following:

(a) A transfer would result in a net loss of water available to downstream water rights; or

(b) The water right to be transferred would be enlarged.

(2) An injury to an existing water right or an enlargement of the water right to be transferred shall be determined to result from, but is not limited to, the following:

(a) A change reducing the quantity of water previously available to another water right and to which the other water right is entitled

(b) A diversion of more water than is specified as a rate of flow or duty of water per acre for the subject water; or

(c) Under a change in place of use, the original pace of use cannot be prevented from receiving water from the same source.

OAR 690-015-0050 [renumbered OAR 690-380-0100]. If a proposed transfer can be made without injury to existing water rights, then the application shall be approved. ORS 540.530(1).

Based on the above criteria and standards, the Hearing Officer has asked whether proof that a portion of the water rights sought to be transferred have not been used within the past five years and are not otherwise exempt from forfeiture, necessarily demonstrates an enlargement under OAR 690-015-050 [renumbered OAR 690-380-0100(2)] and injury pursuant to ORS 540.530. This question presumes that a portion of the water rights sought to be transferred fail to meet a necessary requirement for a transfer application. Under ORS 540.520(2)(g), a transfer application must include evidence that the water has been used over the past five years or that it is not subject to forfeiture under ORS 540.610.

If a preponderance of the evidence in a transfer proceeding record demonstrates that a portion of the water right transferred has not been used over the past five years in accordance with the conditions of the certificate and are not otherwise exempt from forfeiture, then the water rights for which non-use has been established cannot be transferred. ORS 540.510 provides that a water right may be transferred "upon compliance with the provisions of ORS 540.520 and 540.530[.]" Because water rights for which evidence of nonuse has been established fail to comply with a specific statutory provision, they may not be transferred. Thus, whether the proof of non-use also demonstrates enlargement and injury is irrelevant. It is not necessary to reach this second level of inquiry for water rights that fail to comply with the initial application requirements.

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[T]he Department proposes that the Hearing Officer exclude from the requested transfer any portion of the water rights sought to be transferred that, based on a preponderance of evidence in the record, has not been used in the past five years according to the terms and conditions of the owner's water rights certificate and is not otherwise exempt from forfeiture under ORS 540.610. Because transfer applications that meet the statutory requirements and that will not result in injury to existing water rights must be approved, only the portion of the water rights for which non-use is established are subject to exclusion from the transfer order,

assuming that the transfer of the remaining portion will not result in injury to existing water rights.

Applying the Department's statement of the applicable law to the facts determined at hearing, I find that the protestants have shown that water rights for certain tracts above Krumbo Reservoir that are currently proposed for transfer have neither been irrigated in the last fifteen years, nor are they capable of being irrigated. The testimony of Bill Beal, Dwight Hammond and Steve Hammond was persuasive that the water rights possessed by USFWS above Krumbo Reservoir, specifically identified at hearing, have never been irrigated and cannot be irrigated due to the lack of a functional water delivery system. This water right is located at Township 30 South, Range 32 East, Sections 20 and 29. *See* WRD Ex. 5-6. As pointed out by protestants, there was no rebuttal to those assertions, and no contrary evidence or testimony. Thus, having "not been used in the past five years according to the terms and conditions of the owner's water rights certificate and*** not otherwise exempt from forfeiture under ORS 540.610," the water rights appurtenant to these tracts of land do not meet the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) [renumbered OAR 690-380-3000(12)] and they may not be transferred. ORS 540.510. Only the portion of the water rights for which non-use is established are subject to exclusion from the transfer order, as I have found that transfer of the remaining portion will not result in injury to existing water rights.

Protestants have also alleged that numerous other acres are subject to forfeiture. They point to the testimony of Lewis, Nuffer, Jess, Beal, Steve Hammond, Dwight Hammond and Downs as supporting the conclusion that many of the acres proposed for transfer were either abandoned or forfeited by the applicant through inconsistent use or certificated storage of water overlaying the land. For instance, Beal testified that Boca Pond covers several sections and many acres overlying acres proposed for transfer and if they are underneath Boca Pond, they cannot be transferred. *See* WRD Ex. 5-7. Steve Hammond testified that several acres in Knox Pond are similarly not eligible because constantly under water. *See* WRD Ex. 5-7. Dwight Hammond testified that the Grain Field area had not been irrigated in more than 20 years. Nuffer and Jess listed multiple ponds and impoundments where they believed water has been stored on top of acres that are now proposed for transfer by the applicant. Protestants argue that any water right on these acres has been abandoned and cannot be transferred because it is subject to cancellation; to do otherwise would allow them to recover those acres and enlarge their water right.

I agree with WRD and USFWS that with the exception of the lands above Krumbo Reservoir mentioned above, protestant' s enlargement argument is focused on conclusions not supported by record. The majority of the nonuse alleged by the protestants is associated with ponds. In essence, protestants are arguing that storage and irrigation cannot coexist. The patterns of water use at the Refuge simply don't fit protestant's traditional model of irrigation that would require a pond to be completely evacuated, tilled, seeded and irrigated in order for "irrigation" to take place. However, in order to promote and nourish emergent plant growth, the Refuge has instituted a complex "moist soil management practice." The Refuge does use some water to irrigate fields for traditional farm crops such as alfalfa and grain. But, the Refuge also irrigates to create marshes and wetland areas, some of which remain almost constantly under shallow water. The Refuge also irrigates native grasses, only some of which are mowed and hayed. The Refuge uses ponds. Most of these are shallow and dense in emergent vegetation. The Refuge also drains ponds with the intent to promote new plant growth.

Throughout the Refuge, the water is artificially applied to promote plant growth and create wildlife habitat.

The Department has promulgated an administrative rule defining "irrigation" to mean:

> [T]he artificial application of water to crops or plants by controlled means to promote growth or nourish crops or plants. Examples of these uses include, but are not limited to, watering of an agricultural crop, commercial garden, tree farm, orchard, park, golf course, play field or vineyard and alkali abatement. OAR 690-300-0010(26).

The Department argues that this definition of irrigation does not require storage and evacuation, use of farm equipment, and seeding. Because water is artificially applied at the Refuge with a clear intent to nourish plants as part of the overall Refuge biological and water management plan, it constitutes irrigation. Downs testified credibly that all of the ponds inquired about had been evacuated at least three or four times in the last 15 years as part of the Refuge's biological management of these ponds. To lawfully undertake such activities, it is necessary to have both consumptive and storage rights, both of which USFWS possesses for the land in dispute.

USFWS irrigation activity is consistent with the Department's interpretation of irrigation as defined by its own administrative rule. The court has previously explained that the Department's interpretation of this rule is entitled to great deference:

> The Department's interpretation of that rule is subject to highly deferential review. As long as the interpretation of an agency's own administrative rule is plausible, we are not at liberty to reject it. *Don't Waste Oregon Committee v. Energy Facility Siting Council,* 320 Or 132, 142-43 (1994). In this case, petitioners do not explain why the Department's interpretation is implausible, only that they disagree with it. *Staats v. Newman,* 164 Or App 18, 24 (1999)

Protestants also argue that the Department's order in *Orchard Water Company* mandates that a storage right or use forfeits or abandons the irrigation use. However, I find that on the facts shown here, there is no conflict. The Department has found that the Refuge's repeated use of shallow, overlying water was an irrigation use with the intent to promote plant growth for wildlife use. While protestants argue that in order to sustain irrigation water rights on land underlying storage there needs to be an evacuation of water and application of water to a crop in order to meet the irrigation purpose, I find the Department's argument that the rule is not in conflict with past case law both plausible and persuasive. *See, e.g., Hennings v. Water Resources Dept.,* 50 Or App 121 (1981) where the court defined irrigation as the "operation of causing water to flow through lands to nourish plants." *See also, McCall v. Porter,* 42 Or 49 (1902), which requires an actual diversion of the water from the natural channel, an intent to apply it to a beneficial use, and the actual application to the use designed. As stated by the *Staats* court, "petitioners do not explain why the Department's interpretation is implausible, only that they disagree with it." *Staats* at 24.

EXCEPTIONS TO THE PROPOSED ORDER

Oregon Water Resources Department's Exceptions

Exception No. 1: WRD states that the ALJ's use of the term "return flow" in describing and dismissing Andy Dunbar's claim of injury is inaccurate. In order to be considered "return flow" upon which Dunbar may legally rely, the subject water would have to flow back into the water source [the Donner und Blitzen River] that Dunbar has a legal right to, and also return to the source above Dunbar's lawful point of diversion. In fact, both USFWS and Dunbar divert water at Sodhouse Dam, which is approximately ¾ mile upstream from Dunbar's property on the Donner und Blitzen River. The water to which Dunbar claims legal entitlement is diverted by USFWS at the Sodhouse Dam and passes by and through Dunbar's property by virtue of USFWS' use and runoff before the water returns to the source. The WRD proposes to remove the term "return flow" from the findings and discussion related to the Dunbar claim of injury, and replace it with the term "water". *See*, Department's Exceptions to Proposed Order, pages 2-3.

This exception is allowed, and the term "return flow" has been replaced with OWRD's suggested term "water" in the four places it is used in Finding of Fact #7, and in the five places it is used in the Opinion. *See*, pages 8, 12 and 13.

Exception No. 2: The Department asserts that the ALJ incorrectly described the location of the lands above Krumbo Reservoir.

This exception is allowed. The description of those lands in this order has been corrected to read "Sections 20 and 29, Township 30 South, Range 32 East, W.M." as being above the reservoir. *See*, page 8 and 17.

Water For Life, Inc., Hammond Ranches, Inc., And Harney County Haygrowers Association's Exceptions

On July 5, 2002, Protestants Water for Life, Inc., Hammond Ranches, Inc., and Harney County Haygrowers Association timely filed exceptions to the ALJ's proposed order. The exceptions are organized in sections titled "Assignment of Error", "Protestant's Findings of Fact", "Factual Argument", "Legal Argument" and "Protestant's Proposed Order", with the sections further subtitled in relation to issues identified for hearing.

These exceptions are addressed below, generally following the protestants' order.

"Assignment of Error"

The protestants correctly note the same error identified by the Department in its second exception above. The exception is allowed and a correction has been made in this order as indicated above.

Protestants' "Findings Of Fact"

The protestants include a section in the exceptions titled "Findings of Fact" and state that the testimony in the hearing of the existence of ponds is generally persuasive evidence that the lands lying underneath have not been used for irrigation. The ALJ weighed the evidence on this issue as it was presented in hearing and the Department adopts the ALJ's findings of fact and conclusions on this issue. The protestant's request to change the ALJ's findings and conclusions is denied.

The full transcript is part of the record and was relied upon for the Proposed Order. Protestant's request to include excerpts of the transcript in this order is denied.

Protestant's "Factual Arguments"

The protestants provide argument on pages 22-25 of the Exceptions that they characterizes as "factual". They are addressed below.

1. Issue 2A

The protestants argue that the Department does not have authority to change the appurtenancy requirements established by the Donner und Blitzen Decree, and the traditional appurtenancy requirements of the prior appropriation doctrine and Oregon law. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The water rights, once transferred, will be appurtenant to the lands in the Blitzen Valley portion of the Refuge. *See* Prehearing Order and Ruling on Legal Issues at 2-4.

The exception is denied.

2. Issue 2B

The protestants argue that then-Refuge Manager Forrest Cameron's affidavit was not sufficient to meet the Department's transfer requirements. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the evidence of water use meets the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) [renumbered OAR 690-380-3000(12)(a)] and is sufficient to establish historic use of the water. Proposed Order at 13-14; Prehearing Order and Ruling on Legal Issues at 4-5.

The exception is denied.

3. Issue 2C

The protestants argue that portions of the water rights proposed for transfer are "not subject to transfer" because allegedly the acreage is under water and thus not capable of being irrigated or was not irrigated historically. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the administrative rules do not prohibit this type of transfer, and the protestants have cited no authority prohibiting such a transfer. Proposed Order at 9, *relying on* Prehearing Order and Ruling on Legal Issues at 5-6.

The exception is denied.

4. Issue 2E

The protestants reiterated their argument in No. 3 above. The response in No. 3 is adopted here.

The exception is denied.

5. Issue 2F

The protestants reiterated their appurtenancy argument in No. 1 above. The response in No. 1 is adopted here.

The exception is denied.

6. Issue 2H

The protestants argue that the Service's transfer application would remove the subject waters from the state's regulatory system by allowing an unrestricted beneficial use no longer subject to regulation. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed transfers will result in water rights that remain subject to regulation in accord with the priority system and the approved conditions of use, in the same manner as any other state regulated right. Prehearing Order and Ruling on Legal Issues at 11.

The exception is denied.

7. Issue 2K

The protestants argue that the Service is prohibited from placing a transferred water right on lands that have an existing water right. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed transfer does not constitute "stacking". Stacking involves an attempt to place two primary rights for the same use on the same acreage, whereas the use under the transfers would be for a different use. Two or more primary rights may be placed on the same lands where each, as here, has a different use. Prehearing Order and Ruling on Legal Issues at 13-14.

The exception is denied.

Protestant's "Legal Arguments"

1. Wildlife Refuge Management Use (Issue 2A)

The protestants argue that "wildlife refuge management" is not a beneficial use. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The proposed use, wildlife refuge management, is a beneficial use. *See* Prehearing Order and Ruling on Legal Issues at 2-4.

The exception is denied.

a. Sub-uses

The protestants argue that the eleven beneficial uses ("sub-uses") of the wildlife refuge management use are not allowed. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ found no legal support for Protestant's argument that the Department may not adopt a water use definition that incorporates other uses. Proposed Order at 10-11; Prehearing Order and Ruling on Legal Issues at 2-4. *See* ORS 537.170(8); ORS 540.520; OAR 690-300-0010.

The exception is denied.

b. Sub-uses Quantification

The protestants argue that each sub-use must be quantified in order to regulate the use and avoid waste. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed limits and conditions on the use rendered the Protestant's assertions unfounded. Proposed Order at 10-11; Prehearing Order and Ruling on Legal Issues at 2-4, and supported by the Department's and the Service's briefs, and the testimony of the Watermaster, Mitch Lewis, stating the use is not unlimited and can be regulated without waste.

The exception is denied.

2. Evidence of Historical Use (Issue 2B)

The protestants argue that the transfer application did not contain sufficient evidence that the water proposed for transfer has been used at least once every five years over the past 15 years. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the evidence of water use meets the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) [renumbered OAR 690-380-3000(12)(a)] and is sufficient to establish historic use of the water. Proposed Order at 13-14; Prehearing Order and Ruling on Legal Issues at 4-5.

The exception is denied.

3. "From" Lands (Issue 2C)

The protestants argue that the lands from which the water is being transferred, so-called "from lands", cannot receive water after the transfer and, further, that the transfer constitutes illegal water spreading or a split rate or duty. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the administrative rules do not prohibit this type of transfer, and the protestants have cited no authority prohibiting such a transfer. Proposed Order at 9, *relying on* Prehearing Order and Ruling on Legal Issues at 5-6.

The exception is denied.

4. Transfer Application (Issue 2D)

The protestants argue that the Department erred in accepting the Service's transfer applications without requiring additional information. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the applications met the requirements of ORS 540.520 and OAR 690-015-060 [renumbered OAR 690-380-3000] and were not deficient. Prehearing Order and Ruling on Legal Issues at 2-3, 6-7. *See* ORS 540.520.

The exception is denied.

5. Tributaries (Issue 2E)

The protestant argues that the proposed transfer is an enlargement of the existing water rights because it includes tributaries to the Donner und Blitzen River as a source for certificate 28524 (T-8309), and the Refuge may not place a "call" on the Diamond area water. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the record was clear that the sources for the water rights include the Donner und Blitzen River and its tributaries. Prehearing Order and Ruling on Legal Issues at 7-9.

The exception is denied.

6. Lawfulness of Wildlife Refuge Management Use (Issue 2F)

The protestant argues that the wildlife refuge management use is unlawful because it would allow use without regard to appurtenancy. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the assertion is unsupported in the record. Prehearing Order and Ruling on Legal Issues at 10.

The exception is denied.

7. Instream Flows (Issue 2G)

The protestant argues that the Service's sub-uses of "aquatic life" and "riparian area enhancement" amount to an instream flow right. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed transfers are not an impermissible instream right. Prehearing Order and Ruling on Legal Issues at 10-11.

The exception is denied.

8. Waiver of State Regulatory Oversight (Issue 2H)

The protestants argue that the Service's transfer application would remove the subject waters from the state's regulatory system by allowing an unrestricted beneficial use no longer subject to regulation. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed transfers will result in water rights that remain subject to

regulation in accord with the priority system and the approved conditions of use, in the same manner as any other state regulated right. Prehearing Order and Ruling on Legal Issues at 11.

The exception is denied.

9. Landowner (Issue 2I)

The protestants assert that the Service needs the consent of the Bureau of Land Management, as an affected federal landowner. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ correctly held that, in a transfer, only the name of the deeded owner of the land to which the water is appurtenant is required and the Service is the deeded landowner. Prehearing Order and Ruling on Legal Issues at 12.

The exception is denied.

10. Land Use Regulation Issue (Issue 2J)

The protestants argue that the Department must comply with local land use regulation. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ correctly held that the Department has complied with its land use coordination requirements which exempt applications for water use on federally owned lands from compliance with local land use planning. Prehearing Order and Ruling on Legal Issues at 12-13.

The exception is denied.

11. Water Stacking Issue (Issue 2K)

The protestants argue that the Service is prohibited from placing a transferred water right on lands that have an existing water right. This issue was fully briefed and decided in the Prehearing Order and Ruling on Legal Issues. The ALJ held that the proposed transfer does not constitute "stacking". Stacking involves an attempt to place two primary rights for the same use on the same acreage, whereas the use under the transfers would be for a different use. Two or more primary rights may be placed on the same lands where each, as here, has a different use. Prehearing Order and Ruling on Legal Issues at 13-14.

The exception is denied.

ORDER

The issues raised by protestants in their protests are addressed and resolved as provided in this order. The Department may issue orders approving Transfer Applications T-8309, T-8310, T-8311 and T-8312.

IT IS SO ORDERED.

Dated at Salem, Oregon this OCT 05 2018,

Dwight French, Water Right Services Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

PLACED IN U.S. MAIL
OCT 08 2018
OREGON WATER RESOURCES DEPT.

Appeal Rights

ORS 536.075(2) and ORS 183.482 allow for appeal of final orders in contested cases. This is a final order in a contested case. This order is subject to judicial review under ORS 183.482. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.482. Pursuant to ORS 536.075 and OAR 137-003-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

CERTIFICATE OF SERVICE

I hereby certify that on October 8, 2018, I served a full, true and correct copy of Final Order in Contested Case in The Matter of the Protests Against Water Transfer Applications T-8309, 8310, 8311 and 8312 upon the parties hereto as follows:

U.S. Fish and Wildlife Service
c/o Gary Ball, Water Resources Branch
911 NE 11th Avenue
Portland, OR 97232
Gary_Ball@fws.gov

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: CMS & Email**

Frank S. Wilson
Office of the Regional Solicitor
601 SW 2nd Ave, Suite 1950
Portland, OR 97204
frank.wilson@sol.doi.gov

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

Harney Soil & Water Conservation District
c/o Marty Goold
P.O. Box 848
Hines, Oregon 97738

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

Andy Dunbar
HCR 72 Box 200E
36076 Sodhouse Lane
Princeton, OR 97721

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

Dwight and Susan Hammond
Hammond Ranches, Inc.
46911 Hammond Ranch Rd
Diamond, OR 97722

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

Laura Schroeder
Schroeder Law Offices PC
1915 NE Cesar E. Chavez Boulevard
Portland, OR 97212

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

Renee Moulun
Oregon Department of Justice NR
1162 Court St. NE
Salem, OR 97301-4096

- ☒ by regular mail, postage prepaid
- ☐ by hand-delivery
- ☐ by facsimile # _____
- ☐ by certified mail # _____
- ☐ **Other: Email**

DATED this 8th day of October, 2018.

Patricia McCarty

Patricia McCarty, Agency Representative,
OREGON WATER RESOURCES DEPARTMENT

Copies to:

Dist 10 watermaster
East Region Manager
File: T-8309, T-8310, T-8311, T-8312

Dorothy Pedersen

From: Greg Nelson
Sent: Friday, September 25, 2009 8:21 AM
To: Dorothy Pedersen
Cc: Sarah Henderson
Subject: FW: Transfers T-8309, T-8310, T-8311, T-8312

I'm forwarding Gary Ball's e-mail to you for…?

Greg Nelson, Field Services Division 503-986-0888
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem, OR 97301-1271

From: Gary_Ball@fws.gov [mailto:Gary_Ball@fws.gov]
Sent: Wednesday, September 23, 2009 1:48 PM
To: Greg Nelson
Cc: Dar_Crammond@fws.gov
Subject: Transfers T-8309, T-8310, T-8311, T-8312

Hi Greg -

Hope you are doing well. I heard that Doug finally really retired - - how much longer are you going to be around?

While doing some database maintenance, I discovered that there were some duplicate records in the proposed place of use tables for these transfers. It turns out that they were probably just typos, after consulting the proposed place of use maps.

1) There are two occurrences of SWNW Section 15, T29S, R32E, on page 11, Attachment C. One of them should be replaced by SENW Section 15, T29S, R32E, as that QQ is shown on the map but not elsewhere in attachment.

2) There are two occurrences of SENE Section 28, T30S, R31E, on page 17, Attachment C. One of them should be replaced by SWNE Section 28, T30S, R31E, as that QQ is shown on the map but not elsewhere in attachment.

Gary Ball, PE, PLS, WRE
Hydrologist, Water Resources Branch
US Fish and Wildlife Service
911 NE 11th Ave
Portland, OR 97232
503-736-4788

STATE OF OREGON

COUNTY OF HARNEY

ORDER APPROVING A CHANGE IN USE, PLACE OF USE, AND ADDITIONAL POINTS OF DIVERSION

Pursuant to ORS 540.510 to 540.530, after notice was given and finding that no injury to existing water rights would result, this order approves, as conditioned or limited herein, TRANSFER 8311 submitted by

U.S. FISH AND WILDLIFE SERVICE
911 NE 11th AVENUE
PORTLAND, OREGON 97232-4181.

The right to be modified was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County as evidenced by a PORTION of Certificate 15197. The decree is recorded in the Order Record of the Water Resources Director in Volume 13, at Page 508. The date of priority is 1885.

The right allows the use of the DONNER UND BLITZEN RIVER, a tributary of MALHEUR LAKE, for IRRIGATION of 83.4 ACRES, DOMESTIC AND STOCK. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 2.08 cubic feet per second prior to June 15 and 1.04 cubic feet per second after June 15, if available at the authorized point of diversion: DUNN DAM – NW¼ SE¼, SECTION 15, T 27 S, RA 31 E, WM, or its equivalent in case of rotation, measured at the point of diversion from the source.

The amount of water used for irrigation, together with the amount secured under any other right for the same lands, is limited to ONE-FORTIETH of one cubic foot per second per acre prior to JUNE 15, and ONE-EIGHTIETH of one cubic foot per second per acre

after JUNE 15, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet for each acre irrigated during the irrigation season from MARCH 15 to OCTOBER 1 of each year.

The authorized place of use is located as follows:

NE¼ SE¼ 23.8 ACRES
NW¼ SE¼ 33.7 ACRES
SW¼ SE¼ 23.9 ACRES
SE¼ SE¼ 2.0 ACRES
SECTION 15
TOWNSHIP 27 SOUTH, RANGE 31 EAST, W.M.

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in the decree.

The applicant proposes to change the use to WILDLIFE REFUGE MANAGEMENT, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control.

The applicant proposes to change the place of use to:

W½ SW¼
SECTION 34
TOWNSHIP 26 SOUTH,
RANGE 31 EAST, W.M.

SE¼ NE¼
SE¼
SECTION 25

NW¼
SECTION 36

TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

NE¼ NW¼
W¼
SECTION 2

ALL
SECTION 3

ALL
SECTION 4

S½ SE¼
SECTION 8

ALL
SECTION 9

ALL
SECTION 10

W¼
SECTION 11

W¼
SECTION 14

ALL
SECTION 15

ALL
SECTION 16

E½
NE¼ NW¼
S½ NW¼
SW¼
SECTION 17

SE¼ SW¼
SE¼
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

NW¼ NW¼
S½
SW¼
SECTION 23

W½
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

ALL
SECTION 33

ALL
SECTION 34

NW¼
W½ SW¼
SECTION 35
TOWNSHIP 27 SOUTH,
RANGE 31 EAST, W.M.

N½
SW¼
W½ SE¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

N½
E½ SE¼
SECTION 6

E¼
SECTION 7

ALL
SECTION 8

ALL
SECTION 9

NW¼ NE¼
W½
SECTION 10

W½
SECTION 15

ALL
SECTION 16

ALL
SECTION 17

E¼
SECTION 18

E¼
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

SW¼ NW¼
SW¼
SECTION 23

SW¼ NE¼
NW¼ SW¼
S½ NW¼
SW¼
W½ SE¼
SE¼ SE¼
SECTION 25

ALL
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

E½
E½ NW¼
NW¼ NW¼
NE¼ SW¼
SECTION 29

E½ NE¼
SECTION 32

E½
NW¼
NE¼ SW¼
SECTION 33

ALL
SECTION 34

ALL
SECTION 35

NE¼ NE¼
W½ NE¼
W½
W½ SE¼
SECTION 36
TOWNSHIP 28 SOUTH,
RANGE 31 EAST, W.M.

W½ NE¼
W½
W½ SE¼
SECTION 1

ALL
SECTION 2

ALL
SECTION 3

N½ NE¼
SE¼ NE¼
SECTION 4

E½
NW¼
E½ SW¼
SECTION 10

ALL
SECTION 11

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 12

ALL
SECTION 13

ALL
SECTION 14

E½
E½ NW¼
SECTION 15

NE¼ NE¼
SECTION 22

E½
NW¼
NE¼ SW¼
SECTION 23

NE¼
W½
W½ SE¼
SECTION 24

W½ NE¼
NW¼
N½ SW¼
SE¼ SW¼
W½ SE¼
SECTION 25

E½
SE¼ SW¼
SECTION 26

SE¼ SW¼
NE¼ SE¼
S½ SE¼
SECTION 34

W½ NE¼
E¼ NW¼
SW¼
SECTION 35
TOWNSHIP 29 SOUTH,
RANGE 31 EAST, W.M.

S½ NE¼
S½ NW¼
S½
SECTION 7

NW¼ SW¼
S½ SW¼
SW¼ SE¼
SECTION 8

S½ NW¼
SECTION 15

NE¼
NE¼ NW¼
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

N½
N½ SW¼
SE¼ SW¼
SE¼
SECTION 19

ALL
SECTION 20

W½
NW¼ SE¼
S½ SE¼
SECTION 21

NW¼ NE¼
N½ NW¼
SECTION 29

NE¼ NE¼
SECTION 30
TOWNSHIP 29 SOUTH,
RANGE 32 EAST, W.M.

SW¼ SW¼
SECTION 2

E½
E½ NW¼
NE¼ SW¼
S½ SW¼
SECTION 3

ALL
SECTION 10

W½
S½ SE¼
SECTION 11

S½ NE¼
W½
SE¼
SECTION 13

E½
N½ NW¼
SE¼ NW¼
E½ SW¼
SECTION 14

N½ NE¼
SW¼ NE¼
E½ NW¼
NE¼ SW¼
S½ SW¼
W½ SE¼
SECTION 15

E½ SE¼
SECTION 21

ALL
SECTION 22

NE¼ NE¼
W½ SW¼
SECTION 23

NE¼
N½ NW¼
SE¼ SW¼
SECTION 24

W½
SECTION 26

ALL
SECTION 27

NE¼ NE¼
S½ NE¼
SE¼
SECTION 28

E½
SE¼ SW¼
SECTION 33

ALL
SECTION 34

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 35
TOWNSHIP 30 SOUTH,
RANGE 31 EAST, W.M.

S½
SECTION 18

½
N½ SW¼
SE¼
SECTION 19

W½
S½ SE¼
SECTION 20

S½ SW¼
SW¼ SE¼
SECTION 27

NW¼ NW¼
SE¼ NW¼
NW¼ SE¼
SE¼ SE¼
SECTION 28

NW¼
SECTION 29

NE¼ NE¼
SECTION 30

NE¼ NE¼
SECTION 33

N½ NE¼
NW¼ NW¼
SECTION 34
TOWNSHIP 30 SOUTH,
RANGE 32 EAST, W.M.

E½ SE¼
SECTION 1

E½ NE¼
NE¼ SE¼
S½ SE¼
SECTION 12

E½
E¼ SW¼
SECTION 13

SE¼ SE¼
SECTION 23

E½
E¼ NW¼
SW¼
SECTION 24

ALL
SECTION 25

E¼
SECTION 26

NE¼ NE¼
S½ NE¼
E½ SW¼
SE¼
SECTION 35

ALL
SECTION 36
TOWNSHIP 31 SOUTH,
RANGE 32 EAST, W.M.

LOT 4
W½ SW¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

ALL
SECTION 6

ALL
SECTION 7

ALL
SECTION 8

N½ NE¼
W½
SECTION 9

NW¼ NE¼
W½
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

W½ NE¼
W½
W½ SE¼
SE¼ SE¼
SECTION 21

W½ NE¼
W½
W½ SE¼
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

W½ NE¼
W½
W½ SE¼
SECTION 33
TOWNSHIP 31 SOUTH,
RANGE 32½ EAST, W.M.

ALL
SECTION 1

NE¼
E½ SE¼
SECTION 2

N½ NE¼
SE¼ NE¼
SECTION 11

N½
N½ SE¼
SECTION 12
TOWNSHIP 32 SOUTH,
RANGE 32 EAST, W.M.

W½ NE¼
NW¼
N½ SW¼
NW¼ SE¼
SECTION 4

N½
SW¼
N½ SE¼
SW¼ SE¼
SECTION 5

ALL
SECTION 6

N½
N½ S½
SECTION 7

NW¼ NE¼
NE¼ NW¼
W½ W½
SECTION 8
TOWNSHIP 32 SOUTH,
RANGE 32½ EAST, W.M.

The applicant proposes to add the following additional points of diversion:

NEW BUCKAROO DAM - NW¼ NW¼, SECTION 6, T 32 S, R 32½ E, WM; 1356 FEET SOUTH AND 381 FEET EAST FROM THE NW CORNER, SECTION 6;

OLD BUCKAROO DAM - SW¼ SW¼, SECTION 31 T 31 S, R 32½ E, WM; 602 FEET NORTH AND 50 FEET EAST FROM THE SW CORNER, SECTION 31;

BRIDGE CREEK/EASTSIDE CANAL DIVERSION - NW¼ NE¼, SECTION 32, T 31 S, R 32½ E, WM; 852 FEET SOUTH AND 1796 FEET WEST FROM THE NE CORNER, SECTION 32;

KIGER CREEK DIVERSION - NW¼ NW¼, SECTION 21, T 29 S, R 32 E, WM; 66 FEET SOUTH AND 135 FEET EAST FROM THE NW CORNER, SECTION 21;

McCOY CREEK STRUCTURE - NW¼ SW¼, SECTION 21, T 29 S, R 32 E, WM; 2260 FEET SOUTH AND 960 FEET EAST FROM THE NW CORNER, SECTION 21;

KRUMBO POND DIKE - NW¼ NE¼ SECTION 24, T 30 S, R 31 E, WM; 635 FEET SOUTH AND 1779 FEET WEST FROM THE NE CORNER SECTION 24;

KRUMBO RESERVOIR DAM - NE¼ NW¼, SECTION 19, T 30 S, R 32 E, WM; 1082 FEET SOUTH AND 1976 FEET EAST FROM THE NW CORNER, SECTION 19;

SODHOUSE DAM - SE¼ SE¼, SECTION 3, T 27 S, R 31 E, WM; 856 FEET NORTH AND 4 FEET WEST FROM THE SE CORNER, SECTION 3;

DUNN DAM - NW¼ SE¼, SECTION 15, T 27 S, R 31 E, WM; 1436 FEET NORTH AND 2527 FEET WEST FROM THE SE CORNER, SECTION 31;

PAGE SPRINGS DAM - SW¼ SW¼, SECTION 8, T 32 S, R 32½ E, WM; 815 FEET NORTH AND 583 FEET EAST FROM THE SW CORNER, SECTION 8;

GRAIN CAMP DAM - NE¼ SE¼, SECTION 26, T 29 S, R 31 E, WM; 859 FEET SOUTH AND 527 WEST FROM THE NE CORNER, SECTION 26;

BUSSE DAM - NW¼ NE¼, SECTION 22, T 28 S, R 31 E, WM; 906 FEET SOUTH AND 2094 FEET WEST FROM THE NE CORNER, SECTION 22;

BLITZEN CANAL - SE¼ SE¼, SECTION 24, T 31 S, R 32 E, WM; 51 FEET NORTH AND 69 FEET WEST FROM THE SE CORNER, SECTION 24;

END OF BLITZEN CANAL - NW¼ NW¼, SECTION 35, T 28 S, R 31 E, W.M.; 189 FEET SOUTH AND 978 FEET EAST FROM THE NW CORNER, SECTION 35;

BRIDGE CREEK DIVERSION - NW¼ NE¼, SECTION 29, T 31 S, R 32½ E, WM; 87 FEET SOUTH AND 2474 FEET WEST FROM THE NE CORNER, SECTION 29;

THESE CHANGES TO AN EXISTING WATER RIGHT MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE WATER USER:

1. The proposed changes shall be completed on or before October 1, 2002.

2. The quantity of water diverted at the new points of diversion, together with that diverted at the old points of diversion, shall not exceed the quantity of water lawfully available at the original points of diversion.

3. The amount of water used for Wildlife Refuge Management is limited to 2.08 cubic feet per second prior to June 15, and 1.04 cubic feet per second after June 15, and shall be further limited to a diversion of not to exceed 250.2 acre-feet during the irrigation season from March 15 to October 1 of each year.

4. The water user shall not irrigate or partially irrigate more than 83.4 acres, during the irrigation season, in any year as a part of this right.

5. The water user shall install and maintain headgates, in-line flow meters, weirs, or other suitable control devices for measuring and recording the quantity of water diverted. The types and plans of the headgate and measuring devices must

be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

6. The water user shall submit and obtain approval of a water use measurement plan and implementation schedule, which addresses this use, prior to use of water under this transfer.

7. The water user shall install, operate and maintain the headgates and measuring devices as required. The water user shall report total flow figures when requested by the Watermaster. The Watermaster shall monitor the accuracy of the measuring devices, as needed. Accuracy of the measruing devices shall be within ±##% of actual.

8. The water user shall allow the Watermaster access to all control and measuring devices and all points of diversion upon reasonable notice.

9. Water shall be acquired from the same surface water sources as the original points of diversion.

10. The water user shall provide annual written notice to the Watermaster indicating the number and location of acres to be irrigated.

11. The U.S. Fish and Wildlife Service shall provide copies of any water management plans developed for use of water for the Malheur National Wildlife Refuge to the local Watermaster.

Certificate 15197 is canceled. A new certificate will be issued to confirm that portion of the right NOT involved in this transfer. When satisfactory proof of the completed change is received, a new certificate confirming this water right will be issued.

WITNESS the signature of the Water Resources

Director, affixed _____.

_____

Paul R. Cleary, Director

Water for Life, Inc.
A Non-Profit Organization
www.waterforlife.net

C: Paul
Bly
Tom P.

RECEIVED
JUL 08 2002
WATER RESOURCES DEPT.
SALEM, OREGON

July 6, 2002

Dan Thorndike, Chair
Oregon Water Resources Commission
158 12th Street NE
Salem, OR 97301

Re: Exceptions to the Proposed Order In the Matter of the Protests Against Water Right Transfer Applications T-8309, T-8310, T-8311 and T-8312

Dear Chair Thorndike and Commission Members:

Protestants Water for Life, Inc., Hammond Ranches, Inc., and Harney County Haygrowers Association submit the following Exceptions to the Proposed Order issued June 10, 2002, by Hearing Officer Paul Vincent in the above referenced contested case proceedings. These proceedings involve four consolidated water right transfer applications filed by the U.S. Fish and Wildlife Service [also referred to as Applicant or Refuge]. These Exceptions relate to the factual determinations made by Hearing Officer Vincent within the June 10, 2002, Proposed Order, as well as the legal conclusions within the August 14, 2000, Prehearing Order and Ruling on Legal Issues, and other prehearing rulings, particularly those adverse to Protestants' allegations that many acres of Applicant's water rights are not subject to transfer due to five or more consecutive years of non use.

INTRODUCTION

After years of complaints that the Malheur National Wildlife Refuge, administered by U.S. Fish and Wildlife Service, was not exercising all its irrigation

P.O. Box 12248
Salem, Oregon
97309-0248

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(503) 375-6003

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season water rights, or was doing so in a manner inconsistent with state law, the federal government has applied to transfer over 32,000 acres of water rights, primarily for irrigation and livestock on the Refuge, to a new and unprecedented use: wildlife refuge management.

Protestants contend that the purpose of these transfer applications are two fold: (1) reclaim water rights that have not been used for over five years and which are currently at substantial risk of cancellation due to non use; and (2) establish a new type of water right that will be immune from future risk of cancellation for non use. Water for Life strongly opposes the dangerous and irresponsible precedent this new beneficial use will have if granted to a federal agency by the State of Oregon.

Moreover, even those water rights that are eligible for transfer should not be allowed in the manner proposed by U.S. Fish and Wildlife Service and the Water Resources Department.

The proposed wildlife refuge management use abandons traditional appurtenancy requirements. The transfers will allow water rights with various senior priority dates to be moved anywhere on Refuge property without regard to the original acres associated with those rights. This scheme will both enlarge the original water rights and potentially cause injury to at least one downstream water user, Dunbar Ranch, and interfere with the storage rights of an upstream water user, Hammond Ranches.

Protestants request that the transfer applications be denied. Alternatively, if the Commission approves of the transfers in part or in whole, the following actions should be taken first:

- Correct the proposed order as cited in the assignment of error below.
- Require a cancellation proceeding to resolve the allegations of non-use for a period of five or more consecutive years regarding the approximately 32,000 acres proposed for transfer.
- Direct the Department to investigate whether the approximately 7,000 remainder acres not proposed for transfer are subject to cancellation due to non-use for a period of five or more consecutive years.
- Require the transferred water rights to adhere to the appurtenancy conditions mandated by Oregon law.

- Establish rate and duty quantifications for each of the sub-uses proposed under Wildlife Refuge Management.
- Condition the Final Order to prevent Hammond Ranches and Dunbar Ranch from being injured.

ASSIGNMENT OF ERROR

As a preliminary matter, Protestants note an error within Hearing Officer Vincent's Proposed Order. The Hearing Officer correctly found that water rights possessed by USFWS above Krumbo Reservoir are not eligible for transfer and must be excluded from the proposed transfer orders. Order at 16 and 18. But, referring to testimony and WRD Ex. 5-6, the Hearing Officer incorrectly identified those water rights as ". . . at Township 31 South, Range 32, Section 20 and portion of Sections 29 and 29 (sic) . . ." Id.

WRD Ex. 5-6 is the correct exhibit, but refers to Township 30 South, Range 32 East. Within that township and range, the acreage appurtenant to the excluded water rights are in Sections 19, 20 and 29. Transcript at 799, 918 and 930.

Protestants request that the proposed order be amended as follows:

"The water rights possessed by USFWS above Krumbo Reservoir at Township 30 South, Range 32 East, Sections 19, 20, and 29, should be excluded from transfer."

PROTESTANTS' FINDINGS OF FACT

Protestants submit the following excerpts of the transcript prepared pursuant to the contested case proceeding in Burns, Oregon, on August 23 through 24, 2001. The following statements are a matter of record and Protestants request they be incorporated into the Final Order.

In particular, we want to draw your attention to the testimony of the following witnesses:

Steve Applegate – expert witness; former WRD employee

Bill Beal – former watermaster

Sen. Ted Ferrioli – state policy maker

Marvin Jess – former Refuge employee

Mitch Lewis – current watermaster

Blake Nuffer – former Refuge employee

To assist the reader we have grouped the excerpts together under the contested issues they address. In many instances the statements overlap and are probative regarding other issues as well.

Also note, certain Refuge ponds have been singled out by name. The existence of these ponds is generally persuasive evidence that the lands lying underneath have not been used for irrigation.

Enlargement

Mitch Lewis at 186: Current watermaster for District 10 (encompassing Refuge property).

Q: "In your experience, have you ever seen a transfer where the applicant has been allowed to transfer an irrigation right to another use which also includes the use of irrigation?

A: No.

Q: In your opinion as a watermaster, if someone were to transfer an irrigation right to another use, which included irrigation, and that transferred that irrigation right, with another right on top of it, created a duty, say it exceeded three-acre feet for duty, would that be an enlargement of that water right?

A: Yes.

Q: Are you familiar with the term 'global transfer?'

A: Yes.

Q: What do you understand that to mean?

A: Basically, like these types of transfers. Taking a – in this case, an irrigation, domestic and stock right, and transferring it to an overall use with numerous sub-uses under that header. Removing the actual appurtenancy of the overall – the original right to, you know, within a landowner's boundaries, such as the Refuge boundaries.

Q: So, then, you would describe this transfer as a global transfer?

A: Yes."

Lewis at 200:

Discussing a September 2, 1999, internal memo from Lewis to WRD employee Larry Nunn in Salem with 18 questions regarding the transfer applications.

Q: "'No. 3,' the third problem you listed. 'Under current transfer laws and rules, if the original POU continues to receive water from the original source, the transfer will not be allowed.

By their own admission, the Refuge has every intent to continue to supply water from the original source to the original POU. They also intend to put the same water on new lands.' (emphasis supplied)

Is this a problem related to injury?

A: I had injury questions on that for Larry Nunn, yes.

*****

Q: Sure. How did that particular problem relate to injury – your injury determination?

A: I thought, perhaps, it could be an enlargement issue.

Q: And did Larry give you information that satisfied you that it was not an enlargement?

A: Yes. Once he explained the concept of this type of global transfer, if you will, the irrigated – it would be limited to irrigate a total of just the acreage that they were going to transfer under this new – under this transfer.

I wasn't clear at that point whether that meant they could take the 32,000 acres of irrigation and irrigate the entire Refuge with it at that time. And that was the reason for that question.

*****

Q: Now, is it your understanding that they could take – they could make a use of irrigation and only use two-acre feet and use the one-acre foot somewhere else on the Refuge for a different purpose?

A: I believe so."

Lewis at 205:

Q: Now, when the Applicant designates a particular acre for its irrigation use and it doesn't use its full acre, three-acre feet, it can,

according to you, move those two acre – it only uses one, it can move those two-acre feet somewhere else on the Refuge; and it could irrigate another parcel for an irrigation use for one acre-foot, if it wanted to?

A: I think so.

Q: And so it could designate 32,000 acres for irrigation use and only use 32,000 acre-feet for that purpose?

A: Uh-huh.

Q: And then it could use the rest of their water, for some other sub-use?

A: Only a sub-use, correct.

Q: Now, if they wanted to use it for some other sub-use and they put it on top of the use for irrigation, can they use more than three-acre feet if they're putting that other use on top of their irrigation acre?

A: I think so. If they didn't exceed the total volume in the year for their entire Refuge rights.

Q: So, they could take their whole duty of water, 32,000-some acre feet, times three, something like 90,000-acre feet, and if they could, they could place it all on one acre; conceivably?

*****

Q: But conceivably this transfer would allow that?

A: They could irrigate up to three feet, a three-acre feet for that acre. And their other uses have no duty limit, on each use, other than the total volume it could use in season under those four original certificates. Yes.

Q: So the answer to my question is 'yes'?

A: Yes."

Lewis at 219: Discussing a September 2, 1999, internal memo from Lewis to WRD employee Larry Nunn in Salem with 18 questions regarding the transfer applications.

Q: "Okay. 'No. 14: If water from 33,000 acres of rights are able to be delivered to an area of approximately 62,000 acres, how do we address a possible enlargement issue?'

Before I ask you whether this relates to injury, I'm going to ask you: what was the possible enlargement issue that you were referring to in this problem that you stated?

A: It was before, like I said earlier, it was a new type of transfer. And this was before I understood what the transfer was actually going to be doing.

*****

Q: And how were you convinced that it wasn't injury?

A: Once I began to get the – once Larry explained to me the concept of this type of a transfer. And that basically we are transferring a flow back, not so much a set appurtenant irrigation right.

Q: It's not really appurtenant, is it?

A: The original water rights they use on certificates, the irrigation rights are appurtenant to those places of use.

Q: Right.

A: This, after these transfers, if they're approved, the water rights, then, and new certificates will be appurtenant to the Refuge property.

Q: So, they're not really appurtenant, because they can only irrigate 32,000 acres and there's 62,000 acres they can spread it on, right?

*****

A: No. Of each year, they would be held to the appurtenancy on the 32,000 acres of irrigation. The next season it may change for that season. The place and use is going to be defined.

Q: If you're a private water user and you have this ten acres of water right, I mean, ten acres of property, and you have the two acres of water right, can you change the place of use to a different

two acres every year without going through a formal transfer proceeding?

A: Not without a transfer.

Q: Okay. And in this water right, there will no longer be a requirement for a transfer proceeding; is that right? They can move –

A: Yes."

Lewis at 223: Discussing a September 2, 1999, internal memo from Lewis to WRD employee Larry Nunn in Salem with 18 questions regarding the transfer applications.

Q: "'No. 15: If we allow a single use right to be changed to a multiple-use right, again, how do we address a possible enlargement?'

Does this question, Mr. Lewis, have anything to do with injury?

A: I thought it did, yes.

Q: Okay. Would you explain?

A: I was just looking at an enlargement, multiple uses out of a single use.

Q: How did Mr. Nunn explain that was okay?

A: Simply as a new type of use, new type of transfer. And I was – by this time of the conversation, he was reminding me again that this was a new type of transfer.

Q: So it sounds to me like Mr. Nunn just kept solving your problem by telling you he was creating a new use?

A: Yes, we were on the phone a long time.

Q: Uh-huh. He didn't offer any other explanation that there was a new statute or a new rule, did he?

A: No. He's a transfer expert."

Steve Applegate at 641: Former Water Resources Department employee for more than 20 years, ending his employment in 1996. He is currently in private

practice as a water resources consultant and is admitted as an expert witness in this proceeding.

A: "I believe that, in several ways, this proposed transfer would result in an enlargement. In the first case, I believe that eliminating the appurtenancy of the water right is, in many cases, would result in injury, if not most."

Applegate at 642: Q: "In your opinion, is there any way that those – this transfer could be conditioned through those orders to avoid enlargement? Or more broad injury?

A: Yes, I believe that's possible. I believe that, for example, if the resultant water rights still retain the appurtenancy to no more acres than the original right applied, I think that would be one condition that would go quite a ways in my mind in reducing the enlargement potential of the water right.

If there was a good deal more investigation, discussion on the part of Water Resources Department and/or the Applicant in developing a more clear record of what the historic use on the Refuge has been on the condition of the water rights that they are proposing to transfer; that is, whether or not they have, in fact, been exercised over the last five years, that in my view, would help resolve the issue.

I believe there's a lot more that should have been done by the Department and Applicants to develop evidence of historic use, and more firmly establish that the rights that they are proposing to transfer, are in fact, transferable."

Injury

Lewis at 232: Watermaster Lewis agrees that under the proposed transfer the Refuge could conceivably use their entire senior water right in portions of the Refuge that would assure protestant Andy Dunbar would be unable to receive water under his junior right.

Q: "Right. But, Mr. Lewis, you added a whole lot of facts that I didn't ask. I'm suggesting to you that there's enough water in the system. But that the federal government is taking all of their water on the north end. And they are no – on the south end, excuse me.

And they are not irrigating it all, the north end. They're leaving it dry, because they don't have to irrigate it under this global right; do they?

A: No.

Q: And if they don't irrigate the north half, it's going to be as you state, 'a long ways,' for the water to travel to Mr. Dunbar.

A: Uh-huh. Yes.

Q: And if he doesn't get his water, he's going to be injured; isn't he?

A: Yes. Potentially. I find it hard to imagine they can take the full rate in three diversions, though.

Q: But the water right allows them to do that?

A: On paper.

Q: And that's what you have to enforce it on; isn't it Mr. Lewis?

A: Uh-huh."

Kern Reservoir

Bill Beal at 807: Immediate past District 10 watermaster for 21 years.

WRD Ex. 5, 14 of 16, T. 30 South, R. 32 East, S. 32, 33.

Beal describes how the transfer application would allow the refuge to shift water rights with senior priority dates and draw from the Krumbo Springs source, thereby interfering with the ability of Hammond Ranches to store water in the Kern Reservoir.

"They could call on all the water from there, and the Hammonds couldn't divert the water from Krumbo Springs to the reservoir like they are at the present time."

Illegal Use

Lewis at 212: Discussing a September 2, 1999, internal memo from Lewis to WRD employee Larry Nunn in Salem with 18 questions regarding the transfer applications.

Q: "No. 6: Mr. Lewis says – this sixth problem on September 2nd, was: 'Since the original rights are for irrigation, after these transfers are complete, they will be subject to the same limitations as the origin rights.

'The Refuge has been diverting water rights to the water, prior to the March 15th start of the irrigation season, and after the October 1st season's end. Is the Refuge aware of these limitations?'

Is that a problem that you identified related to injury?

A: It was at the time. And that was resolved by the fact I was not aware of the new ending applications that the Service was going to submit to cover the non-irrigation portion of the year.

Q: What I would say would be out-of-season use?

A: Yes."

Blake Nuffer at 507: Former Refuge employee.

Asked whether he would be surprised to learn that irrigation season begins on March 15:

"I guess so, since I put water out before then."

Marvin Jess at 584: Former Refuge employee for 31 years.

Recalls two instances where water was diverted before March 15.

Beal at 805: Referring to Wright Pond:

Q: "In your opinion as watermaster, Mr. Beal, did that continue to be an illegal impoundment?

A: Yes. Until they filed for it in the Ponds Bill, the period of '93, I believe. Until they had the Ponds Bill, which they didn't apply for it and make it a legal impoundment."

Beal at 817: Q: "You testified earlier, that in your opinion, the Wright Pond was an illegal impoundment; is that correct?

A: Yes.

Q: Were there any other, in your opinion, any other illegal impoundments?

A: There were several of them. But that was the only one that I was really tied up with or concerned with, because I did use it to deliver water to the people that didn't get water earlier.

And it was up – the only time I regulated it was when it was on a complaint basis. It was just a one-man office, and it was very busy. And so most of our field work was done by complaint, complaint driven. So that's when we were called to deliver water."

Emergent Plant Growth

Jess at 591:

A: "The emergent plant growth that was used by the waterfowl, was what they call smud weed. It would grow up after they drained the water off in the fall or late summer. And that's the only – I never did see anything else beneficial about too much emergents.

Q: Would you classify that more as a wildlife use than an irrigation use?

Q: I would. Yes."

Non Use

Lewis at 207:

Discussing a September 2, 1999, internal memo from Lewis to WRD employee Larry Nunn in Salem with 18 questions regarding the transfer applications.

Q: "Okay. Let's look at the problem you had with your fourth problem here. The fourth problem, is again, 'Under current law and rule, water rights being transferred must have been put to their legal use under the terms and limitations of the original right within the last five years.

It is common knowledge and freely admitted by the Refuge that this has not occurred. They have been using water on lands without benefit of rights, they have not used large portions of these rights, they have been using water outside the irrigation season and for uses not specified by the original rights.'
(emphasis supplied)

Did this problem that you raised have to do with injury?

A: Yes.

Q: Okay. Explain how that had to do with injury.

A: The issue that I wasn't certain of at the time, exactly what grounds, you know, where the water had been applied and exactly how it was being used.

When I spoke to Larry about that, his response and his direction for me was the idea that this is a new type of transfer, it's being done in order to, you know, better describe the usage of water on the Refuge. And this was going to fix that problem use.

Q: But if the water rights hadn't been used, would it be a water right that would be subject to transfer, Mr. Lewis?

A: If it had not been used for five successive years within the last fifteen years, it might not be a valid water right to transfer.

I didn't have any knowledge of that personally, and I still don't. ***But there's nonuse on the Refuge***. (emphasis supplied)

Q: And how would you make an injury determination without that personal knowledge?

A: ***Because it's not my job to verify that the water rights are valid***. And I don't have any cancellations proceedings, any kind of notations on these water rights in my filed in my office. And that's common. (emphasis supplied)

I have to take their water rights at face value. I believe the Applicant's got to submit some kind of a statement that water has been used.

Q: If you would transfer, or propose for transfer, an acre that that not been irrigated in the last five years, would that be an enlargement?

A: It could be, yes.

Q: And that, of course, is an injury; correct?

A: Yes."

Applegate at 677: Former Water Resources Department employee for more than 20 years, ending his employment in 1996. He is currently in private practice as a water resources consultant and is admitted as an expert witness in this proceeding.

Q: "You also suggested that there's an enlargement here because the proposed use doesn't seem to have completed an investigation of those acres that had been irrigated in the last five years. And why do you make that determination? Or why do you have that opinion?

A: Well, based on what I have seen, and the documents that I have seen, the Department is relying upon an affidavit submitted by a former employee of the Refuge, that all of the lands described in the proposed transfer, have been irrigated within the last five years.

That's the extent of, as far as I know, the investigation, if you will, into the historic use under the water rights in question.

And it's just my opinion that in this case, in some examples, that may be enough. In places where the transfer is relatively straight forward and simple, where there is no controversy involved, where there is much lower degree, much lower potential for injury or enlargement, perhaps an affidavit of that nature may be enough.

But in my opinion, in this case it's not. And there should be more investigation by the Department as to verifying the number of acres that are actually – should be allowed to be transferred."

Applegate at 679: Q: "You also suggested that this right was enlarged because that you – your opinion was that there were certain rights that ought to have cancelled before this transfer was drafted for public notice.

Can you explain how you came to that opinion that there's rights that should be cancelled?

A: Well, there's an obvious difference of some 6- to 8,000 acres, in that range, of water rights that the Refuge has, that are not proposed for being transfer – to be involved in this transfer.

Q: Are those called remainder rights?

A: They would be a remaining right. In other words, rights not involved in the transfer. And a new certificate would be issued upon approval of the transfer for all the rights that are not involved in the change.

But again, getting back to some of the testimony and what I've seen in the documents that describe some of those acres as not being – there are just a lot of acres that are suspect.

And if there are 6- or 7,000 acres that they agree that they're not going to request to be transferred, they must have some degree of agreement that perhaps they can't defend the fact that those rights are valid or at least transferable.

So in my opinion, the Refuge – Department should require the Refuge to cancel them or otherwise justify why they shouldn't be cancelled."

Beal at 808:

Q: "Mr. Beal, have you ever had any discussion with either the Water Resources Department and/or the Fish and Wildlife Service about acres that you believe are subject to cancellation?

A: ***I talked to the Water Resources Department about a lot of areas that should have been cancelled or forfeited from non use. And I stated that, also, I thought that should be taken care of before they did their transfer because of the acres involved.***" (emphasis supplied)

Beal at 812:

A: "Here between Township 26 South, and Range 31 East, part of Section 11, part of Section 14, part of Section 26 along the east side here wasn't irrigated. There's portions over here on the west side that wasn't irrigated her in Section 17, 19. The Stubblefield Canal there, wasn't used for a long time.

Q: Mr. Beal, when you say 'a long time,' approximately?

A: Like 10, 12 years, something like that –

Q: Okay.

A: -- that I was familiar with. There's several areas, small areas scattered throughout both sides. Most of the center portion was okay. Diamond Swamp. Going into Diamond, they used to have these grain fields in here. There was a period of six or seven years, that a lot of that wasn't irrigated in here on the east.

Q: Mr. Beal, as you go through, could you identify by township and range where you're pointing?

A: Okay. Excuse me. Township 29 South, Range 31 East, Section 24 East – or east of the canal there in Section 24. And there were just numerous areas where there were small portions that –

Q: Can you just approximate where the small portion were? I know it's hard to be exact.

A: There's areas up here by Oliver Springs in Township 28 South, Range 31 East, in Section 25; 29 South 31 East, Section 8, some of this area 7 and 8 in here along the Lava Beds.

When we, my supervisor and I and Tom Paul from Salem, met with Cameron – with Forrest Cameron and Dan Walsworth and Rebecca Chuck and several other people at the Refuge headquarters with the engineers, we went over their maps, the maps that's on the wall over there.

And we actually went out on the road – out on the Refuge, and checked some of those areas that they had found, they felt was subject to cancellation. And we went with them on the ground and actually looked at some of what they thought was subject to cancellation. And we agreed with their mapping in the areas we looked at, and so –

Q: And were those areas actually cancelled, then?

A: They're in the process – they was in the process the last I knew.

Q: To your knowledge, were they ever cancelled?

A: No, because I retired, and I hadn't heard anything about that before I retired.

* * * * *

Beal at 814:

Q: Okay, Mr. Beal, you were testifying earlier that you had began an investigation and discussion with the Fish and Wildlife Service regarding areas that you thought were subject to cancellation.

And then I believe your testimony was that you were pulled off of that after discussions with the Refuge manager. And, I'm sorry, who did you say was the Refuge manager at that time?

A: Forrest Cameron.

Q: Forest Cameron. Did you also have discussion with the Department about the same – about being pulled off the investigation?

A: Yes. Kent Searles and Tom Paul. Kent Searles was my supervisor out of Baker, the eastern region. Tom Paul was assistant supervisor over the watermasters in Salem at that time.

Q: Was it your understanding at that time, that you had been directed to stop your investigation?

A: Right.

Q: Did anything occur then or later on, that changed your opinion that those acres that you were concerned about or those water rights that you were concerned about were still subject to cancellation?

A: We turned in our affidavits to the effect that they should have been cancelled. A lot of things should be cancelled. And after I retired, I also put in my affidavit to protest the transfer because the cancellations were not completed.

Q: So in addition to filing an affidavit of cancellation at the time that you were pulled off for that investigation, you continued to believe that those lands were still subject to cancellation?

A: Yes."

Cottonwood Pond

Nuffer at 490: FWS Ex. 14: T. 31 South, R. 32 ½ East, S. 19. "Always had some water in it"

Jones Pond

Nuffer at 493: WRD Ex. 5, p. 5 of 16: T. 30 South, R. 31 East, S. 27, 28, 33, 34. "country that went dry for quite awhile . . . More than five years? Parts of it, sure enough did."

Nuffer at 495: "Was the water high enough that there was no emergent growth, as we've heard?"

"Yeah that's right."

Dredger Pond

Nuffer at 497: WRD Ex. 5, p. 5 of 16: T. 30 South, R. 31 East, S. 34.

"It sure enough had water. Yeah. I never did see it dry."

Benson Pond

Nuffer at 499: FWS Ex. 16, T. 30 South, Range 31, East S. 22.

Nuffer identifies which portion of pond never dries up. "Down towards the headgate, down this way."

Crane Pond

Nuffer at 500: FWS Ex. 18, T. 30 South, R. 31 East, S. 10, 11.

"This pond here, Crane Pond, it sure enough had water in it, as long as I was there." And no emergent growth in "channels."

Wright Field Pond

Jess at 552: WRD Ex. 5, 1 of 16, T. 27 South, 28 South, R. 31 East, S. 15, 16.

Q: "Did they irrigate within Wright Pond? Or was it always a pond?"

A: "It was a pond"

Pintail Pond

Jess at 557: WRD Ex. 5, 2 of 16, T. 31, 32 East, S. 16, 17.

Asked whether pond was used for irrigation: "I wouldn't consider it irrigation, no. Because it was primarily what they called a brood pond at that time."

South Stubblefield Pond

Jess at 557: WRD Ex. 5, 2 of 16, T. 31, 32 East, S. 17.

Water stored in pond 9-10 months each year.

Unit Eight Pond

Jess at 561: WRD Ex. 5, 2 of 16, T. 31, 32 East, S. 28,29.

Year round pond.

Skunk Farm Pond

Jess at 568-570: FWS Ex. 40; WRD Ex. 5, 3 of 16, T. 28 South, 29 South, R. 31 East, S. 2, 12.

Asked whether the Refuge irrigated within this seasonal pond: "No, sir. It was a pond, in name only. It was primarily, I guess, for habitat." (569)

Lava Beds Grain Field

Jess at 570: WRD Ex. 5, 3 of 16, T. 28 South, 29 South, R. 31 East, S. 2, 3.

Used to be farmed, but was pond during last years of his employment.

East and West BV Ponds

Jess at 575: WRD Ex. 5, 3 of 16, T. 28 South, 29 South, R. 31 East, S. 2, 3.

Entire area was irrigated farmland prior to dike project in early 1960's, then it was under water as pond.

Center Grain Camp Pond

Jess at 578: WRD Ex. 5, 3 of 16, T. 28 South, 29 South, R. 31 East, S. 2, 3.

Seasonal pond since 1977

South of Grain Camp Dam

Jess at 580: WRD Ex. 5, 3 of 16, T. 28 South, 29 South, R. 31 East, S. 26, 35.

"Its part of the bottomland of the Blitzen River, that lays south of Grain Camp Dam. It runs up there, probably ,what, three miles, maybe four miles. And as far as I know, in the past, they used to hay years ago and irrigate it. But in the last 30 years – or 20 years, I haven't saw any water on it . . . except in the flood stage."

Confirms, no irrigation.

Diamond Swamp/South Swamp

Jess at 582: WRD Ex. 5, 4 of 16, T. 28, 29, R. 32 East, S. 19, 20, 21.

Seasonal swamp with open water since early 1980's when Roundup was sprayed on cattails and tules.

Above Krumbo Reservoir

Beal at 799[1]: WRD Ex. 5, 6 of 16, T. 30 South, R. 32 East, S. 19, 20, 29.

Q: "Okay. While you were watermaster, to your knowledge was this area ever irrigated?

A: Not physically irrigated.

Q: What do you mean by 'not physically'?

A: The water wasn't diverted to it. It was subbed from the little stream that runs past it. And there was some vegetation there. But it wasn't physically irrigated like you put in a headgate and divert the water onto it.

Q: The artificial application of water?

A: Right.

Q: And to your knowledge, are there any water delivery systems that would allow that area to be irrigated?

A. None that I ever saw."

Knox Pond

Beal at 801: WRD Ex. 5, 6 of 16, T. 31 South, R. 32 East, S. 17.

Asked whether Knox Pond was continuously under water:

A: "Every time I went by it, there was water out there.

Q: Okay. Did you see any irrigation, in your opinion, by how you would define irrigation?

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[1] See also, Dwight Hammond's testimony at 918, and Steve Hammond's testimony at 930.

A: None that – because I wasn't – most of time, I wasn't allowed to go in there. But I would go down the center patrol road and you could see the water over there."

Wright's Pond

Beal at 803: WRD Ex. 5, 1 of 16, T. 27 South, R. 31 East, S. 15, 16

Describing the pond as covering 200 acres in section 16 and 110 acres in section 15.

Q: "And during your experience as watermaster, was that area always a pond?

A: Yes.

Q: And under your understanding or irrigation, was that area ever irrigated?

A: It was always – I only saw it dry once or twice, and that was during drought season. It was always considered an illegal storage."

Wildlife Refuge Management as an Impermissible Beneficial Use

State Senator
Ted Ferrioli at 448: Q: "Senator Ferrioli, as a matter of public policy, and in your role as a state legislator, is it the policy of the State to allow beneficial uses to be created at the administrative level before Administrative Rules exist to permit – or statutes exist to permit that use?

A: On the contrary, Mr. Harper. The area of beneficial use and the definition and creation of categories is definitely subject, under public policy in Oregon, to a public process.

I know of no enactment by the legislature or public policy area where the legislature has assigned the role of creation of beneficial uses to any third party."

Protestants Water for Life, Inc. et al. submit the following the factual and legal arguments in support of our conclusion that these proposed transfers should not be allowed as proposed.

FACTUAL ARGUMENT

The following are factual issues identified by Hearing Officer Vincent and argued at the contested case proceeding.

1. Issue 2A

Protestants agree with and adopt the argument presented by the Harney County Soil and Water Conservation District [District] regarding the authority of the Department to change the appurtenancy requirements established by the Donner und Blitzen Decree. See argument 5 below regarding statutory authority to disregard traditional appurtenancy requirements.

2. Issue 2B

In accepting the transfer applications, the Department relied upon the affidavit of FWS employee Forrest Cameron to establish evidence of historical use in accordance with applicant's water rights. The Prehearing Order concluded that Mr. Cameron's affidavit was sufficient to meet the legal requirements of ORS 540.520(2)(g) and OAR 690-15-060(12). Prehearing Order at 5. Protestants contend that Mr. Cameron's subsequent testimony at hearing supports protestant's earlier argument that the affidavit is insufficient in detail to establish the required historical use for an valid transfer application, particularly considering the unique and complicated nature of the proposed transfers.

Specifically, Mr. Cameron testified he spent approximately five days actually verifying the 32,602.6 acres proposed for transfer. He further testified that he was unfamiliar with the specific maps included in the transfer proceedings. Mr. Cameron also testified that due to his managerial responsibilities he spends about two days of each month actually on refuge grounds in any capacity.

Based on the new evidence raised by Mr. Cameron's testimony, Protestants again argue that Mr. Cameron's affidavit is not reasonably sufficient to establish historic use. Based on Mr. Cameron's admitted unfamiliarity with the water rights and appurtenant acres involved with these very large and complex tran applications, it is likely that he

could not know of the eligibility of all the water rights proposed for transfer and, therefore, his affidavit should be considered unpersuasive and be assigned little or no probative value.

Accordingly, if Mr. Cameron's affidavit is insufficient evidence of historical use as Protestants assert, the transfer applications are fundamentally deficient and must be denied, or alternatively returned to the Department for reprocessing with specific evidence of historical use. See ORS 540.520(2)(g).

3. Issue 2C

a. Evidence from Hearing

Protestants demonstrated by a preponderance of evidence at hearing that portions of the water rights proposed for transfer are not eligible for transfer because they are no longer available for the authorized beneficial use of irrigation. In other words, portions of the water rights proposed for transfer are not "subject to transfer." ORS 540.505.

Protestants brought forth evidence that many portions of the water rights proposed for transfer are ineligible because those rights are appurtenant to acreage that is under water and therefore not capable of being irrigated (e.g., Boca Pond, Knox Ponds). There was also testimony at hearing that many of the water rights proposed for transfer are actually appurtenant to acreage that either: (1) cannot be irrigated due to practical impossibility (e.g., all water rights proposed for transfer which are currently appurtenant to T. 30 S., R. 32 E., sections 19, 20 and 29), or (2) are not irrigated as a matter of historical water use (e.g., majority of water rights proposed for transfer which are currently appurtenant to acreage in T. 29 S. R. 31 E. Sections 26, 34 and 35).

Protestants contend that water rights demonstrated by a preponderance of evidence as not eligible for transfer cannot be included in this transfer proceeding. Protestants also assert that the evidence of water rights not eligible for transfer makes it reasonably certain that there are still more unidentified water rights not eligible for transfer due to non use and provides another basis for denying these transfer applications and returning them to the Department for a more thorough investigation.

b. Additional Legal Authority

According to precedent in the form of a final order, water stored for the beneficial use of irrigation downstream does not include irrigation of the lands upon which the

water is stored. In The Matter of the Proposed Partial Cancellation of Water Right Certificate 1627 In The Name of Willow Land & Irrigation Company For Use Of Water From Willow Creek, A Tributary Of Malheur River, Malheur County, Final Order, PC 91-5 (January 27, 1993) (attached). As explained under that final order:

> "In this case, the reservoir and the water levels therein were not **operated** for the purpose of causing water to flow through the lands to nourish plants; the water was stored behind the dam for use on lands downstream. The stored water did not 'flow through' the lands in the reservoir floor, it piled up on top of the lands, in amounts far exceeding the decreed duty of 3 af/ac near the dam end of the reservoir.
>
> * * * * *
>
> In this case, some benefit may have obtained (sic) to the vegetation in the reservoir floor when water was stored on it, but the water was not stored nor was the reservoir regulated for the purpose of irrigating the lands within the reservoir." (emphasis in original). Final Order at 6.

The above referenced final order is consistent with Protestants' position that any water rights for the beneficial use of irrigation must have been used for that purpose in order to be eligible for transfer. Conversely, any irrigation water rights underlying storage, whether that storage is authorized or unauthorized, are no longer available for the beneficial use of irrigation of the acreage underneath those impoundments and cannot be transferred. Allowing the transfer of water rights not subject to transfer would constitute an enlargement.

4. Issue 2E

See argument number 3 above regarding enlargement by transfer of water rights not eligible for transfer.

5. Issue 2F

As previously argued by Protestants, the proposed beneficial use of wildlife refuge management is a violation of the traditional appurtenancy requirements of the prior appropriation doctrine and Oregon law. See ORS 540.510. During hearing proponents of the transfers argued the proposed beneficial use is similar to municipal water use that allows cities and towns to move water anywhere within their service

boundaries.

Protestants contend that municipal water use is a unique beneficial use purposely carved outside of the traditional prior appropriation model as a matter of public policy and is not comparable to the proposed use of wildlife refuge management. For instance, municipalities have: (1) statutory authority to operate jointly with other states, ORS 225.060; (2) statutory authority to appropriate water for reasonable present and future development of hydroelectric plants, ORS 225.300; (3) statutory powers of condemnation, ORS 225.060(2) and ORS 225.050(1).

Applicant is not a municipality. Accordingly, there is no statutory basis for the proposed transfers allowing water use anywhere within the refuge boundaries without regard to appurtenancy of the underlying water rights to the acreage on which the water is to be used.

6. Issue 2H

Protestants reiterate their contention that the nature of the proposed beneficial use will make practical regulation by the Department impossible and thereby create a water right not subject to forfeiture (i.e., *de facto* federal reserved water right).

7. Issue 2K

Various witnesses at hearing testified that more than three acre feet of standing water could exist on refuge lands by stacking other "sub uses" of wildlife refuge management on top of the underlying beneficial use of irrigation. Protestants reiterate that exceeding three acre feet for any reason other than an authorized water storage impoundment is an enlargement of the water rights proposed for transfer. Furthermore, where those impoundments are authorized, the underlying water rights for irrigation are not subject to transfer. See argument 3 above.

LEGAL ARGUMENT

The following legal arguments were made as part of the written legal briefings prior to contested case hearing.

1. Wildlife Refuge Management is Not a Permissible Beneficial Use [2.A]

It is a settled principle under the Doctrine of Prior Appropriation generally, and Oregon water law specifically, that "beneficial use shall be the basis, the measure and the limit of all rights to the use of water in this state." ORS 540.610(1); see generally,

California Power Co. v. Beaver Portland Cement Co., 295 U.S. 142 (1935)(discussing state authority to issue water rights based on prior appropriation system).

The plain meaning of ORS 540.610(1) indicates beneficial use is the dispositive factor for establishing a legitimate water right in Oregon. As the basis, measure and limit of all water rights, beneficial use must necessarily be measurable and subject to limitations. See, PGE v. Bureau of Labor and Industries, 317 Or. 606, 610-12, (1993) (at "the first level" of statutory interpretation the court looks at the text and context of a statutory provision. If the legislature's intent is clear after that analysis, then further inquiry is unnecessary).

A. The "sub uses" sought by applicant are not allowed by statute

The Department describes eleven beneficial uses (wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control) which are identified in the FWS application as "sub uses." Dept. Opening Br. at 4-5. The concept of "sub uses" appears nowhere in statute or administrative rules, however, the Department cites to nine administrative rules and one statutory provision that purportedly authorize beneficial uses similar to those sought by FWS under its umbrella proposed beneficial use of wildlife refuge management. Dept. Opening Br. at 3-4.

As an initial matter, "sub uses" are not recognized by statute and are direct conflict with the fundamental premise of beneficial use. Cf., Benz v. Water Resources Commission, 94 Or App 73, 76-77 (1988) (the court held there was substantial evidence to recognize boron leaching as a beneficial use for the *singular* purpose of reducing boron levels in soil).

The beneficial uses cited by the Department demonstrate why "sub uses" cannot be permitted. In the case of "construction and dust control," ORS 537.040(1) allows a public agency having jurisdiction over roads or highways to register a water use for road and highway maintenance, *construction* and reconstruction purposes. Beneficial use under this provision requires an initial $300 registration fee, annual $50 renewal fees, and various reporting requirements, including maps indicating general location of points of diversion and the maximum amount of water to be used both annually and during any 24 hour period. ORS 537.040(2)-(3).

There are several obstacles to authorizing the "sub use" of construction and dust control under ORS 537.040. First, the statute only applies to public agencies with jurisdiction over roads and highways. The applicant has asserted no such jurisdiction. Second, the statute does not refer to dust control. Third, the proposed "sub use" would remove FWS from the fee requirements otherwise required by statute. Fourth, and most important, by its definition the proposed beneficial use of wildlife refuge management would contravene the Oregon legislature's plain intent that diversion points be identified by map initially and when changed, and that maximum water application be closely scrutinized both daily and annually.

The applicant seeks to use the water rights proposed for transfer throughout the Refuge boundaries rather than in a specific quarter, quarter section with specific acreage. This would type of use would preclude the legislative purpose of ORS 537.040.

B. The "sub uses" sought by applicant are not quantified

In the case of the administrative rules cited by the Department, Protestants reiterate the lack of legal authority to combine these uses as applicant proposes. Dept. Opening Br. at 3-4. Each of the "sub uses" referenced in the administrative rules are arguably subject to measurement and control. The proposed use of wildlife refuge management combines these many uses without regard to the quantity of water to be used on each.

In one month FWS might choose to apply all of its water rights toward one use alone, while in concurrent years if might apply none toward that use. This ever shifting use of water resources would be practically impossible to regulate, and therefore would allow waste – a situation not in the best interests of the people of Oregon. ORS 540.720, 540.990; OAR 690-300-010(5).

This policy of "sub uses" creates a system whereby any water right holder could apply to change the type of use of their water right to define it so broadly as to encompass any and all conceivable uses. For example, an industrial user might survey the current uses listed in the administrative rules and apply for a "corporate management use" and define it in their application as a beneficial use to include, but not be limited to, commercial water use, group domestic water use, industrial water use, mining water use,

pollution abatement or prevention water use, power development water use, recreation water use, and stream or riparian area enhancement water use.

Or the beneficial use of "agricultural water use" could be redefined to include irrigation so that all conceivable water uses within the borders of an agricultural operation would be sanctioned. See OAR 690-300-010(2).

The Department seems to be advocating unlimited beneficial uses not subject to quantification or limitation. Protestants contend this policy is not allowed by law. ORS 540.610(1).

2. Applicant's Evidence of Historical Use is Insufficient [2.B]

ORS 540.520(2)(g) provides that all transfer applications must contain:

> "Evidence that the water has been used over the past five years according to the terms and conditions of the owner's water right certificate or that the water right is not subject to forfeiture under ORS 540.610."

In the present application, the only evidence of historical water use is the cursory affidavit of FWS employee Forrest Cameron. WRD Ex. 1. Mr. Cameron's affidavit does not reveal any detailed basis for his conclusions. Mr. Cameron's mere statement that he was formerly a project leader does not suffice.

In other transfer applications the Department has been unwilling to accept applicants' affidavits of historical use as sufficient evidence of historical water use. For instance, Protestants refer to WFL Att. 1, the June 9, 1999, Final Order in the Matter of the Denial of Reconsideration of Proposed Certificate for Water Use Permit 30789 (hereafter referred to as the "Hale-Hoskins" protest). The Hale-Hoskins protestants were asserting continuous beneficial use of water rights, however, the Department refused to accept the testimony of Mr. Ralph Siebel that certain lands had been irrigated through 1984. Director of the Department, Martha Pagel, opined that "protestants were unable to provide records of power use, crop production, or other documentary evidence for the Section 9 lands." WFL Att. 1 at 5.

In the present case, FWS has similarly not presented supporting documentary evidence that the water rights proposed for transfer have been beneficially used at least one year out of the past five years, or are not subject to forfeiture. Protestants have had an earlier motion denied that sought to suspend this proceeding pending the resolution of

a cancellation request for a portion of the water rights under one of the certificates at issue here (# 28524). See WFL Mot. To Suspend Proceedings, dated March 26, 2001. At issue in that motion is whether applicant must voluntarily cancel those water rights not proposed for transfer as a necessary condition before this transfer application can be processed because the water rights will be for the same acreage.

Accordingly, based on demonstrated Department policy and the concurrent cancellation request pending before the Department, the historical evidence submitted by FWS to support its application is insufficient. The application should not have been accepted and should now be returned to FWS for reapplication.

3. The Applicant Must Dry Up the "From" Lands in Favor of the "To" Lands [2.C]

The applicant seeks to use the water rights proposed for transfer throughout the boundaries of the Malheur National Wildlife Refuge [Refuge] rather than in a specific quarter, quarter section with specific acreage. OAR 690-015-0050(1) provides "[a] transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right," and identifies one type of injury as "[t]he water right to be transferred would be enlarged." Enlargement is at the heart of Protestants' contention that the "from" lands must be dried up in favor of the "to" lands.

OAR 690-015-0050(2)(c) states:

> "An injury to an existing water right or an enlargement of the water right to be transferred shall be determined to result from, but is not limited to, the following:
>
> (c) Under a change in place of use, ***the original place of use cannot be prevented from receiving water from the same source***." (emphasis supplied).

If, as here, the original acreage from which the water right is being transferred ("from" lands) will continue to receive water from the same source, an enlargement has occurred and the transfer application must be denied.

The Department agrees the proposed transfers will not prevent the original place of use from receiving water and, in fact, the very purpose of the new type of use is to allow water use anywhere within the refuge boundaries, including the lands from which

the water is proposed for transfer. Dept. Opening Br. at 7. The Department argues that there is no legal requirement to prevent the receipt of water from the original place of use. Id. at 7-8. Rather, the Department asserts that "nothing prohibits a transfer Applicant from 'picking up' a water right, modifying it in some way, and placing it back on the same lands for a 'different' use." Id. at 8. Protestants disagree and contend the proposed transfer is not a "different" use, it is an enlarged one.

Once again Protestants reiterate the arguments made in conjunction with the WFL Motion to Suspend Proceedings, *supra*. The applicant seeks to use the water rights proposed for transfer throughout the Refuge boundaries rather than in a specific quarter, quarter section with specific acreage. The applicant also seeks to change the type of use to wildlife refuge management, a use that subsumes the currently certificated use of irrigation. Inasmuch as the water rights not subject to transfer will coexist with the rights proposed for transfer on the same lands with the same authorized use (i.e., irrigation), it is impossible for FWS to prevent the original lands from receiving this water. This is direct a violation of Oregon laws prohibiting enlargement of water rights, thus, the proposed transfer is impermissible and the application should be denied. ORS 540.510; OAR 690-015-0050(2)(c).

Finally, Protestants raise the subject of "water spreading." This term is commonly understood to mean an illegal activity occurring when a water right holder uses water on acreage not authorized in the original certificate or permit, and would constitute waste. ORS 540.720, 540.990; OAR 690-300-010(5). This concept can apply to situations where a water users "split" either their "rate" (the amount of water which can be diverted at any given instant, such as one cubic foot per second), their "duty" (the total amount of water than can be diverted annually on a given acre, such as three acre feet per acre per year), or their "season" (precise calendar dates during which the water may be beneficially used, such as between March 15 and October 1).

An example of an unauthorized split duty would be if an irrigator with a right to divert three acre feet of water each growing season to irrigate 40 acres decided to instead use one and one-half acre feet on those 40 acres and use the other one and one-half acre feet on an adjacent 40 acres. Although the irrigator is using the same total amount of

water, the act of splitting the duty is an enlargement of the total acreage of the original right and not allowed.

This is not a hypothetical problem. Recently the Department sponsored legislation, House Bill 2712, establishing a permit process for split season instream leases. In testimony before the Oregon House Water and Environment Committee, Department Director Paul Cleary explained why legislation is necessary to allow split season leases:

> "A water right holder may lease all or a portion of their water right to instream purposes. In order for this to happen, ***the water right holder must 'dry up' all or part of the place of use for the entire irrigation season or year***. This requirement helps the local watermaster make sure the water right holder does not use more water than allowed under the right – a situation that would injure other water rights.
>
> *****
>
> As discussed above, an instream lease under the current program requires a water right holder to dry up all or part of the place of use for the entire season or year in order to lease water instream. Essentially, ***a split season lease under HB 2712 would allow a water right holder to avoid having to dry up all or part of the place of use for the entire season or year.***" (emphasis supplied).

WFL Att. 4.

The same reasoning applies to split duty and rates, and applies to the current transfer applications. What the applicant proposes is splitting its duty between the eleven various uses listed (as well as those contemplated but not identified) in its applications. FWS may choose to use all available water for the aquatic life "sub use" for one season, then use all the water for wildlife the next. Or they could alternate between these "sub uses" from month to month, week to week, or day to day, while simultaneously irrigating the original acreage with a third portion of the available water. The possible permutations are endless.

This is another manifestation of the impermissible consequences of the sub uses advocated by applicant and the Department. The water rights proposed for transfer

cannot be placed on the original acreage without drying up those lands and preventing them from receiving water from the original source.

4. Department Erred by Accepting the FWS Application [2.D]

Notwithstanding exceptions not at issue here, no change in use or place of use of any water for any purpose may be made without compliance with the provisions of ORS 540.520 and 540.530. ORS 540.510(1). According to ORS 540.520(2)(e), applications for transfer must include "the use which is proposed to be made of the water." This requirement is reiterated without elaboration in the administrative rules. OAR 690-015-0060(15).

As discussed above, Protestants contend the "sub uses" allowed by the Department contravene legislative intent that water be beneficially applied to discrete, quantifiable uses subject to measure and limitation. Cf., Benz v. Water Resources Commission, *supra*. The Department erred by accepting the FWS application without requesting specific information as to times of use and relevant amounts of use (e.g., rate and duty) for the various "sub uses" described.

5. The Proposed Transfers from the Tributaries of the Donner Und Blitzen River are an Enlargement of Existing Water Rights [2.E]

The four transfer applications are based on four certificated water rights to either "the use of the waters of Donner und Blitzen River," or "the use of the waters of Bridge Creek, a tributary of Donner und Blitzen River," WFL Att. 3, or "the use of DONNER AND BLITZEN RIVER." WRD Ex. 3. In its application FWS identifies the source of the water proposed for transfer as "Donner und Blitzen River and its tributaries." If approved, this would be an enlargement of applicant's current water right certificates. ORS 540.520.

The Department argues that "read together" the Donner und Blitzen River Decree, WRD Ex. 4, and findings by the State Engineer, WRD Ex. 5, "make it clear the water rights (uses) evidenced by certificate 28524 authorized use of the Donner und Blitzen River and its tributaries." Dept. Opening Br. at 9. Protestants disagree.

With the exception of Bridge Creek's inclusion in T-8312/Certificate 14367, the applicant's water right certificates only authorize diversion from the Donner und Blitzen River, not its tributaries. The Bridge Creek exception proves the rule. If the other

tributaries were intended to be included they would have been expressly identified on the certificates as was the case with Bridge Creek.

Moreover, statute does not provide for the contextual interpretation advocated by the Department. ORS 537.270 provides:

> A water right certificate issued in accordance with the provisions of ORS 537.250 which, after the expiration of three months from the date it is issued, has not been contested and canceled in the manner provided in ORS 537.260, and a water right certificate when issued under ORS 539.140, ***shall be conclusive evidence of the priority and extent of the appropriation therein described in any proceeding in any court or tribunal of the state***, except in those cases where the rights of appropriation thereby described have been abandoned subsequent to issuance of the certificate. (emphasis supplied)

Inasmuch as the period for contesting the certificates at issue here has long since expired, they must be considered conclusive for these proceedings.

Alternatively, if as the Department requests, the certificates are to be interpreted in conjunction with the Donner und Blitzen River Decree [Decree], FWS has still not shown the right to appropriate from all the river's tributaries. The Decree itself refers to a general adjudication much broader than just applicant's water rights. In particular, the Decree sets forth the Diamond area exception. WRD Ex. 4 at 6. This provision allows water users in the Diamond area to "to use the water on lands within said area independently from those on the Donner und Blitzen River . . ." Id.

The plain meaning of the Diamond area exception is to prohibit non-Diamond area water users from appropriating those resources. Or put another way, downstream appropriators may not "call" on Diamond area water. The Refuge is not a Diamond area water user.

This provision would be meaningless if it was determined that FWS' water rights encompass all Donner und Blitzen tributaries, necessarily including those of the Diamond area. Protestants rely upon the accuracy of the certificates without further interpretation. The authorized source of diversion for FWS is the Donner und Blitzen River and the Bridge Creek tributary, not all the tributaries.

6. Wildlife Refuge Management Enlarges Applicant's Water Rights [2.F]

The applicant seeks to use the water rights proposed for transfer throughout the Refuge boundaries rather than in a specific quarter, quarter section with specific acreage. WFL Att. 2. Protestants refer to sections I and III above to support their contentions that the proposed beneficial use of wildlife refuge management is impermissible because it ignores appurtenancy, as well as rate and duty requirements. See ORS 540.510; 540.520.

Appurtenancy centers of the concept that water will be delivered to those lands identified in a permit or certificate. Perfected water rights are appurtenant to the land so that they travel with land. Teel Irrigation Dist. v. Water Resources Dept., 323 Or 663 (1996); ORS 540.510(1).

The Water Resources Department argues, "...the statutes and administrative rules do not prohibit Applicant from exercising the 'transferred' or 'new' water right on the 'from' lands." This is not true. Under OAR 690-015-0050(1) states, "A transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right." Under the same rule, an injury includes a net loss of water available to downstream users ***or an enlargement of the water right being transferred.*** OAR 690-015-0050(2)(c) then states, "An injury to an existing water right or an enlargement of the water right to be transferred ***shall be determined to result from...under a change in place of use, the original place of use cannot be prevented from receiving water from the same source."*** (emphasis supplied) This means that if the land that the water right is being transferred from still has the ability to access the water, an enlargement has occurred, and the transfer shall not be allowed.

Protestants contend the proposed use amounts to "water spreading" because it allows FWS unrestricted authority to shift water within the Refuge boundaries for undetermined purposes and without set amounts for specific rates and duty tied to identified acreage. For instance, each of the water right certificates at issue limit applicant to "a total limitation of three acre feet per acre from March 15 to October 1." WRD Ex. 3. Because the proposed beneficial use will allow applicant to decide where and for what use the transferred water will be applied, it is likely the duty limitation will be violated.

Similarly, there is no quantification as to the amounts of water to be devoted to each of the "sub uses" the Department proposes. Dept. Opening Br. at 4-5. To avoid water spreading, the precise acreage and concomitant rate and duty must be assigned to each "sub use."

7. The Proposed Transfers Establish Unauthorized Instream Flows [2.G]

Protestants and the Department agree that FWS is not authorized to hold an instream water right. Dept. Opening Br. at 12; See generally, ORS 537.322 to 537.360. In defining wildlife refuge management, FWS has included (but not limited) the potential uses of "aquatic life" and "riparian area enhancement." WFL Att 2. Protestants contend that, especially considering the broad and unlimited nature of the proposed use, these terms amount to a description of instream flows.

In particular, the administrative rule cited by the Department as defining the aquatic life use provides: "the use of water to support natural or artificial propagation and sustenance of fish and other aquatic life." OAR 690-300-010(3). By these terms, the proposed use is necessarily nonconsumptive. That is, the water will not be appropriated but instead left instream for the benefit of fish and other aquatic life. These instream flow substitutes are also referred to as bypass flows.

Again the specter of "sub uses" challenges the legitimacy of the beneficial use wildlife refuge management. Without measure and limit, the beneficial use cannot be established. According to the terms of the proposed beneficial use, the Refuge can choose to dedicate its entire water right to the aquatic life "sub use." Doing so will be tantamount to exercising a nonconsumptive instream water right and, Protestants contend, will be a direct contravention of legislative intent.

8. Approval of the Proposed Use Waives State Regulatory Oversight [2.H]

The consequence of establishing the proposed use sought by FWS removes those waters from the state's regulatory system. Awarding a federal agency an unrestricted beneficial use that is no longer subject to practical oversight would create a right enjoying the same insulation from state regulation as a federal reserved right. See e.g., U.S. v. New Mexico, 438 U.S. 696 (1978)(quantity of water reserved limited to the amount necessary for the purposes declared by the initial congressional authority creating the reservation). Granting a state water right that is practically indistinguishable from a

federal reserved right is in direct conflict with Oregon law providing forfeiture provisions for failure to use all or part of a water right for a period of five successive years. ORS 540.610.

The Department seems to argue this regulatory insulation simply reflects the perfectly tailored nature of the proposed right. Dept. Opening Br. at 13-14. Protestants suggest the Department has missed the point.

If an applicant introduces a new beneficial use that is self-defining, it cannot be subject to regulation and is, therefore, immune from forfeiture. The issue is not whether nonuse actually occurs, but whether it *can* occur. If an applicant acquires an unlimited water right, regulatory oversight has been surrendered and nonuse is impossible.

Here, the proposed beneficial use is unlimited by its terms. The beneficial use is precisely whatever FWS claims it to be, so long as they preface their explanation with "consistent with the purposes of the Refuge . . ." The Department will find itself without authority to insert its own judgment as to what the Refuge's legitimate needs may be. Accordingly, the transfer applications must be denied.

9. Consent Was Not Obtained from the Bureau of Land Management [2.I]

According to the concurrent FWS application for a surface water right, the Bureau of Land Management is listed as an affected federal landowner under the category of property ownership. WFL Att. 2 at 11. Inasmuch as the Refuge boundaries are the same subject matter for both these concurrent applications, it seems inconsistent that the Bureau of Land Management was not identified. If there is another federal landowner, consent or joinder as a coapplicant is required and the application must be returned to FWS for reapplication. OAR 690-015-0060(13),(14).

10. The Department Cannot Disregard Comprehensive Plans and Land Use Regulations [2.J]

ORS 197.180 mandates that state agencies must not take actions that are incompatible with acknowledged comprehensive plans. This mandate applies to the Department.

OAR 690-05-0035(1) provides that Commission and Department actions must be compatible with acknowledged comprehensive plans. An exception is allowed where the Commission or Department finds it necessary to take an action which is incompatible

with comprehensive plans in order to meet statutory obligations. OAR 690-05-0035(5). FWS is not entitled to the exception.

Neither the applicant nor the Department claims to have consulted with Harney County regarding the compatibility of the proposed transfer applications with the Malheur Lake Basin Program and Harney County Comprehensive Plan. Nor has the Department claimed an inability to do so and thus an exception should be granted to allow the Department to meet its statutory obligations. Furthermore, the exception provision of OAR 690-05-0035(5) requires implementation of the dispute resolution procedures of OAR 690-05-0040, rather than contested case proceedings.

In asserting that it has complied with its internal rules for processing federal water claims, the Department is ignoring its responsibility as a state agency to ensure compliance with local comprehensive plans and land use regulations. Dept. Opening Br. at 16. See ORS 197.180. Oregon statutes do not provide for a lesser standard of compliance for federal water claims. Accordingly, the applications should be returned to the Department for reprocessing.

11. The Proposed Transfer is Impermissible "Water Stacking" [2.K]

The proposed beneficial use of wildlife refuge management includes irrigation as a "sub use." All four of the certificates proposed for transfer identify irrigation as a beneficial use. If approved, the transferred water rights will be available for use anywhere on the Refuge, including those lands to which they were originally appurtenant. See Section III above. Oregon law prohibits "stacking" two primary water rights for the same use on the same acreage. ORS 540.510(1). Accordingly, the Department must either: (1) complete the pending cancellation request prior to approving these transfer applications, See WFL Motion to Suspend Proceedings, *supra*; or (2) condition the transfers on cancellation of those rights alleged to be forfeited due to non-use. ORS 540.610.

The Department argues that stacking of primary water rights is allowed so long as the rights are for different uses. Dept. Opening Br. at 17. Alternatively, the Department argues that the stacking issue is moot so long as the remaining rights are reclassified as a supplemental water right. Id.

Protestants disagree on both counts. First, the beneficial use proposed cannot be declared different from the original use. Wildlife refuge management is certainly broader than irrigation, but irrigation is still subsumed within its definition. The two are inseparable and cannot be treated differently for the convenience of avoiding the cancellation proceeding.

Second, the remaining rights are not eligible to be transferred to supplemental rights status so long as they are part of an active cancellation proceeding. ORS 540.510(1). By their own admission, it is the Department's practice that "action on the transfer is suspended pending resolution of the cancellation proceeding" where the same water rights are involved with both proceedings. Dept. Resp. to Mot. to Suspend Proceedings, at 2-3, April 18, 2001.

Protestants maintain their request that the transfer applications be conditioned on cancellation of the applicant's water rights not subject to transfer – either through voluntary agreement by FWS or as a mandatory condition of the transfer. Alternatively, Protestants reassert their request to suspend these proceedings pending the outcome of the active cancellation proceedings.

CONCLUSION

Protestants Water for Life, Inc. et al. ask the Commission to deny the transfer applications and return them to the Department for reprocessing consistent with state law.

In the alternative, Protestants respectfully request the following actions be taken prior to approving the above referenced transfer applications:

- Correct the proposed order as cited in the above assignment of error and restated below.
- Require a cancellation proceeding to resolve the allegations of non-use for a period of five or more consecutive years regarding the approximately 32,000 acres proposed for transfer.
- Direct the Department to investigate whether the approximately 7,000 remainder acres not proposed for transfer are subject to cancellation due to non-use for a period of five or more consecutive years.
- Require the transferred water rights to adhere to the appurtenancy conditions mandated by Oregon law.

- Establish rate and duty quantifications for each of the sub-uses proposed under Wildlife Refuge Management.
- Condition the Final Order to prevent Hammond Ranches and Dunbar Ranch from being injured.

PROTESTANTS' PROPOSED ORDER

In the event that the Commission chooses to approve the transfer applications in whole or in part, Protestants Water for Life, Inc. et al. submit the following text concepts for the Final Order:

> ***"The water rights possessed by USFWS above Krumbo Reservoir at Township 30 South, Range 32 East, Sections 19, 20, and 29, should be excluded from transfer.***
>
> ***Prior to approving the transfer orders, the Water Resources Department shall conduct a cancellation proceeding to determine which water rights under Certificates 28524, 15198, 15197 and 14367 are lawfully subject to transfer. Thereafter the Final Orders in T-8309, T-8310, T-8311 and T-8312 (WRD Exs. 6-9) should issue with any necessary exclusions."***

Protestants maintain that a cancellation proceeding is the most expeditious method of ensuring the water rights being proposed for transfer are indeed eligible for transfer. As related in the transcript excerpts above, there is ample evidence of non use within the record to support excluding water rights in addition to those identified by Hearing Officer Vincent.

If the Commission approves the applications without further proceedings, Protestants request that those irrigation water rights lying underneath the ponds referenced above be excluded.

In order to ensure that water rights are not being enlarged, we ask the Commission to restore appurtenancy requirements. For example:

> ***"That portion of Draft Orders in T-8309, T-8310, T-8311 and T-8312 (WRD Exs. 6-9) identifying the change in place of use shall be amended to specify the new places of use according to priority date, township, range and section. In each instance it should be possible to identify***

precisely where the original water right has been authorized for the change in place of use."

To further avoid enlargement, Protestants request that proposed conditions number three and number four be deleted and replaced with conditions that expressly require the Applicant to account for each sub use proposed under the beneficial use Wildlife Refuge Management. We suggest the following condition:

"Rate and duty limitations will be individually determined for each change in place of use and shall be quantified for each of the eleven beneficial uses proposed."

To prevent injury to Hammond Ranches, the final order should restrict Applicant from shifting senior water rights from other portions of the Refuge to the Krumbo Springs source, thereby interfering with the ability of Hammond Ranches to store water in Kern Reservoir:

"The water user shall not interfere with the ability of existing water rights holders to store water in Kern Reservoir."

To prevent injury to Dunbar Ranch, the final order should require applicant to maintain historical water deliveries in the Refuge conveyances that serve the Ranch:

"The water user shall ensure existing water users will not be prevented from receiving water from the 'Sodhouse Dam' diversion and through the 'Bull Ditch' conveyance."

Protestants reiterate our primary argument that these four transfer applications should be denied and returned to the Department for reprocessing in order to ensure this large, complicated, and unprecedented new water use is compatible with state law. In its current form the proposed order would both enlarge the original right and create the potential for injury to other water users.

Respectfully Submitted,

WATER FOR LIFE, INC.

Brad J. Harper

CERTIFICATE OF FILING AND SERVICE

I hereby certify that on July 6, 2002, I filed the original of the WATER FOR LIFE, INC. EXCEPTIONS via first class mail of the U.S. Postal Service to the following:

Dan Thorndike, Chair
Oregon Water Resources Commission
158 12th Street NE
Salem, OR 97301

I further hereby certify that on July 6, 2002, I served one copy of the foregoing WATER FOR LIFE, INC. EXCEPTIONS via first-class mail of the U.S. Postal Service on the following parties:

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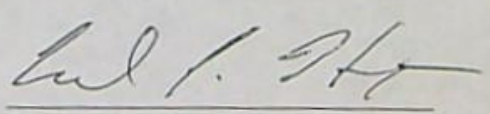

Brad J. Harper,
Of Attorneys for Protestants Water for Life, Inc., Hammond Ranches, and Harney County Haygrowers Association

Bob P / Bernie

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JUN 11 2002
WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
BEFORE THE HEARING OFFICER PANEL
FOR THE WATER RESOURCES DEPARTMENT

In the Matter of the Protests Against Water Transfer Applications T-8309, 8310, 8311, 8312	)	**PROPOSED ORDER**
UNITED STATES FISH AND WILDLIFE SERVICE, *Applicant*	)	
ANDY DUNBAR; Water for Life, INC.; HAMMOND RANCHES, INC.; DWIGHT AND SUSAN HAMMOND; HARNEY COUNTY HAYGROWERS ASSOCIATION; JOHN AND DEBBIE VOLLE; HARNEY SOIL & WATER CONSERVATION DISTRICT; *Protestants*	)	

HISTORY OF THE CASE

On July 28, 1999, the United States Fish and Wildlife Service (USFWS) filed transfer applications T-8309, 8310, 8311 and 8312 with the Oregon Water Resources Department (WRD or department), proposing to modify water rights evidenced by certificates 28524, 15198, 15197, and 14367 by making changes to the place of use, nature of use and points of diversion. Protests to all four applications were timely filed by protestants Water for Life (representing protestants Water for Life, Harney County Haygrowers Association, Dwight Hammond and Suzi Hammond) (hereafter referred to collectively as Water for Life) and Harney Soil and Water Conservation District (HSWCD); a protest to application T-8309 was timely filed by Andy Dunbar.

The department initiated a contested case hearing to determine whether the proposed transfers would result in injury to existing water rights. In its Notice of Hearing and Prehearing Conference dated October 9, 2000, the department phrased the issue for hearing generally as: "Whether the proposed changes as described by the transfer applications would result in injury to existing water rights." The department moved to limit the hearing issues in this matter and on March 5 and May 3, 2001, orders issued identifying the issues for hearing, with certain issues identified as legal issues to be decided on the basis of written argument prior to hearing. On August 14, 2000, an order issued with rulings on the identified legal issues.

A contested case hearing was held in this matter at the Harney County Courthouse, Burns, Oregon on August 23, 24 and 25, 2001. The applicant USFWS appeared through and with Attorney Barbara Scott-Brier. The department appeared through and with Assistant

Attorney General Sharyl Kammerzell. Protestants Water for Life, Hammond Ranches and Harney County Haygrowers Association appeared through and with attorney Brad Harper. Protestant HSWCD appeared through and with Attorney Laura A. Schroeder. Protestant Andy Dunbar appeared on his own behalf. Witnesses Bernadette Williams and Mitch Lewis testified on behalf of the department. Witnesses Robert Glaeser, Michael Eberle and Tom Downs testified on behalf of USFWS. Witness Senator Ted M. Ferrioli testified on behalf of HSWCD. Witnesses Blake Nuffer, Marvin Jess, Mitch Lewis, Steve Applegate, Andy Dunbar, William (Bill) Neal, Forest Cameron, Dwight Hammond and Steven Hammond testified on behalf of Water for Life.

The record of this proceeding, consisting of a transcript of the hearing, all evidence received, and all hearing papers filed, has been considered. The findings of fact and conclusions of law are based upon the entire record.

MOTION FOR RECONSIDERATION OF LEGAL RULINGS

Protestant HSWCD requests reconsideration of the rulings on legal issues in this matter. HSWCD retained the services of counsel immediately prior to the hearing. The sole reason given by counsel for reconsideration of the previous rulings on legal issue is HSWCD's retention of counsel. However, HSWCD had ample opportunity to retain counsel in this matter prior to the ruling on legal issues and failed to do so. Notice of this case was made in November 2000, and the hearing date was set by agreement of the parties more than three months prior to hearing. Prior to hearing, the parties identified the preliminary legal issues in this case through prehearing motion and argument and an order issued. I agreed with the Department that the issues remaining for hearing appeared to be of a factual nature. Factual issues are specifically within the scope of an authorized representative's scope of representation. *See* OAR 137-003-0555. HSWCD was capable of making an effective presentation in prehearing motions, even in the absence of counsel. To the extent that legal issues were raised later at hearing, HSWCD had the assistance of counsel and was not prejudiced in any way by the prior rulings. Accordingly, I deny the motion for reconsideration.

MOTION TO STRIKE PORTIONS OF WATER FOR LIFE'S RESPONSE

The Department moves to strike those portions of Water for Life's Response to Motion for Reconsideration of Order dated August 14, 2001 that exceed the scope of briefing allowed by this hearing officer. I agree that Water for Life's response went beyond the issues presented in the Motion for Reconsideration. In addition to addressing the issue of whether the August 14, 2001 order on legal issues should be reconsidered, Water for Life addressed legal issues and made closing argument that addressed the record produced at hearing. This additional briefing was non-responsive to the Motion for Reconsideration and I grant the Motion to Strike.

ISSUES PRESENTED

The issues in this matter were established through a May 3, 2001 Prehearing Order identifying the issues to be resolved at hearing, and specifying those issues which were legal matters to be decided by written argument prior to hearing and those issues which were factual

matters to be decided after hearing. The order identified the factual issues remaining as whether the proposed changes as described by the transfer applications would result in injury to existing water rights considering:

A. Whether the proposed transfer would result in a net loss of water available to downstream water rights.

B. Whether the water rights proposed to be transferred would be enlarged.

C. Whether the original place of use of the proposed water rights to be transferred can be prevented from receiving water from the same source.

D. Whether, due to the proposed transfers, there may be a change in the quantity of water previously available to another water right and to which the other water right is entitled.

EVIDENTIARY RULINGS

WRD Exhibits 1-14 were admitted by stipulation of the parties.

USFWS Exhibits 1-5 were admitted by stipulation of the parties; USFWS 7-A, 12-A, 13-A, 14-A, 15-A, 16-A, 17-A, 19A, 20-A, 21-A, 25-A, 26-A, 27-A, 28-A, 29-A, 31-A, 37-A, 40-A, 58-A, 59-A, 61-A, and 62-A were received without objection.

Water for Life Exhibits, B, C, D, F, I, J, K, M, N, O, Q and R were admitted by stipulation of the parties. Water for Life Exhibit E was admitted after redaction of all handwritten portions. Water for Life Exhibit A, page 1, was admitted without objection.

Dunbar Exhibits 1 and 2 were admitted without objection.

The parties stipulate that the hearing officer may take judicial notice of the Decree for the Donner und Blitzen River.

The request of Andy Dunbar to call Jim Graham, a hydrologist, as an expert witness was denied on the grounds that he was not named as a witness within the deadlines established at prehearing conference for the presentation of witness lists. A letter memorandum from James Graham was accepted into the record as an offer of proof. *See* Water for Life Offer of Proof – 1.

WRD moved to quash the subpoena for testimony by Paul Cleary, Director of the Water Resources Department. The motion was made on the grounds that Mr. Cleary was being called to testify in his role as an agency decision maker, as opposed to factual inquiry into relevant matters in dispute. *See Citizens to Preserve Overton Park v. Volpe*, 401 US 402, 422, 9 S Ct 814, 28 L Ed2d 136 (1971). I concluded that the intended line of inquiry was relevant only to the decision making processes of the witness, and with no showing that the director's decision making process was properly in dispute, the subpoena was quashed.

USFWS stipulates that it did not intend for its water right transfers, T-8309 through T-8312, to create a split irrigation duty for the irrigation sub-use of its wildlife Refuge management use of the water. USFWS further stipulates to inclusion in the transfer orders a condition precluding a split-irrigation duty for USFWS irrigation sub-use. When the USFWS designates the acreage, annually, that will be irrigated, the Service's use of the full irrigation duty at three-acre feet per acre for the irrigated acres will be assumed. The volume remaining will be available for other sub-uses under the right.

FINDINGS OF FACT

1. Transfer Application T-8309 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 28524. The dates of priority are 1872 for 16,386.5 acres, 1877 for 1109.6 acres, 1881 for 638.4 acres, 1882 for 73.3 acres, 1883 for 546.3 acres, 1884 for 140.3 acres, 1885 for 2991.4 acres, 1886 for 1102.6 acres, 1887 for 4796.1 acres, 1888 for 839.9 acres, 1889 for 1532.6 acres, 1890 for 952.6 acres, 1891 for 627.5 acres, 1892 for 90.0 acres, 1893 for 227.5 acres, 1897 for 103.8 acres, 1899 for 236.2 acres, 1901 for 37.9 acres, and 1902 for 170.1 acres. The authorized places of use for this right are listed at WRD Exhibit 6, pages 2 through 28 and are hereby adopted by reference.[1] The authorized points of diversion are listed at WRD Exhibit 6, page 2 and are hereby adopted by reference. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 815.07 cubic feet per second (cfs) prior to June 15, and 407.53 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River and its tributaries, a tributary of Malheur Lake, for irrigation of 32,602.7 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 6, pages 28 through 36, which is hereby adopted by reference.[2] USFWS proposes to add nine additional points of diversion – New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, and Dunn Dam. The locations for these points of diversion are listed at WRD Exhibit 6, pages 36 through 37 and are hereby adopted by reference.[3]

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[1] There are several hundred places of use for this right. The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 6 at pages 6 through 28 .

[2] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 6 at pages 28 through 36 .

[3] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 6 at pages 36 through 37.

2. Transfer Application T-8310 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 15198. The date of priority is 1885. The authorized places of use for this right are listed at WRD Exhibit 7, page 2 and are hereby adopted by reference.[4] The authorized point of diversion is Dunn Dam – NW ¼ SE ¼, Section 15, T 27 S, R 31 E, WM or its equivalent in case of rotation. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 2.71 cubic feet per second (cfs) prior to June 15, and 1.36 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River, a tributary of Malheur Lake, for irrigation of 108.4 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 7, pages 2 through 10, which are hereby adopted by reference.[5] USFWS proposes to add 15 additional points of diversion – New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, Page Springs Dam, Grain Camp Dam, Busse Dam, Blitzen Canal, End of Blitzen Canal, Diamond Canal, and Bridge Creek Diversion. The locations for these points of diversion are listed at WRD Exhibit 7, pages 10 through 11 and are hereby adopted by reference.[6]

3. Transfer Application T-8311 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 15197. The date of priority is 1885. The authorized places of use for this right are listed at WRD Exhibit 8, page 2 and are hereby adopted by reference.[7] The authorized point of diversion is Dunn Dam – NW ¼ SE ¼, Section 15, T 27 S, R 31 E, WM or its equivalent in case of rotation. The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 2.08 cubic feet per second (cfs) prior to June 15, and 1.04 cfs after June 15. The amount of water used for irrigation is limited to one-fortieth of one cfs per acre prior to June 15, and one-eightieth of one cfs per acre after June 15 and is further limited to a diversion of not more than 3.0 acre-feet for each acre irrigated during the irrigation season from March 15 to October 1 of each year. The right allows use of the Donner und Blitzen River,

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[4] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 7 at page 2 .

[5] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 7 at pages 2 through 10.

[6] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 7 at pages 10 through 11.

[7] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 8 at page 2 .

a tributary of Malheur Lake, for irrigation of 83.4 acres, domestic and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 8, pages 2 through 10, which are hereby adopted by reference.[8] USFWS proposes to add 15 additional points of diversion – New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek/Eastside Canal Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Krumbo Reservoir Dam, Sodhouse Dam, Dunn Dam, Grain Camp Dam, Busse Dam, Blitzen Canal, End of Blitzen Canal, Diamond Canal, and Bridge Creek Diversion. The locations for these points of diversion are listed at WRD Exhibit 8, pages 10 through 12 and are hereby adopted by reference.[9]

4. Transfer Application T-8312 was filed by USFWS on July 28, 1999, requesting a change in the use, place of use and additional points of diversion for a water right confirmed by decree of the Circuit Court of the State of Oregon for Harney County as evidenced by a portion of Certificate 14367. The right was perfected under Permit 11544 with a date of priority of September 30, 1930. The authorized places of use for this right are listed at WRD Exhibit 9, page 2 and are hereby adopted by reference.[10] The authorized point of diversion is SW ¼ SE ¼, Section 20, T31 S, R 32 ½ E, WM . The amount of water to which this right is entitled is limited to an amount actually beneficially used and not to exceed 0.28 cubic feet per second. The right allows use of Bridge Creek, a tributary of the Donner und Blitzen for irrigation of 21.4 acres and stock use. USFWS proposes to change the use to wildlife refuge management, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control. USFWS proposes to change the places of use for this right as listed in WRD Exhibit 9, pages 2 through 10, which are hereby adopted by reference.[11] USFWS proposes to add seven additional points of diversion – Bridge Creek/Eastside Canal Diversion, Sodhouse Dam, Dunn Dam, Grain Camp Dam, Busse Dam, Blitzen Canal, and End of Blitzen Canal. The locations for these points of diversion are listed at WRD Exhibit 8, pages 10 through 11 and are hereby adopted by reference.[12]

5. The Malheur National Wildlife Refuge (Refuge) is an immense area, covering over 180,000 acres. The Blitzen Valley portion covers over 65,000 acres. The management of water on the Refuge is very complex, and has always been so, even when it was a working ranch. The

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[8] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 8 at pages 2 through 10.

[9] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 8 at pages 10 through 12.

[10] The parties did not dispute the accuracy of the legal descriptions for this water right as listed in the Draft Order. *See* WRD Ex. 9 at page 2 .

[11] There are several hundred places of use proposed for this right. The parties did not dispute the accuracy of the legal descriptions as listed in the Draft Order. *See* WRD Ex. 9 at pages 2 through 10.

[12] The parties did not dispute the accuracy of the legal descriptions of these locations as listed in the Draft Order. *See* WRD Ex. 9 at pages 10 through 11.

Refuge's water is managed to meet its primary purpose as a refuge and breeding ground for migratory waterfowl and other wildlife. The Refuge uses its water to provide habitat to migratory birds and other wildlife. The habitat includes grains, grasses, wetland plants (often called emergent vegetation) and small ponds. Some commercial crops are grown on the Refuge, but such plantings are integrated in the Refuge's biological planning. Wetland plants provide a number of benefits to waterfowl, including nesting, resting, feeding, and so forth. Ponds are also necessary for wildlife species that need some amount of open water.

6. Andy Dunbar is a rancher, a portion of whose property lies at the north end of the Refuge system where the water from the Donner und Blitzen River feeds into the mouth of Malheur Lake. The main Dunbar property is approximately 400 acres and is surrounded on three sides by Refuge land. Dunbar's main water right is based on certificate 15198, with a priority date of 1889. He obtains his water from the Sodhouse Dam Diversion on the Donner und Blitzen through what is known as the Bull Ditch, which flows across Refuge Land. The Sodhouse Dam is approximately three quarters of a mile upstream from Dunbar's property line on the Donner und Blitzen River. Dunbar also has a ground water right for approximately 310 acres.

7. Dunbar receives return flows from surface water delivery systems on the Refuge. There was testimony presented from both Dunbar and Beal that if the transfer were approved and the Refuge decided not to irrigate the portions of land near Dunbar's ranch, he would not receive the return flows he normally gets through the surface water delivery systems that run by his ranch. Additionally, Dunbar testified that he receives subsurface return flows from irrigation on Refuge property. Dunbar believes that groundwater levels on his property are hydrologically connected to water levels on the Donner und Blitzen River. This belief is supported by measurements taken by Beal, which show a correlation between water levels in the river and in Dunbar's groundwater. All nine additional proposed points of diversion in Draft Final Order T-8309 are upstream from Mr. Dunbar. The applicant, after the transfer, could take all of its water or none of its water from any of the points of diversion, completely bypassing the Sodhouse Dam that Dunbar currently uses as his point of diversion. Neither certificate nor decree indicate a point of diversion for Dunbar at either Sodhouse Dam or even Bull Ditch; Dunbar's authorized point of diversion is the river. The Decree did authorize a property other than Dunbar's to use Bull Ditch as a point of diversion. Water Master Lewis testified that there is no change in water use, and no probable change in water use, that could result in harm to Dunbar.

8. Dwight Hammond is a rancher. The main portion of his ranch, the Hammond Ranches, is surrounded on three sides by Refuge land near Krumbo Reservoir. He has lived at that location since 1983. The Hammond's point of diversion is on Krumbo Creek for water rights junior to the USFWS rights. The Refuge's first point of diversion in Krumbo Creek is four miles downstream from the Hammonds' diversion. USFWS currently has no rights to irrigate the lands above Kern Reservoir (through which the Hammonds irrigate).

9. Dwight Hammond, Steve Hammond and Bill Beal have personally observed that certain tracts above Krumbo Reservoir currently proposed for transfer have neither been irrigated in the last fifteen years, are not currently capable of being irrigated, nor have they been capable of being irrigated for the last 15 years. This water right is located at Township 31 South, Range 32, Section 20 and portions of Sections 29 and 29. (Testimony of Bill Beal, Dwight Hammond and

Steve Hammond; WRD Ex. 5-6).

10. Mitch Lewis works for WRD, in the Field Services Division. He is the Watermaster for District 10, which includes all of the Malheur-Wright Basin and a portion of the Malheur River Basin. In this role he performed an injury review of these proposed transfers. His finding was that the proposed transfers may be made without injury.

11. Robert Glaeser is a co-owner of Minister and Glaeser Surveying. He is a licensed professional surveyer and Certified Water Rights Examiner in the State of Oregon. In 1994 he was hired to prepare maps for the USFWS to accompany the transfer applications for certificates 28524, 14367, 15197, and 15198. As part of the mapping process, he first employed aerial photographic mapping. These photographs were used to prepare preliminary base maps that were then used to do a field survey of actual water use at the Refuge. The field survey was accomplished by examining the aerial photographs to determine which areas had historically received water at the Refuge. Those areas which had not received water were excluded from the final transfer maps. Also excluded were areas covered by roads, canals, levies and rivers and some areas that showed on the photographs as open water. The accuracy of the maps was checked by a ground survey in 1995. After consultation with the USFWS, it was determined that certain areas that appeared to be open water in aerial photos were actually irrigated Refuge lands, not open water.

12. Michael Eberle is a Supervisory Hydraulic Engineer employed by the USFWS regional office in Portland, Oregon. In this role he is responsible for the protection and acquisition of water rights for the region, including the Refuge. He is familiar with the Refuge's use of water and its rights under the Donner und Blitzen Decree. He was responsible for the research that determined that many areas identified as open water during the initial aerial surveys taken for preparation of the transfer maps were in fact areas that had been irrigated at least once every five years for the last 15 years. In particular, he determined that many areas identified as "ponds" or open water were managed on a habitual drain and fill cycle with the object of producing aquatic habitat containing the appropriate vegetation for migrating waterfowl. Some ponds are filled and drained annually, others may be filled for several years before being drained out. He determined that all areas that were drained to the level that they produced emergent plant vegetation were irrigated lands. He has reviewed the transfer maps accompanying this transfer application and believes that they accurately reflect the actual areas irrigated on USFWS land within the Refuge.

13. Tom Downs is a USFWS employee who has worked at the Refuge since 1984. He is currently employed as a work leader (field work supervisor) who oversees various projects throughout the Refuge. He has also been employed as a maintenance mechanic irrigator and equipment operator at the Refuge since 1984. These duties have made him familiar with the entire irrigation system utilized within the Blitzen Valley portion of the Refuge. He affirms the accuracy of the transfer maps submitted with these transfer applications. The transfer maps, with one exception discussed below, accurately reflect the actual areas irrigated on USFWS land within the Refuge. In particular, he affirms the irrigation of ponds throughout the Refuge for purposes of emergent vegetation management in support of wildlife. He is familiar with Refuge practice of cyclically filling and draining ponds for this purpose and confirms that it has been the

Refuge's regular practice for ponds throughout the Refuge.

14. Blake Nuffer worked for the USFWS at the Refuge in 1985 through 1986 and again from 1989 through 1992. He observed various locations proposed for transfer under water at the time he worked there, but did not observe any ponds for a five-year-period. He was not familiar with the Refuges biological management plans while he worked there and did not understand the management of land for the production of emergent plants to be irrigation.

15. Marvin Jess was employed at the Refuge from 1962 through 1993, primarily as a crane operator. He has identified numerous ponds and land tracts within the Refuge as not "irrigated", but recognized that they were managed for the production of emergent vegetation or wildlife habitat, a usage he did not consider to be irrigation.

16. William (Bill) Neal is retired after serving for 21 years as the Watermaster in District 10, which covers all of Harney County, part of Malheur County, part of Grant County, and part of Lake County. He has identified numerous ponds and land tracts within the Refuge as not used for irrigation, but acknowledged that he had no direct knowledge of whether they were managed for the production of emergent vegetation or wildlife habitat.

17. In order to promote plant growth and nourish plants, the Refuge has a complex "moist soil management practice." The Refuge uses some water to irrigate fields for farm crops. The Refuge also irrigates native grasses, only some of which is mowed and hayed. The Refuge also irrigates marshes and wetland areas, some of which have shallow standing water on a regular basis. The Refuge uses ponds as part of its biological plan. Most ponds are shallow and dense in emergent vegetation. The Refuge drains all of its ponds in a regular cycle with the intent to promote emergent plant growth as part of its biological plan. Water use in ponds and wetlands at the Refuge varies depending on their current cycle from being completely dry, to a mere sheen of water on the surface, to several feet of water. At all stages the water is being artificially applied to promote plant growth and create wildlife habitat.

18. The Grain Field area has been irrigated on a regular basis for 20 years.

CONCLUSIONS OF LAW

A. The proposed changes as described by the transfer applications will not result in injury to existing water rights through a net loss of water available to downstream water rights.

B. A portion of the water rights to be transferred has been shown to be subject to exclusion from transfer for non-use. After excluding the portion of the water rights for which non-use is established, the proposed changes as described by the transfer applications will not result in injury to existing water rights through enlargement of the water rights proposed to be transferred.

C. The proposed changes as described by the transfer applications will not result in injury to existing water rights. The original place of use of the proposed water rights to be transferred can be prevented from receiving water from the same source.

D. The proposed changes as described by the transfer applications will not result in injury to existing water rights, due to the proposed transfers, through a change in the quantity of water previously available to another water right and to which the other water right is entitled.

OPINION

The Malheur National Wildlife Refuge is a unique water user with unusual needs. The Refuge is an immense area, covering over 180,000 acres with the Blitzen Valley portion alone (that portion of the Refuge involved in this transfer) covering over 65,000 acres. The water rights in dispute are proposed for transfer from lands within the Blitzen Valley that cover a lesser portion of the Blitzen Valley (approximately 33,000 acres) for use on the Refuge's entire Blitzen Valley holdings. The management of water on the Refuge is very complex, and has always been so, even when it was a working ranch. The Refuge's water has been consistently managed, however, to meet its primary purpose as a Refuge and breeding ground for migratory waterfowl and other wildlife. The Refuge uses its water to provide habitat to migratory birds and other wildlife. The habitat includes grains, grasses, wetland plants (often called emergent vegetation) and small ponds. All of those uses are part of meeting the Refuge's purposes. Even though some commercial crops are grown, even these provide food, cover or other benefits to wildlife. For instance, some grasses are hayed in order to promote new growth, while other grasses are left standing. Again, when grains are grown and harvested, some grain is left for the wildlife. Additionally, wetland plants provide a number of benefits to waterfowl, including nesting, resting and feeding. Ponds are also necessary for wildlife species that need some amount of open water.

The Refuge describes these transfers as seeking three changes to clarify to the public that what it is doing is in fact irrigation, even though it believes its current water usage qualifies as irrigation under its existing certificates. These changes are:

1) A change in the character of use from "irrigation, domestic and stock" to "wildlife Refuge management" including specified sub-uses described in the application.

2) The addition of points of diversion. The size of the Refuge requires that many points of diversion be used in order to spread the water by flood irrigation.

3) A change in the place of use to all of the lands within the Blitzen Valley portion of the Refuge. The existing place of use is approximately 33,000 acres of the approximately 65,000 acres of land within the Blitzen Valley portion of the Refuge.

JURISDICTION

HSWCD argued at hearing that WRD lacked jurisdiction under ORS 536.310(1) because the draft permits, WRD Exs. 6,7, 8 and 9, make an impermissible change in use from "irrigation, domestic and stock" to "wildlife refuge management etc." While WRD objected that this was a

legal issue that had been determined prior to hearing, I allowed argument and the presentation of evidence on this issue. I now find that WRD was correct in characterizing this issue as determined prior to hearing. In the August 14, 2001 Ruling on Legal Issues I found that the proposed use's incorporation of "sub uses" is valid under Oregon law . The Department argued persuasively that existing law contains several examples of "beneficial uses" incorporating "sub uses" which are, to some extent, open ended. There is no legal support for protestants' argument that the Department may not adopt a water use definition that incorporates other uses. HSWCD also argued that the proposed change from a rate and duty appurtenant to an acre to a "global rate and duty that can be applied anywhere in an area globally described by section" is not within the jurisdiction of the WRD. I agree with WRD that this issue was properly raised during the pre-hearing stage of this hearing and may not be readdressed.

INJURY - DUNBAR

The protestants argue that the evidence produced at hearing demonstrates that injury will occur if the proposed transfer is approved. Pursuant to OAR 690-015-0050, a transfer shall not result in injury to existing water rights. The rule states:

> (1) A transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right. Injury shall include the following:
>
> (a) A transfer would result in a net loss of water available to downstream water rights; or
>
> (b) The water right to be transferred would be enlarged.
>
> (2) An injury to an existing water right or an enlargement of the water right to be transferred shall be determined to result from, but is not limited to, the following:
>
> (a) A change reducing the quantity of water previously available to another water right and to which the other water right is entitled;
>
> (b) A diversion of more water than is specified as a rate of flow or duty of water per acre for the subject water right; or
>
> (c) Under a change in place of use, the original place of use cannot be prevented from receiving water from the same source.

Protestants argue that Andy Dunbar will be injured if the transfer is approved because he will not receive return flows to his property from the applicant's land, both surface flows and groundwater flows, that he feels he has a right to. Dunbar testified that he receives return flows from surface water delivery systems on the Refuge. There was testimony presented from both Dunbar and Water Master Beal that that if the transfer went through and the Refuge decided not to irrigate the portions of land near Mr. Dunbar's ranch, he would not receive the return flows he normally gets through the surface water delivery systems that run by his ranch. Additionally, Dunbar testified that he receives subsurface return flows from irrigation on Refuge property. If

the Refuge were to change its management style they could move water entirely away from Mr. Dunbar's property and he would no longer receive those subsurface flows.

The protestants also point to the testimony of Andy Dunbar, supported by measurements of Water Master Beal, that groundwater levels on Dunbar's property are hydrologically connected to levels on the Donner und Blitzen. They argue that changes in operations could result from the transfer that will affect Dunbar, with potential injury due to a hydrological connection between Dunbar's well and the Donner und Blitzen River. They argue that there was persuasive testimony from both Beal and Dunbar that there is a connection between the two that has not been properly examined in determining whether there is the potential for injury.

Finally, protestants point out that Dunbar has water rights that have senior, equal and junior priority dates to the applicant's various rights. Because the applicant can move those priority dates around under the proposed order, Dunbar feels they could be "used against him." Dunbar believes he will be injured because applicant will be adding nine points of diversion to its currently recognized seven points of diversion. All of these points of diversion are upstream from Mr. Dunbar and none are controlled by a rate. The applicant, after the transfer, could take all of its water or none of its water from any of the points of diversion, bypassing the Sodhouse Dam that Dunbar currently uses completely if it chose to do so. Thus, the transfer would hypothetically allow the applicant to either flood or dry up the land contiguous to his. In either case, he believes that it would be injurious to his ability to obtain water of his own that he has a right to. He also believes that the proposed transfer, by adding diversion points above his, could reduce the quantity of water previously available by allowing the applicant to divert water, even all the water, currently available to him. He notes that the transfer process would recognize a historical diversion point, Sodhouse Dam, as a point of diversion for the applicant, disregarding Dunbar who has had a historical use of the diversion point. Because he has no written agreement with the applicant that the historical delivery point will continue, he fears that he will be injured.

I find the argument of WRD and USFWS persuasive that the protestants have not shown injury to Dunbar as a result of this transfer; rather, the preponderance of evidence in this case shows that there is no injury. Injury is not a vague notion or speculation of enlargement. The transfers proposed will be limited to the rate, duty and season of the original rights. And they will be further limited by stipulation of the applicant to prevent splitting a duty of acres annually designated for irrigation. The new right will not allow any more rate or duty, any more water, than the original right. The allegation that Dunbar's wells will be injured is purely speculative and unsupported by any evidence. While Dunbar has testified that his well is hydrologically connected to the river, there is no reason to believe that both will not continue to receive water. While Dunbar may currently benefit from sub-surface and return flows when USFWS irrigates its lands, that is not a legal entitlement or part of Dunbar's legal water right. The preponderance of evidence in the record indicates that Dunbar will continue to receive the amount of water to which he is legally entitled, from his authorized sources, both surface and ground water.

USFWS characterizes all of the protestants' problems as originating from the fact that their rights are junior to most of the Refuge's rights. I agree. The protestants have simply not shown how these transfers will lessen the amount of water in the river to which Dunbar has a legal right. Dunbar's main concern is the continued permissive use the USFWS has given him

for his diversion from Sodhouse Dam. In regard to the addition of Sodhouse Dam as a point of diversion, USFWS correctly points out that neither the certificates nor decree indicate a point of diversion for Dunbar at either Sodhouse Dam or Bull Ditch. The Decree did authorize a property other than Dunbar's to use Bull Ditch as a point of diversion, but Dunbar's authorized point of diversion is the river. His claims regarding access to his point of diversion are simply not a question of injury, but a property matter that is not within the jurisdiction of this hearing. Finally, Eberle testified that USFWS intends to continue to operate the Refuge in a historically similar manner. Water Master Lewis, aware of this intent, testified that there is no change in water use, and no probable change in water use, that could result in harm to Dunbar. Physically, it simply cannot happen because his property lies at the north end of the system where the water feeds into the mouth of Malheur Lake.

Injury - Hammonds

Water for Life points out that applicant currently has no rights to irrigate the lands above Kern Reservoir (through which the Hammonds irrigate). *See* WRD Ex. 5 at 14. If the applications go through without application of normal appurtenancy requirements, argues Water for Life, USFWS could move their rights upstream of the Hammonds, from anywhere on the Refuge. It would be a senior water right to the tributaries of the Donner und Blitzen River. USFWS would then be able to divert water into Krumbo Reservoir and place a call on the water the Hammonds are diverting into Kern Reservoir.

As to the Hammonds, USFWS and WRD again argue persuasively that the Hammond's point of diversion is on Krumbo Creek for water rights junior to the USFWS rights. That point of diversion is well upstream of the Refuge's first point of diversion in Krumbo Creek, four miles downstream from the Hammonds, and would remain so after the transfer because the Refuge has not applied for a diversion to be added above the Hammonds' water right. If the Refuge wanted to apply for such an upstream point of diversion, they would have to go through another transfer process like this one. WRD argues that Hammonds are upstream, junior water users to the applicant. No point of diversion of the applicant will be transferred above the Hammond's point of diversion, as illustrated by the draft orders, and therefore there will be no injury.

NON-USE AS ENLARGEMENT

In my ruling on legal issues, I found that the proposed transfer applications as presented to the department were not in error or deficient because applicant's evidence of historical use of the water rights proposed for transfer is insufficient. Pursuant to ORS 540.520(2)(g), an application to change the use, place of use or point of diversion of a water right shall include "evidence that the water has been used over the past five years according to the terms and conditions of the owner's water right certificate." By departmental rule such evidence may include affidavits from knowledgeable persons, such as the owner or user of the water right. OAR 690-15-060(12). For each application before me, applicant submitted an affidavit by an employee, Forrest Cameron, attesting to historic use of water on the subject lands. (Department's Opening Brief, Exhibit 1). In its pre-hearing argument on legal issues, Water for Life contended that the application's evidence of historical water use was so cursory and lacking

in detail that it did not "suffice" as evidence under the statutory standard. (Water for Life Response Brief at 5). In my ruling on legal issues, I found that the applicant's evidence of water use meets the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) and was sufficient to establish historic use of the water. I found in favor of the Department on this issue.

Nevertheless, while the application and supporting affidavits were sufficient to withstand attack as a legal issue prior to hearing, they remain subject to rebuttal by the protestants at hearing. Here, the protestants have presented persuasive evidence that a portion of the applicant's representation of historical water use at the Refuge was inaccurate. The protestants have phrased this non-use as a question of enlargement and suggest that the transfer should be denied to prevent enlargement. While considering this matter following hearing, I transmitted the following question to the department pursuant to OAR 137-003-00635:

> In the absence of a pending water right cancellation proceeding pursuant to ORS 540.631, does proof by a preponderance of evidence presented at hearing demonstrating that a portion of the water right sought to be transferred has not been used in the past five years according to the terms and conditions of the owner's water right certificate or is subject to forfeiture under ORS 540.610 demonstrate an enlargement under OAR 690-015-050 and injury pursuant to ORS 540.530?

The department has responded with the following discussion, which I adopt as my own:

> The application requirements and standard of review for a water right transfer application are set out in ORS 540.505 to ORS 540.580 and OAR Chapter 690 Division 15. Under ORS 540.520(2)(g), a transfer application must include:
>
> > Evidence that the water has been used over the past five years according to the terms and conditions of the owner's water right certificate or that the water right is not subject to forfeiture under ORS 540.610.
>
> *See also* OAR 690-015-0060(12)(giving examples of the types of evidence that may be submitted to show use of the water right). Thus, a transfer applicant may show either that the subject water rights have been used over the past five years, or that, if the water rights have not been used, they are not subject to forfeiture under ORS 540.610, which sets out several exceptions to forfeiture.
>
> A transfer application that meets all of the application criteria is reviewed to determine whether the proposed transfer will cause injury to existing water rights. ORS 540.520(7). ""Injury to an existing water right" means a proposed transfer would result in a water right not receiving the water to which it is legally entitled." OAR 690-015-0005(5). Examples of injury set out in rule include enlargement.

(1) A transfer application shall not be approved if the proposed transfer would result in the injury of an existing water right. Injury shall include the following:

(a) A transfer would result in a net loss of water available to downstream water rights; or

(b) The water right to be transferred would be enlarged.

(2) An injury to an existing water right or an enlargement of the water right to be transferred shall be determined to result from, but is not limited to, the following:

(a) A change reducing the quantity of water previously available to another water right and to which the other water right is entitled

(b) A diversion of more water than is specified as a rate of flow or duty of water per acre for the subject water; or

(c) Under a change in place of use, the original pace of use cannot be prevented from receiving water from the same source.

OAR 690-015-0050. If a proposed transfer can be made without injury to existing water rights, then the application shall be approved. ORS 540.530(1).

Based on the above criteria and standards, the Hearing Officer has asked whether proof that a portion of the water rights sought to be transferred have not been used within the past five years and are not otherwise exempt from forfeiture, necessarily demonstrates an enlargement under OAR 690-015-050 and injury pursuant to ORS 540.530. This question presumes that a portion of the water rights sought to be transferred fail to meet a necessary requirement for a transfer application. Under ORS 540.520(2)(g), a transfer application must include evidence that the water has been used over the past five years or that it is not subject to forfeiture under ORS 540.610.

If a preponderance of the evidence in a transfer proceeding record demonstrates that a portion of the water right transferred has not been used over the past five years in accordance with the conditions of the certificate and are not otherwise exempt from forfeiture, then the water rights for which non-use has been established cannot be transferred. ORS 540.510 provides that a water right may be transferred "upon compliance with the provisions of ORS 540.520 and 540.530[.]" Because water rights for which evidence of nonuse has been established fail to comply with a specific statutory provision, they may not be transferred. Thus, whether the proof of non-use also demonstrates enlargement

and injury is irrelevant. It is not necessary to reach this second level of inquiry for water rights that fail to comply with the initial application requirements.

*****

[T]he Department proposes that the Hearing Officer exclude from the requested transfer any portion of the water rights sought to be transferred that, based on a preponderance of evidence in the record, has not been used in the past five years according to the terms and conditions of the owner's water rights certificate and is not otherwise exempt from forfeiture under ORS 540.610. Because transfer applications that meet the statutory requirements and that will not result in injury to existing water rights must be approved, only the portion of the water rights for which non-use is established are subject to exclusion from the transfer order, assuming that the transfer of the remaining portion will not result in injury to existing water rights.

Applying the department's statement of the applicable law to the facts determined at hearing, I find that the protestants have shown that water rights for certain tracts above Krumbo Reservoir that are currently proposed for transfer have neither been irrigated in the last fifteen years, nor are they capable of being irrigated. The testimony of Bill Beal, Dwight Hammond and Steve Hammond was persuasive that the water rights possessed by USFWS above Krumbo Reservoir, specifically identified at hearing, have never been irrigated and cannot be irrigated due to the lack of a functional water delivery system. This water right is located at Township 31 South, Range 32, Section 20 and portions of Sections 29 and 29. *See* WRD Ex. 5-6. As pointed out by protestants, there was no rebuttal to those assertions, and no contrary evidence or testimony. Thus, having "not been used in the past five years according to the terms and conditions of the owner's water rights certificate and *** not otherwise exempt from forfeiture under ORS 540.610," the water rights appurtenant to these tracts of land do not meet the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) and they may not be transferred. ORS 540.510. Only the portion of the water rights for which non-use is established are subject to exclusion from the transfer order, as I have found that transfer of the remaining portion will not result in injury to existing water rights.

Protestants have also alleged that numerous other acres are subject to forfeiture. They point to the testimony of Lewis, Nuffer, Jess, Beal, Steve Hammond, Dwight Hammond and Downs as supporting the conclusion that many of the acres proposed for transfer were either abandoned or forfeited by the applicant through inconsistent use or certificated storage of water overlaying the land. For instance, Beal testified that Boca Pond covers several sections and many acres overlying acres proposed for transfer and if they are underneath Boca Pond, they cannot be transferred. *See* WRD Ex. 5-7. Steve Hammond testified that several acres in Knox Pond are similarly not eligible because constantly under water. *See* WRD Ex. 5-7. Dwight Hammond testified that the Grain Field area had not been irrigated in more than 20 years. Nuffer and Jess listed multiple ponds and impoundments where they believed water has been stored on top of acres that are now proposed for transfer by the applicant. Protestants argue that any water right on these acres has been abandoned and cannot be transferred because it is subject to cancellation; to do otherwise would allow them to recover those acres and enlarge their water right.

I agree with WRD and USFWS that with the exception of the lands above Krumbo Reservoir mentioned above, protestant's enlargement argument is focused on conclusions not supported by record. The majority of the nonuse alleged by the protestants is associated with ponds. In essence, protestants are arguing that storage and irrigation cannot coexist. The patterns of water use at the Refuge simply don't fit protestant's traditional model of irrigation that would require a pond to be completely evacuated, tilled, seeded and irrigated in order for "irrigation" to take place. However, in order to promote and nourish emergent plant growth, the Refuge has instituted a complex "moist soil management practice." The Refuge does use some water to irrigate fields for traditional farm crops such as alfalfa and grain. But, the Refuge also irrigates to create marshes and wetland areas, some of which remain almost constantly under shallow water. The Refuge also irrigates native grasses, only some of which are mowed and hayed. The Refuge uses ponds. Most of these are shallow and dense in emergent vegetation. The Refuge also drains ponds with the intent to promote new plant growth. Throughout the Refuge, the water is artificially applied to promote plant growth and create wildlife habitat.

The department has promulgated an administrative rule defining "irrigation" to mean:

> [T]he artificial application of water to crops or plants by controlled means to promote growth or nourish crops or plants. Examples of these uses include, but are not limited to, watering of an agricultural crop, commercial garden, tree farm, orchard, park, golf course, play field or vineyard and alkali abatement. OAR 690-300-0010(26).

The department argues that this definition of irrigation does not require storage and evacuation, use of farm equipment, and seeding. Because water is artificially applied at the Refuge with a clear intent to nourish plants as part of the overall Refuge biological and water management plan, it constitutes irrigation. Downs testified credibly that all of the ponds inquired about had been evacuated at least three or four times in the last 15 years as part of the Refuge's biological management of these ponds. To lawfully undertake such activities, it is necessary to have both consumptive and storage rights, both of which USFWS possesses for the land in dispute.

USFWS' irrigation activity is consistent with the department's interpretation of irrigation as defined by its own administrative rule. The court has previously explained that the department's interpretation of this rule is entitled to great deference:

> The department's interpretation of that rule is subject to highly deferential review. As long as the interpretation of an agency's own administrative rule is plausible, we are not at liberty to reject it. *Don't Waste Oregon Committee v. Energy Facility Siting Council*, 320 Or 132, 142-43 (1994). In this case, petitioners do not explain why the department's interpretation is implausible, only that they disagree with it. *Staats v. Newman*, 164 Or App 18, 24 (1999)

Protestants also argue that the department's order in *Orchard Water Company* mandates that a storage right or use forfeits or abandons the irrigation use. However, I find that on the

facts shown here, there is no conflict. The department has found that the Refuge's repeated use of shallow, overlying water was an irrigation use with the intent to promote plant growth for wildlife use. While protestants argue that in order to sustain irrigation water rights on land underlying storage there needs to be an evacuation of water and application of water to a crop in order to meet the irrigation purpose, I find the department's argument that the rule is not in conflict with past case law both plausible and persuasive. *See, e.g., Hennings v. Water Resources Dept.*, 50 Or App 121 (1981) where the court defined irrigation as the "operation of causing water to flow through lands to nourish plants." *See also, McCall v. Porter*, 42 Or 49 (1902), which requires an actual diversion of the water from the natural channel, an intent to apply it to a beneficial use, and the actual application to the use designed. As stated by the *Staats* court, "petitioners do not explain why the department's interpretation is implausible, only that they disagree with it." *Staats* at 24.

PROPOSED ORDER

I propose that the Department issue the following order:

The Draft Orders in T-8309, T-8310, T8311, T8312 (WRD Exs. 6-9) should issue with the following exclusions.

The water rights possessed by USFWS above Krumbo Reservoir at Township 31 South, Range 32, Section 20 and portions of Sections 29 and 29, should be excluded from transfer.

IT IS SO ORDERED.

DATED this 10th day of June, 2002.

Paul Vincent, Hearing Officer
Hearing Officer Panel

NOTICE OF OPPORTUNITY FOR ADMINISTRATIVE REVIEW FOR TRANSFER CASES

This Proposed Order is issued by the hearing officer pursuant to OAR 137-003-0645. As provided in OAR 137-003-0650 and OAR 690-002-0170, any party to this proceeding or the Department may file exceptions to this proposed order with the Oregon Water Resources Commission. The exceptions must be in writing and received at the Water Resources Department no later than 30 days after the date of service (the date served according to the certificate of service) of this proposed order. You must also send a copy of your exceptions to any other party or parties to the contested case hearing. Send any exceptions to:

Oregon Water Resources Department
158 12th Street NE
Salem, OR 97301

Exceptions are legal or factual arguments illustrating legal or factual error in the proposed order, as demonstrated by the record. Evidence not in the record may not be offered in exceptions. Exceptions must clearly and concisely identify the portion(s) of the proposed order excepted to, and cite to appropriate portions of the record or Commission policies to which modifications are sought in the exceptions.

If exceptions are filed, any party or the Department may respond to the exceptions. The Department must receive responses no later than 10 days after the date of service of the exceptions. An opportunity may be provided for making additional written or oral argument to the Commission, at the Commission's determination and discretion. After reviewing the record, the exceptions and any additional argument, the Commission will issue a final order. The Commission may issue a final order that differs from the Proposed Order or it may adopt the Proposed Order as the Final Order.

If exceptions are not filed within the allowed period, the Director will issue a Final Order.

CERTIFICATE OF SERVICE

RE: U.S. Fish and Wildlife Service Transfer Application T-8309, 8310, 8311, 8312

I HEREBY CERTIFY that I have made service of copies of the foregoing PROPOSED ORDER upon the following parties by causing to be mailed in the United States Post Office at Salem, Oregon, on the 10th day of June, 2002, a certified true, exact and full copy thereof, enclosed in an envelope with postage thereon prepaid, addressed to:

Adam Sussman
Oregon Water Resources Department
158 12th Street NE
Salem OR 97301

Andy Dunbar
HCR 72 Box 200E
Princeton OR 97721

Brad Harper
Water for Life Inc
PO Box 12248
Salem OR 97309-0248

Laura Schroeder
Harney Soil & Water Conservation Dist
1915 NE 39th Avenue
Portland OR 97212

Sharly Kammerzell
Oregon Dept of Justice
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1162 Court Street NE
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Barbara Scott-Brier
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Jo Ellen Odle

Jo Ellen Odle, Hearings Technician
Hearing Officer Panel

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130

May 18, 2001

Paul Vincent, Hearing Officer
Hearing Officer Panel
P.O. Box 14020
Salem, Oregon 97309-4020

VIA HAND DELIVERY

RE: Department's Opening Brief on Legal Issues - In the Matter of the Protest Against Transfer Applications T-8309, 8310, 8311, and 8312.

Dear Mr. Vincent:

Attached please find the Department's Opening Brief on Legal Issues in this matter.

Respectfully submitted,

Adam Sussman
Agency Representative

cc: parties
Sharyl Kammerzell

STATE OF OREGON
BEFORE THE HEARING OFFICER PANEL
FOR THE OREGON WATER RESOURCES DEPARTMENT

In the Matter of the Protests Against Water Transfer Applications T-8309, 8310, 8311, 8312	)	
United States Fish And Wildlife Service, *Applicant*	)	DEPARTMENT'S OPENING BRIEF ON LEGAL ISSUES
Harney County Soil & Water Conservation Dist. Andy Dunbar Water for Life Hammond Ranches, Inc. Dwight & Susan Hammond Harney County Haygrowers Association *Protestants*	)	

INTRODUCTION

On July 28, 1999, the U.S. Fish and Wildlife Service (Applicant) submitted transfer applications T-8309, 8310, 8311 and 8312. The four applications propose to modify portions of the water rights evidenced by water right certificates 28524, 15198, 15197 and 14367 by making changes to the place of use, nature of use and points of diversion. Collectively, the applications propose to transfer over 32,000 acres of irrigation water rights to "wildlife refuge management" for use within the boundaries of the Malheur Wildlife Refuge. Protests to all four applications were timely filed by Harney Soil and Water Conservation District. Timely protests were also filed by Water for Life, Inc., Harney County Haygrowers Association and Dwight and Suzie Hammond (collectively Water for Life). Andy Dunbar timely filed a protest to application T-8309.

Pursuant to a November 16, 2000, Order on Prehearing Conference, the parties provided written argument on the identity of issues to be resolved at hearing. On March 5, 2001, the

Hearing Officer issued an order identifying two main issues with associated sub-issues for hearing. On May 3, 2001, the Hearing Officer issued an order adding sub-issue 2K, identifying issues 2A through 2K as legal issues that can be decided on written argument, and setting a schedule for briefing the legal issues.

Pursuant to the schedule set out in the May 3, 2001, order, the Department submits this opening brief on legal issues 2A through 2K. In its protest Water for Life asserts that the transfer applications are in error or deficient and should be dismissed (hearing issues 2A - 2K). As argued below, Water for Life is misguided. The requested transfers are permissible and the transfer applications meet the applicable legal requirements. The arguments raised by Water for Life are without merit. There is no genuine issue as to any material fact for issues 2A through 2K and the Department is entitled to a ruling as a matter of law. OAR 137-003-0580. Accordingly, the Department requests a ruling in its favor on these issues.

ARGUMENT

I. Standard of Review

OAR 137-003-0580 provides that a hearing officer shall grant a motion for ruling on legal issue if 1) the pleadings, affidavits and supporting documents and the record in the contested case show that there is no genuine issue as to any material fact that is relevant to resolution of the legal issue as to which a decision is sought, and 2) the agency or party filing the motion is entitled to a favorable ruling as a matter of law.

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II. Transfer Applications T-8309, 8310, 8311 and 8312 Are Not In Error or Deficient (Hearing Issue 2)

A. The proposed use is a permissible beneficial use. (Issue 2A)

Protestant Water For Life argues that "wildlife refuge management" is not a beneficial use because this use is not enumerated in the Department's statutes or rules as a beneficial use. (WFL Protest at 4). Whether or not a use is enumerated in statute and rule is not determinative of whether a use is beneficial. The determination of whether a use is beneficial is based on the beneficial use criteria. "Wildlife refuge management" satisfies the criteria for beneficial use.

"Beneficial use" is the "basis, the measure and the limit of all rights to the use of water in this state." ORS 540.610. "Beneficial use" is defined as "the reasonably efficient use of water without waste for a purpose consistent with the laws, rules and the best interests of the people of the state." OAR 690-300-010(5). Although the Department's rules identify many specific beneficial uses, beneficial uses **are not** limited to those uses enumerated by Department rules. The limit on whether a use is beneficial is whether the use is reasonably efficient, and is for a purpose that is consistent with the laws, rules and best interests of the people of the state. *Id.*

The proposed use of the water in Transfer Applications T-8309, 8310, 8311, and 8312 is for "wildlife refuge management," which includes wildlife,[1] aquatic life,[2] wetland

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[1] " 'Wildlife Water Use' means the use of water by or for sustaining wildlife species and their habitat." OAR 690-3-010(62).

[2] " 'Aquatic Life Water Use' means the use of water to support natural or artificial propagation and sustenance of fish and other aquatic life." OAR 690-300-010(3).

enhancement,[3] riparian area enhancement,[4] fire control,[5] domestic,[6] irrigation,[7] stockwater,[8] recreation,[9] construction, and dust control.[10] Each of these sub-uses is to be practiced in a manner consistent with the overall purpose of the water use which is "wildlife refuge management."

Although the use of water for "wildlife refuge management" is not specifically defined by the Department's rules, the use is consistent with the beneficial use definition in OAR 690-300-010(5), and other related statutes. The beneficial use definition looks to the purpose of the use. Here, the purpose of the use "wildlife refuge management" is further refined by reference to numerous sub-uses, all of which are recognized beneficial uses. OAR 690-300-010. Moreover, the legislature, in the interests of the people of the state, has declared that "wildlife" and "fish" uses are beneficial uses, and encourages wetland and riparian uses. ORS 536.300, 537.015. As

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[3] " 'Wetland Enhancement Water Use' means the use of water to restore, create, or enhance or maintain wetland resources." OAR 690-300-010(61); *see also* ORS 537.015 and 537.017 (encouraging use).

[4] " 'Stream or Riparian Area Enhancement Water Use' means the use of water to restore or enhance a stream or riparian area." OAR 690-300-010(51).

[5] " 'Fire Protection Water Use' means the use and storage of water for the purpose of extinguishing fires or reducing the potential outbreak of fires." OAR 690-300-010(17).

[6] " 'Domestic Water Use' means the use of water for human consumption, household purposes, domestic animal consumption that is ancillary to residential use of the property or related accessory uses." OAR 690-300-010(14).

[7] " 'Irrigation' means the artificial application of water to crops or plants by controlled means to promote growth or nourish crops or plants. Examples of these uses include, but are not limited to, watering of an agricultural crop, commercial garden, tree farm, orchard, park, golf course, play field or vineyard and alkali abatement." OAR 690-300-010(26).

[8] " 'Stockwater Use' means the use of water for consumption by domesticated animals and wild animals held in captivity as pets or for profit." OAR 690-300-010(46).

[9] " 'Recreation Water Use' means the use of water for play, relaxation or amusement. Examples of these uses include, but are not limited to, boating, fishing, wading, swimming, and scenic values." OAR 690-300-010(43).

[10] Water use for road construction, maintenance and road watering are recognized beneficial uses that may require a permit. ORS 537.040.

demonstrated by the recognized sub-uses and the legislative declarations recognizing fish, wildlife, wetland, and riparian uses, the use of water for "wildlife refuge management" is consistent with the statutes and rules regarding permissible beneficial uses.

Water For Life also argues that wildlife refuge management is not a beneficial use because it is not a use that is enumerated under ORS 537.170(8). (WFL Protest at 6). This argument confuses the public interest determination for a water right application, which considers whether a use is appropriate, with the concept of beneficial use, which is determinative of whether a use is permissible. Not only is ORS 537.170 inapplicable to the beneficial use inquiry, it is inapplicable to a transfer application, which does not consider the public interest.

ORS 537.170 sets out factors that the Department considers when determining whether a use proposed in an *application* for a new water use permit is in the public interest or whether the public interest has been overcome. ORS 537.170(8)(a) sets out a non-exclusive lists of beneficial uses. The statute does not define or otherwise limit what may be determined to be a beneficial use. Moreover, the statute, by its terms, only applies to water right applications. There is no merit to Protestant's argument that "wildlife refuge management" is an impermissible beneficial use because it is not enumerated in ORS 537.170(8)(a).

In short, the use of water for "wildlife refuge management" is consistent with the laws, rules and best interests of the people of the state and is not otherwise prohibited by statute or rule.

B. Applicant's evidence of historical use of the water rights proposed for transfer meets the applicable legal requirements under ORS 540.520(2)(g) and OAR 690-15-060. (Issue 2B)

Under ORS 540.520(2)(g), an application to change the use, place of use or point of diversion of a water right shall include "[E]vidence that the water has been used over the past

five years according to the terms and conditions of the owner's water right certificate[.]" Such evidence may include affidavits from knowledgeable persons, such as the owner or user of the water right. OAR 690-15-060(12). Water for Life contends that Applicant's evidence of historical use of the water rights proposed for transfer is insufficient because: (1) the historical use evidence is confined to the Blitzen Valley, (2) it is unclear what portion of the water rights are being referenced, and (3) it does not establish in sufficient detail the beneficial use. (WFL Protest at 5). This argument misrepresents the legal requirements for an application.

For each application, Applicant submitted an affidavit by long-time refuge employee Forrest Cameron, attesting to historic water use. (Exhibit 1). The affidavits speak for themselves -- Mr. Cameron has knowledge of and is familiar with the subject lands (commonly referred to as the Blitzen Valley portion of the wildlife refuge), water use on the subject lands and the subject water rights. To the best of Mr. Cameron's knowledge, the transfer application maps submitted with applications T-8309, 8310, 8311 and 8312 accurately represent that portion of the authorized place of use (the water rights proposed for transfer or "from land") ***irrigated*** during the past five years under water right certificates 14367, 15197, 15198 and 28524. Applicant is not required to show evidence of historic use for the portion of the water rights not proposed for transfer. Applicant's evidence of historical water use is clearly and correctly in reference to that portion of the water rights proposed for transfer. Moreover, contrary to Water for Life's unsupported counter argument, Applicant's evidence of water use meets the legal requirements set out in ORS 540.520(2)(g) and OAR 690-15-060(12) and is sufficient to establish historic use of the water.

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C. The water rights proposed for transfer are "subject to transfer." (Issue 2C)

Water for Life, relying on ORS 540.510(1) and OAR 690-15-040, argues that the water rights proposed for transfer are not "subject to transfer" because the original rights are not being fully extinguished in favor of the new rights. In other words, Applicant is not "drying up" the "from" lands in favor of the "to" lands. (WFL Protest at 6). This argument confuses legal concepts and is without legal support.

As an initial matter, "water use subject to transfer" is a legal term that defines what authorized water uses may be transferred. ORS 540.505(4). Among the uses that may be transferred is a water use established by court decree or a water use established by a water right certificate. ORS 540.505(4)(a)(b). All water uses proposed for transfer under applications T-8309, 8310, 8311 and 8312 were established either by a court decree or a water right certificate and as a matter of law are "water uses subject to transfer."

Protestant's argument seems to be that the instant water rights are not "subject to transfer" because the "from" lands are not going to be dried up. This argument, irregardless of the misuse of terminology, mis-interprets the applicable rule. Applicant seeks to modify portions of water rights (the "from" lands) by changing the place of use, nature of use and points of diversion. The resulting water right would be for "wildlife refuge management" for use within the boundaries of the Malheur Wildlife Refuge (the "to" lands). The proposed transfers do not propose to "dry up" the "from" lands in favor of the "to" lands; nor is there a legal requirement to do so. Under OAR 690-15-040, approval of a change in use or place of use terminates the right to use water for the ***existing use or place of use under the original water right***. In other words, the ***original*** water right is no longer available for use on the "from" lands. However, the statues and administrative rules do not prohibit Applicant from exercising the "transferred" or

"new" water right on the "from" lands. In other words, nothing prohibits a transfer Applicant from "picking up" a water right, modifying it in some way, and placing it back on the same lands for a "different" use. Applicant's proposed new place of use is in accord with the controlling transfer law.

D. The subject transfer applications meet the application requirements under ORS 540.520(2) and OAR 690-15-060. (Issue 2D)

Applications to change the use, place of use or point of diversion of a water right must meet the application requirements under ORS 540.520(2) and OAR 690-15-060. Among other things, the application requirements require information regarding the type of change requested, the source of water, the authorized place of use, the proposed use and the proposed place of use. OAR 690-15-060.

Water for Life argues that in order to properly determine the extent of injury to other users of the same water source, there must be greater specificity as to Applicant's proposed use and its relation to return flows. Water for Life suggests that the Department *should* require additional information. (WFL Protest at 6). Protestant's suggestion underscores the purpose of this contested case, which is to further develop the factual record for the purpose of determining whether the transfer will result in injury. The applications contain the required information under ORS 540.520(2) and OAR 690-15-060 and as a matter of law are not deficient. To the extent that Water for Life desires to expand upon the information submitted with the application, it may do so in the hearing.

E. Approving the sources of water for proposed transfer T-8309 as the Donner und Blitzen River and its tributaries is not an enlargement of the original water rights. (Issue 2E)

In transfer application T-8309, Applicant proposes to modify the use, place of the use and points of diversion for a portion of the water rights evidenced by certificate 28524. In the

application, Applicant indicates that the source of water for the water rights evidenced by certificate 28524 is the Donner und Blitzen River and its tributaries. (Exhibit 2). Water for Life asserts that Applicant's reference to the tributaries of the Donner und Blitzen as the authorized source of water amounts to enlargement of its existing water rights and suggests that the application should be rejected or limited. (WFL Protest at 6). The Department disagrees. The stated source of water is consistent with the Donner und Blitzen Decree, which adjudicated these rights, and for that reason does not amount to an enlargement of the existing water rights.

In a transfer application, it is unlawful to add sources of water that are not already authorized under the original water right. ORS 540.520. Such an addition would be considered an "enlargement" of the original water right. That is not the case here. The subject water rights for application T-8309 are evidenced by certificate 28524. (Exhibit 3). These water rights (uses) all pre-date the 1909 Oregon water code, and therefore were adjudicated by the State Engineer and subsequently confirmed by decree of the Circuit Court of the State of Oregon for Harney County (Donner und Blitzen Decree or Decree). *See* ORS ch. 539 (setting out the process for adjudicating vested, pre-1909 water rights). The Decree for these water rights is recorded in the Order Record of the State Engineer in Volume 13, at page 508. (Exhibit 4). Certificate 28524 is a summary of the water use confirmed by the court. Read together, the Decree and the supporting record, including the State Engineer's Findings and Order of Determination, and the adjudication maps, make it clear that the water rights (uses) evidenced by certificate 28524 authorized use of the Donner und Blitzen River and its tributaries.

The tabulation in the Decree indicates that the "stream" for the water rights evidenced by certificate 28524 is the Donner und Blitzen River. However, it also indicates, under "name of ditch," seven specific ditches and a blanket reference to natural sloughs, channels and dams.

(Exhibit 4 at 10). According to the State Engineer's Findings and Order of Determination, these listed ditches divert and carry water to the subject lands from sources that are tributaries of the Donner und Blitzen River. For example, Bridge Creek Canal "diverts water from Bridge Creek and sloughs from the Blitzen River." The Diamond Canal "diverts water from McCoy, Cucamonga, and Kiger Creek." (Exhibit 5 at 4, which is an excerpt of the State Engineer's Findings and Order of Determination, from Order Record of the State Engineer Volume 12, pgs. 513-612).

Even more telling are the State Engineer's maps prepared as part of the adjudication and referenced in the Decree. These maps show numerous ditches diverting and conveying "tributary" water to lands evidenced by certificate 28524. Exhibit 6 is two of ten maps prepared by the State Engineer for the adjudication and is provided as an example. According to the Decree, these maps show "with substantial accuracy the course of said stream and its tributaries, the location of each ditch or canal diverting water there from and the number of acres of land which have been irrigated in each legal subdivision, blue prints of said maps and plats now being on file ***and a part of the record herein."*** (Exhibit 4 at 2, emphasis added).

A review of the Decree and the adjudication record clarifies that the court confirmed water rights, now evidenced by certificate 28524, that allow the use of the Donner und Blitzen River **and** its tributaries. Applicant's request under Application T-8309, is not asking to "add" sources of water to the original water right and is not an enlargement.

F. The proposed transfers to wildlife refuge management is lawful - it will not allow Applicant to use water without regard to appurtenancy, rate and duty requirements, timing, priority of use or place of use. (Issue 2F)

Water for Life argues that the proposed transfers would allow Applicant to use water "wherever, whenever and in whatever condition it deems fit, without regard to appurtenancy, rate

and duty requirements, timing, priority of use, or place of use." (WFL Protest at 7). Water for Life's statement is unsupported and inaccurate.

In four separate applications (T-8309, 8310, 8311 and 8312), Applicant proposes to modify portions of water rights evidenced by four water right certificates (28524, 15198, 15197 and 14367). Each of the four applications proposes to change the place of use, nature of use and points of diversion for the "original right." Collectively, the applications would change over 32,000 acres of irrigation water rights to "wildlife refuge management" within the boundaries of the Malheur Wildlife Refuge.

Approval of the proposed transfers will not give Applicant the authority to use water in the "carte blanc" manner suggested by Water for Life. A water right is characterized by its type of use, place of use (appurtenancy), priority date, season of use, source of water, point of diversion and amount of water. Under ORS 540.520, an Applicant can make changes only to a water right's use, place of use and point of diversion. Contrary to Protestant's assertions, applications T-8309, 8310, 8311, and 8312, (submitted under ORS 540.520) do not propose to change priority dates, authorized amounts of water (rate and duty) and seasons of use. Any order approving any of the four transfer applications will retain the priority date, the amount of water authorized for use under that priority date (rate and duty or total volume) and the season of use for the "original right." Water for Life's unsupported assertions regarding "rate and duty requirements, timing, and priority" simply are wrong.

Regarding appurtenancy (place of use), Applicant has lawfully requested to make changes to the place of use of the original water rights. If approved, the proposed "wildlife refuge management" water use would remain appurtenant to the place of use proposed in the applications and approved by the Commission's order. ORS 540.510(1). As a matter of law,

approval of the proposed transfers would not give Applicant authority to use water without regard to appurtenancy. Nor would such approval allow Applicant to use water as it "deems fit." Water use under the approved transfers would be limited by the terms and conditions of the approval order and, like all rights to the use of water in the state, be limited to beneficial use. ORS 540.610(1).

G. The proposed use is not an illegal application for an instream water right. (Issue 2G)

Protestant Water For Life argues that inasmuch as the proposed use includes "aquatic life" and "riparian enhancement," it is an instream use. As such, the transfer must comply with the statutes and rules regarding instream water rights. Because, under the instream statutes, Applicant is not authorized to hold an instream water right, the transfer application must be denied. (WFL protest at 7).

Contrary to Protestant's assertions, this is not an application for a transfer to an instream water right. The transfer is for a proposed use separate and distinct from an instream use. Thus, although Applicant is not authorized to acquire an instream water right, that issue is of no import, because the transfer is not for an instream water right. ORS 537.332; ORS 537.341.

An in-stream water right is defined as:

> [A] water right held in trust by the Water Resources Department for the benefit of the people of the State of Oregon to maintain water in-stream for public use. An in-stream water right does not require a diversion or any other means of physical control over the water." ORS 537.332(3).

Instream water rights are "held in trust by the Water Resources Department for the benefit of the people of the State of Oregon." ORS 537.332(3). Instream water right certificates are issued in the name of the Department as trustee for people of the state of Oregon. ORS 537.341. A water right for a use other than instream may be transferred to an instream water right, subject to the transfer provisions in ORS 540.505 to 540.580 and to the instream water right provisions in ORS 537.332 through 537.354. ORS 537.348. Once transferred, the instream right is held in trust by the Department for the people of Oregon to maintain water instream for public use.

As an initial matter, this is not an application for a new water right, but an application to transfer an existing water right. To the extent that Protestant is claiming that this is an impermissible application for a new instream water right, there is no basis for such a claim. Nor is there any basis for a claim that this is an impermissible transfer to an instream water right. As discussed above, this transfer is for a permissible beneficial use, which use is distinct from an instream water right. Not all water rights that benefit a stream system are instream rights. Oregon law recognizes that, in addition to instream use, there are other beneficial uses to which water may be put that benefit the stream system but that do not amount to an instream water right. *See* ORS 536.300 (recognizing wildlife and fish life as beneficial uses) OAR 690-310-010(3) and (51) (defining aquatic life and riparian enhancement as distinct beneficial uses)

The beneficial use for which Applicant has applied for is not the equivalent of an instream right. There is no basis to deny the transfer applications on the ground that it would grant an unauthorized instream right.

H. Approval of the proposed transfers will not result in an impermissible waiver of state forfeiture provisions. (Issue 2H)

Protestant Water for Life argues that approving a transfer for use of "wildlife refuge management" will exempt the water right from forfeiture provisions because the vague and ill-defined nature of the water right will allow the water right holder to claim use of the water under any circumstances. In effect, claims Protestant, this will create a *de facto* federal reserved water right. (WFL Protest at 8). This water right transfer neither effects a waiver of the forfeiture provisions nor creates a *defacto* federal reserved water right.

Protestant's assertion that the proposed water right transfer would effect an exemption from the forfeiture provisions of state water law is based on hyperbole rather than law. In essence, Protestant is arguing that because the proposed use is so consistent with the purposes of the refuge the water always will be used, and this is inconsistent with the concept of forfeiture,

which contemplates a period of non-use. Protestant's argument, while underscoring the benefit of the proposed use, fails to establish that the proposed use waives the forfeiture provisions in ORS 540.610. In fact, the argument demonstrates that the use is wholly consistent with the underlying concept of water law – that 'beneficial use shall be the basis, the measure and the limit of all rights to the use of water in this state." ORS 540.610(1). Water rights are granted with the expectation that they will be put to use, not with the expectation or requirement that they undergo periods of non-use. Whether or not a water right is used, all perfected and developed water rights remain subject to the forfeiture provisions in ORS 540.610. Granting a water right permit that will be used in the period and manner described in the permit does not effect an impermissible waiver of the forfeiture provisions.

Nor does granting a water right for a use that is consistent with the needs and purposes of the overlying federal land designation turn the water right into a federal reserved water right. The water rights that are the subject of the transfer application were acquired under the state appropriation system. A federal reserved water right must stem from a federal act reserving public lands. *See Winters v. United States*, 207 US 564 (1908) (stating that when the federal government reserves a part of the public domain for a particular purpose, it impliedly also reserves sufficient unappropriated water to effectuate that purpose); *Cappaert v. United States*, 426 US 128 (1976) (explaining federal reserved water right doctrine and applying it to Devil's Hole National Monument).

A federal agency acquiring a water right through a state appropriation system can not turn the right into a federal reserved right. *See generally* Waters and Water Rights, Beck Ed., vol. 4, at 218 and chapters 36 and 37 (1996) (describing federal-state water relations and federal reserved rights doctrine -- reserved rights are unlike prior appropriation rights, "the chief

characteristic of reserved rights is that they are federal rights, grounded on the [mostly implied] intent of the federal government to reserve water for its purposes"). There is no legal support for the claim that use of water under the requested permit by a federal agency would turn the water right into a federal reserved water right.

I. Applicant does not need consent from another federal landowner in order to make the applications complete. (Issue 2I)

Water for Life mistakenly asserts that U.S. Bureau of Land Management (BLM) is a "co-Applicant" and should be required to submit an affidavit demonstrating approval of the proposed transfers. None of the four transfer applications identify the BLM as the "deeded owner" of the lands to which the water rights are appurtenant." OAR 690-15-060 (13). In the instant case, consent from another landowner is not required - the changes proposed are only to water rights where the Applicant is the deeded owner of the land to which the water right is appurtenant. As a matter of law, the applications are complete.

J. The proposed use is not subject to Harney County's land use laws. (Issue 2J)

Protestant Water For Life asserts that the transfer applications must be denied because the "applications are incomplete due to the absence of evidence of compliance with Harney County's land use laws." (WFL Protest at 8). To the extent that Protestant is arguing that the Department has failed to comply with its land use information requirements, this argument fails. To the extent that Protestant is arguing that irregardless of the land use coordination requirements the application must comply with local land use laws this argument also fails. The Department has complied with its land use information requirements and the local land use laws are not binding on the Malheur National Wildlife Refuge.

The Department's land use information requirements stem from the requirement that state agency permitting decisions be made in compliance with statewide planning goals and

compatible with acknowledged local government comprehensive and land use regulations. ORS 197.180(1). Agencies may comply with the compliance and compatibility requirements of ORS 197.180(1) by adopting and implementing a state agency coordination program that is consistent with ORS 197.180(3), and that is certified by the Department of Land Conservation and Development under ORS 197.180(4),(5) and (6).

DLCD certified the Department's State Agency Coordination ("SAC") Program on December 20, 1990. The SAC Program consists of a guidance document, *Land Use Planning Procedures Guide ("Guide")*, and administrative rules set forth in OAR chapter 690 division 5. The Department's coordination and compatibility obligations with respect to water right transfers are described in Section III, Subsection IX (pp. 71-72) of the *Guide* and in OAR 690-05-025 to 690-05-055(1) (Exhibit 7). The rules provide that where the subject activity affects federal agencies the Department shall take actions "described in its [Guide]." OAR 690-05-055. For land use coordination with federal agencies, the *Guide,* in Section IV, provides that "[a]pplications for water uses on federally owned lands are not subject to land use information requirements as are other applications." (Exhibit 8). The Department has acted consistent with this direction and consistent with the land use information requirement.

The rules and the Guidance document reflect overriding principles of federal law, which provide that Congress has plenary power to legislate the use of federal lands and that federal law passed pursuant to the Property Clause of the United States Constitution, Article IV, section 3, clause 2, overrides any contrary state law. *Kleppe v. New Mexico*, 426 US 529 (1976). Absent specific and unambiguous federal legislation applying state and local regulations to federal activity on federal lands, local land use laws are not binding on federal lands. *Environmental Protection Agency v. California ex. rel. State Water Resources Control Board,* 426 US 200

(1976). Protestant has made no claim that there is specific legislation applying state and local regulations to the Refuge, nor is there any basis in federal law for such a claim. Harney County's local comprehensive plan does not control the USFWS's management of the Malheur National Wildlife Refuge.

K. It is permissible to place a transferred water right on lands that have an existing water right. (Issue 2K)

In its Reply dated April 20, 2001, and at the pre-hearing conference on April 27th, 2001, Water for Life argued that Applicant is prohibited from placing a transferred water right on lands that have an existing water right. Water for Life is wrong. There is no legal basis to support Water for Life's assertion.

Over 7,000 acres of the water rights evidenced by certificates 28524, 15198, 15197 and 14367 will not be modified by the proposed transfers. *See* Department's Response to Motion to Suspend Proceedings, submitted April 18, 2001 (explaining water rights at issue). Unless otherwise canceled, a new certificate, called a remaining right certificate, will be issued to "cover the unaffected portion of the water right." ORS 540.530(2). Since Applicant's transferred water right would allow use within the refuge boundaries, in theory, Applicant could use water on lands that already have an existing water right (remaining right). Such "stacking" of water rights is not prohibited. The only requirement in such a case is that, if the water rights are for the *same* type of use, the user may need to designate one of the "stacked rights" as a supplemental right. OAR 690-15-045; (*see also* OAR 690-15-005(10) (defining supplemental water right). Here, the "stacked" water rights would be for different uses. There is no legal prohibition to placing a transferred water right on lands with an existing water right. To the contrary, the Department has worked with agricultural interests to place transferred water rights on lands with existing water rights to provide additional water or to create new uses such as nursery or cranberry operations.

Once again Water for Life is misguided and in this case argues against its members own interests.

CONCLUSION

The above arguments demonstrate that there is no basis for denying the applications based on the arguments made by Protestant and identified in issues 2A through 2K. The application is complete as a matter of law and the proposed transfers are consistent with the identified underlying principles of water law. Accordingly, the Department respectfully requests a ruling in its favor on the above legal issues.

DATED this 18 day of May, 2001.

Respectfully submitted,

HARDY MYERS
Attorney General

Sharyl L. Kammerzell, #95316
Assistant Attorney General
Of Attorneys for Water Resources Department

Adam Sussman, Agency Representative
Water Resources Department

CERTIFICATE OF SERVICE

I certify that on May 18th, 2001, I mailed by U.S. mail postage prepaid a copy of this DEPARTMENT'S OPENING BRIEF ON LEGAL ISSUES to:

Brad Harper
Water for Life, Inc.
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Barbara Scott-Brier
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Portland, Oregon 97232
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And delivered by hand to:

Paul Vincent, Hearing Officer
Hearing Officer Panel
P.O. Box 14020
Salem, Oregon 97309-4020
(503) 373-0380
FAX (503) 378-4067

Janet Halladey
Janet Halladey
Water Resources Department

STATE OF OREGON

COUNTY OF HARNEY

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

W.J. DUNN
NARROWS, OREGON

confirms the right to use the waters of the DONNER UND BLITZEN RIVER, a tributary of MALHEUR LAKE, for IRRIGATION OF 1230.85 ACRES, DOMESTIC AND STOCK.

This right was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County. The decree is of record at Salem, in the Order Record of the WATER RESOURCES DIRECTOR, in Volume 13, at Page 508. The dates of priority are 1885 for 56.6 acres, 1887 for 236.20 acres, 1897 for 253.12 acres, 1904 for 39.97 acres, 1906 for 160.44 acres, 1907 for 161.46 acres, 1908 for 123.51 acres, 1909 for 79.76 acres, 1910 for 39.79 acres, and 1911 for 80.00 acres.

The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed ONE-FORTIETH OF A CUBIC FOOT PER SECOND PRIOR TO JUNE 15, AND ONE-EIGHTIETH OF A CUBIC FOOT PER SECOND PER ACRE AFTER JUNE 15, WITH A TOTAL LIMITATION OF THREE ACRE FEET PER ACRE FROM MARCH 15 TO OCTOBER 1, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

DUNN DAM - NW¼ SE¼, SECTION 15, T 27 S, R 31 E, W.M..

A description of the place of use to which this right is appurtenant is as follows:

1885

NE¼ SE¼	16.20 ACRES
NW¼ SE¼	6.30 ACRES
SW¼ SE¼	16.10 ACRES
SE¼ SE¼	18.00 ACRES

SECTION 15
TOWNSHIP 27 SOUTH,
RANGE 31 EAST, W.M.

1887

NE¼ NE¼	40.00 ACRES
LOT 1	36.20 ACRES

SECTION 32

SW¼ NE¼	40.00 ACRES
SE¼ NE¼	40.00 ACRES
NE¼ NW¼	40.00 ACRES
SE¼ NW¼	40.00 ACRES

SECTION 33
TOWNSHIP 26 SOUTH,
RANGE 31 EAST, W.M.
SOUTH OF MALHEUR LAKE

1897

LOT 1 (SW¼ SW¼)	2.00 ACRES

SECTION 28

LOT 1 (NE¼ NE¼)	7.10 ACRES
LOT 2 (SE¼ NE¼)	42.67 ACRES
LOT 7 (SE¼ NW¼)	7.77 ACRES
SE¼ SE¼	40.00 ACRES

SECTION 32

LOT 1 (NW¼ NW¼)	24.53 ACRES
LOT 2 (NW¼ SW¼)	33.77 ACRES
LOT 3 (SW¼ SW¼)	34.74 ACRES
LOT 4 (SE¼ SW¼)	12.38 ACRES
LOT 5 (SW¼ SE¼)	14.26 ACRES
LOT 6 (SE¼ SE¼)	33.90 ACRES

SECTION 33
TOWNSHIP 26 SOUTH,
RANGE 30 EAST, W.M.

1904

LOT 11 (NW¼ NW¼)	39.97 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1906

LOT 5 (SW¼ NW¼)	42.89 ACRES
LOT 4 (NW¼ SW¼)	37.55 ACRES

SECTION 3

SE¼ NE¼	40.00 ACRES
LOT 7 (NE¼ SE¼)	20.75 ACRES
LOT 1 (NE¼ SE¼)	19.25 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1907

SW¼ NE¼	40.00 ACRES
SE¼ NW¼	40.00 ACRES
LOT 5 (NE¼ SW¼)	41.84 ACRES
LOT 6 (NW¼ SE¼)	39.62 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1908

LOT 6	(NE¼ SW¼)	20.88 ACRES
LOT 5	(SE¼ SW¼)	42.35 ACRES
LOT 3	(NE¼ SE¼)	42.49 ACRES
LOT 4	(SW¼ SE¼)	17.79 ACRES

SECTION 32
TOWNSHIP 26 SOUTH,
RANGE 30 EAST, W.M.

1909

LOT 9	(NW¼ NE¼)	39.85 ACRES
LOT 10	(NE¼ NW¼)	39.91 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1910

LOT 8	(NE¼ NE¼)	39.79 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1911

LOT 1	(NE¼ NE¼)	40.00 ACRES
LOT 2	(NW¼ NE¼)	40.00 ACRES

SECTION 5
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

This certificate describes that portion of the water right confirmed by Certificate 15197, State Record of Water Right Certificates, NOT modified by the provisions of an order of the Water Resources Director entered _____, approving Transfer Application 8311.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in said decree.

WITNESS the signature of the Water Resources Director,

affixed _____.

_____
Paul R. Cleary, Director

Recorded in State Record of Water Right Certificates numbered #####.

Court—209—12-43

STATE OF OREGON

COUNTY OF HARNEY

CERTIFICATE OF WATER RIGHT

This Is to Certify, That W. J. Dunn

of Harrows, State of Oregon, has a right to the use of

the waters of Donner und Blitzen River

for the purpose of Irrigation, domestic and stock

and that said right has been confirmed by decree of the Circuit Court of the State of Oregon for Harney County, and the said decree entered of record at Salem, in the Order Record of the STATE ENGINEER, in Volume 13, at page 508; that the priority of the right thereby confirmed dates from (See below)

$(83.4)(3) = 250.2$ $\frac{83.4}{40} = 2.08$ $\frac{83.4}{80} = 1.04$

that the amount of water to which such right is entitled, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed one-fortieth of a cubic foot per second per acre prior to June 15, and one-eightieth of a cubic foot per second per acre after June 15, with a total limitation of three acre feet per acre from March 15 to October 1, measured at the point of diversion from the stream.

A description of the lands irrigated under such right, and to which the water is appurtenant (or, if for other purposes, the place where such water is put to beneficial use), is as follows:

PRIORITY	NO. OF ACRES	PLACE OF USE
1897	253.12	2 acres Lot 1 ($SW\frac{1}{4}$ $SW\frac{1}{4}$) Section 28, 7.1 acres Lot 1 ($NE\frac{1}{4}$ $NE\frac{1}{4}$) 42.67 acres Lot 2 ($SE\frac{1}{4}$ $NE\frac{1}{4}$) 7.77 acres Lot 7 ($SE\frac{1}{4}$ $NW\frac{1}{4}$) 40. acres in $SE\frac{1}{4}$ $SE\frac{1}{4}$ Section 32, 24.53 acres in Lot 1 ($NW\frac{1}{4}$ $NW\frac{1}{4}$) 33.77 acres Lot 2 ($NW\frac{1}{4}$ $SW\frac{1}{4}$) 34.74 acres Lot 3 ($SW\frac{1}{4}$ $SW\frac{1}{4}$) 12.38 acres Lot 4 ($SE\frac{1}{4}$ $SW\frac{1}{4}$) 14.26 acres Lot 5 ($SW\frac{1}{4}$ $SE\frac{1}{4}$) 33.9 acres Lot 6 ($SE\frac{1}{4}$ $SE\frac{1}{4}$) Section 33, T. 26 S., R. 30 E., W. M.
1887	236.20	40 acres in $SW\frac{1}{4}$ $NE\frac{1}{4}$ 40 acres in $SE\frac{1}{4}$ $NE\frac{1}{4}$ 40 acres in $NE\frac{1}{4}$ $NW\frac{1}{4}$ 40 acres in $SE\frac{1}{4}$ $NW\frac{1}{4}$ Section 33, 40 acres in $NE\frac{1}{4}$ $NE\frac{1}{4}$ 36.20 acres in Lot 1 Section 32, T. 26 S., R. 31 E., W. M. South of Malheur Lake.
1904	39.97	39.97 acres Lot 11 ($NW\frac{1}{4}$ $NW\frac{1}{4}$) Section 4 T. 27 S., R. 30 E., W. M.
1906	160.44	42.89 acres in Lot 5 ($SW\frac{1}{4}$ $NW\frac{1}{4}$) 37.55 acres in Lot 4 ($NW\frac{1}{4}$ $SW\frac{1}{4}$) Section 3, 40 acres in $SE\frac{1}{4}$ $NE\frac{1}{4}$ 20.75 acres in Lot 7, ($NE\frac{1}{4}$ $SE\frac{1}{4}$) 19.25 acres in Lot 1, ($NE\frac{1}{4}$ $SE\frac{1}{4}$) Section 4, T. 27 S., R. 30 E., W. M.

15197 T 8311

PRIORITY	NO. OF ACRES	PLACE OF USE
1907	161.46	40 acres in SW¼ NE¼ 40 acres in SE¼ NW¼ 41.84 acres in Lot 5, (NE¼ SW¼) 39.62 acres in Lot 6, (NW¼ SE¼) Section 4, T. 27 S., R. 30 E., W. M.
1908	~~123.21~~ 133.51	20.88 acres in Lot 6, (NE¼ SW¼) 42.35 acres in Lot 5, (SE¼ SW¼) 42.49 acres in Lot 3, (NE¼ SE¼) 17.79 acres in Lot 4, (SW¼ SE¼) Section 32, T. 26 S., R. 30 E., W. M.
1909	79.76	39.85 acres in Lot 9, (NW¼ NE¼) 39.91 acres in Lot 10, (NE¼ NW¼) Section 4, T. 27 S., R. 30 E., W. M.
1910	39.79	39.79 acres in Lot 8, (NE¼ NE¼) Section 4, T. 27 S., R. 30 E., W. M.
1911	80	40 acres in Lot 1, (NE¼ NE¼) 40 acres in Lot 2, (NW¼ NE¼) Section 5, T. 27 S., R. 30 E., W. M.
1885	140	16.2 40 acres in NE¼ SE¼ – 33.8 6.3 40 acres in NW¼ SE¼ – 33.7 16.1 40 acres in SW¼ SE¼ – 23.9 18.0 20 acres in SE¼ SE¼ – 2.0 Section 15, T. 27 S., R. 31 E., W. M.

56.6 93.4

1314.25
1230.85

And said right shall be subject to all other conditions and limitations contained in said decree. The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 20th *day of* August *, 19* 47

CHAS. E. STRICKLIN
State Engineer

Recorded in State Record of Water Right Certificates, Volume 13, *page* 15,197

BEFORE THE OREGON WATER RESOURCES DEPARTMENT

State of Oregon)
) ss
County of Harney)

Affidavit Asserting
Nonuse of Water Right

I, Nevin Thompson of 53743 Hwy. 78, Burns, State of Oregon, 97722 (541 493 2450), say:

1. Water right certificate #15234, 28524, (T8309), issued to U. S. Department of the Interior, Malheur National Wildlife Refuge, authorizes water from Donner und Blitzen River & tributaries to be used for irrigation & livestock watering under assigned priority dates.
2. The water right is appurtenant to a total of approximately 1,600 acres, within Malheur National Wildlife Refuge, which is located in Township 28, Range 31, EWM, in the Sections 7, 8, 16, 17, 18, 19, 20, 21, 25, and 36, in Harney County, and marked with pink cross-hatch accordingly on the enclosed map #2 of eight..
3. I am a Harney County Rancher and have lived in Harney County most of my life. I am familiar with these lands and am aware of the nonuse of this water right because I was instrumental in the haying and grazing management of these and neighboring lands for the past 15 years and passed by or through these lands regularly.
4. I am here asserting that I know from my own personal observations and state with certainty that a portion of this water right has not been used for irrigation for a period of more than 5 years.
5. I have illustrated in (Pink cross hatching) on the attached copy of Water Resources Department Transfer Application map of Harney County, Oregon; Certified Water Right Examiner; 11/19/91; State of Oregon; hand dated underneath 7/22/99 sent by Water Resources Department, in regards to this cancellation.
6. I have read the provisions of ORS 540.610(2) and OAR 690-17-800 and believe that the presumption of forfeiture for five or more years of nonuse cannot and will not be rebutted by the holder of this water right, and believe further that none of the grounds described therein for rebutting the presumption of forfeiture can be demonstrated by the holder of the water right. ✓
7. As a proponent of the cancellation of this water right, I am willing and prepared to testify in a contested case hearing to all allegations contained in this affidavit, and will do so in the event a contested case hearing is scheduled by the Water Resources Department. I understand that as proponent, I have the burden to prove the nonuse as alleged by a preponderance of the evidence, and that if the Department determines that I have not met my burden of proof, the water right will not be cancelled. ✓

Under penalty of perjury, I swear or affirm that the foregoing is a true statement of the facts, as I know them to be from my personal knowledge.

Nevin Thompson
Nevin Thompson

Subscribed and sworn to before me this 29th day of April 2003.

Susan A Hammond
Susan A. Hammond, Notary Public
My Commission expires: 8/25/04

OFFICIAL SEAL
SUSAN A. HAMMOND
NOTARY PUBLIC-OREGON
COMMISSION NO. 335147
MY COMMISSION EXPIRES AUG. 25, 2004

COPY T-8311

State of Oregon
WATER RESOURCES DEPARTMENT

RECEIVED
JUL 2 * 1999
WATER RESOURCES DEPT
SALEM, OREGON

APPLICATION FOR TRANSFER OF WATER RIGHT

Applicant: **U.S. Fish and Wildlife Service**

Mailing Address: **911 NE 11th Avenue**

Portland	**Oregon**	**97232-4181**	**(503) 231-6251**
(City or town)	(State)	(Zip)	(Phone)

Type of Change: **place of use; use heretofore made of the water**
(in point of diversion; place of use; use heretofore made of the water)

1. **WATER RIGHT**

A) Is the water right in your name? **YES** (YES, NO) If not, list name below:

B) Was the water right determined by a court decree? **YES** (YES, NO)

1. If yes, list the title of the proceedings: **In the matter of the Determination of the Relative Rights to the Use of the Waters of Donner und Blitzen River and its Tributaries, a Tributary of Malheur Lake, No. 3355 (Circuit Court, Harney County, Oregon)**
2. Certificate No: **15197** ✓

C) Was the water right acquired by a water permit? **NO**
1. If yes, list the Permit No: **N/A**

D) Date of priority right: **1885** ✓ ,19____

E) What are your reasons for the proposed changes?
To better reflect Malheur National Wildlife Refuge's water needs.

F) The water will be completely applied to the proposed use on or before: **Immediately** , 19 ____

2 **LOCATION OF AUTHORIZED USE**

A) What is the source of the water (river, stream, well)? **Donner und Blitzen River** ✓

B) Describe the authorized point of diversion: Need POD changes?

Location in Reference to Survey Corner	¼,¼ of Section	Section	Township	Range
2527 ft West, 1436 ft North of the SE Corner of Section 15	**NWSE** ✓	**15** ✓	**27 S** ✓	**31 E** ✓
~~Hardman Slough~~ Dunn Dam				

C) What is the name of the ditch used? **Carevari Ditch**

D) What is the use to which the water is applied? **Irrigation, domestic, and stock**

E) Give the location of the authorized area irrigated or place of use other than for irrigation:

Township	Range	Section	¼,¼ of Section	Number of acres irrigated
27 S	**31 E**	**15**	**NWSE**	**33.7**
27 S	**31 E**	**15**	**SWSE**	**23.9**
27 S	**31 E**	**15**	**NESE**	**23.8**
27 S	**31 E**	**15**	**SESE**	**2.0**

F) Is the land within an irrigation district? Yes ____ No **X** ✓
If Yes, which district?

G) County **Harney** ✓

3. **LOCATION OF PROPOSED USE:**
Note: Answer question A **only** if the application is for a change in the point of diversion.

A) Describe the proposed point of diversion:

Location in Reference to Survey Center	¼,¼ of Section	Section	Township	Range
N/A				

NOTE: Answer questions B, C, D, and E **only** if the application is for a change in use or place of use.

B) Are the lands from which you propose to transfer your water right free of all encumbrances? **YES** (Yes, No)

C) If no, give the description below of existing encumbrances:

Encumbrance	Held by	Amount
N/A		

D) What is the use to which the water will be applied? **Wildlife refuge management: Uses include, but are not limited to wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock water, recreation, construction, and dust control**

E) Give the proposed location of the area irrigated, or place of use if other than for irrigation:

Township	Range	Section	¼,¼ of Section	No. of acres irrigated
Please see Attachment C				

4. **EXHIBITS**
The following exhibits **shall** be attached to and made part of the application:

A) A **map** prepared by a certified water right examiner showing the location of the present and proposed points of diversion, the authorized and proposed places of use and, if any, lands from the existing right that would not be subject to transfer.

B) A copy of the current recorded **deed** to the subject lands.

C) **Affidavits** from any other landowners or encumbrance holders with interest in the original water right stating that they have no objection to the proposed transfer.

D) **Evidence** that the water has been used within the last five years.

5. **Name and Address of Receiving Landowners(s)** If other than applicant:
N/A

6. **REMARKS: None**

I (we), Paul Rauch, Agent for U.S. Fish and Wildlife Service applicants, hereby swear that I (we) have read the above application for transfer of water right and that the statements made are true and correct. Dated and signed this 27th day of July ,19 99.

(Signature)

(Signature)

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

9-13-99

INTEROFFICE MEMO

TO: Larry Nunn
FIELD PROCESSOR WORKING ON THIS TRANSFER

DATE: 9-20-99

FROM: X WATERMASTER, DISTRICT # 10
~~GROUNDWATER SECTION~~

(SIGNATURE) Mitch Jenni

SUBJECT: **WATER RIGHT TRANSFER #** 8311

A change in: **POU** **POD** **POA** **USE** of water.

In the name(s) of U S Fish & Wildlife.

In my opinion ~~(assuming the right is valid)~~, the proposed change

MAY BE MADE WITHOUT INJURY WOULD RESULT IN INJURY* to an existing water right.

*The approval of this transfer application would result in injury to other water rights because_____

The existing right may not be valid because _____

Headgate notices HAVE HAVE NOT Been issued for diversion from the source(s)which serve(s) this right.

If for change in point of diversion, is there any intervening point(s) for diversion between the authorized and proposed points of diversion? (Yes or No) _____

In my opinion, the order approving the subject transfer application should include the following in regard to the appropriator installing suitable measuring devices in the diversion works:

✓ (1) PRIOR to the diverting of water at the new point of diversion . . .

_____ (2) WHEN IN the judgement of the watermaster it becomes necessary . . .

The enclosed copy of the transfer application and map(s) is for your records.

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

August 2, 1999

Wayne Bowers
Oregon Department of Fish and Wildlife
P.O. Box 8
Hines, OR 97738

Reference: Transfer # **8311**

Enclosed for your review is a copy of a water right transfer application from **DONNER und BLITZEN RIVER**, tributary of **MALHEUR LAKE**.

Consistent with the Oregon Plan, we are soliciting your input on whether the proposed transfer would injure an instream water right or any other water right in which ODFW has an interest. If you believe that the transfer would injure a water right, please describe the nature of the injury and provide any supporting information which you have available.

This transfer is not for a permanent or historic change in a point of diversion. Therefore, the provisions of ORS 540.525 and 540.532 related to requirements for fish screens or by-pass devices do not apply.

We must receive your response in our Baker City office

Attention: Larry Nunn
Water Resources Department
158 12th Street NE
Salem OR 97310-0210

by September 3, 1999 in order to consider it in our decision on the application and to include the appropriate conditions in any approval order. We will presume that you do not have comments and do not intend to request fish screens or by-pass devices if we do not receive a response.

If you have questions, please call (541)523-5224.

Enclosure

cc: Wm # **10**, Mitch Lewis
Applicant

Oregon Department of Fish and Wildlife
Transfer Comment Form

Reference: Transfer # **8311**

We have reviewed the application for transfer and provide the following comments:

Please check one of the boxes related to potential injury to water rights.

☒ There does not appear to be a potential for injury to instream or other water rights as a result of the transfer.

☐ We believe that the transfer would injure the instream or other water right(s) on _____, tributary to _____. The nature of the injury is as follows: _____

_____

_____.

(Please attach any available supporting information.)

This transfer is not for a permanent or historic change in a point of diversion. Therefore, the provisions of ORS 540.525 and 540.532 related to requirements for fish screens or by-pass devices do not apply.

Wayne L Bowers
Signature

Wayne L Bowers
Printed Name

District Fish Biologist
Title

Please return this form to Larry Nunn, Water Resources Department, 158 12th Street NE, Salem OR 97310-0210 by ***September 3, 1999****.*

STATE OF OREGON

COUNTY OF HARNEY

ORDER APPROVING A CHANGE IN USE, PLACE OF USE, AND ADDITIONAL POINTS OF DIVERSION

Pursuant to ORS 540.510 to 540.530, after notice was given and no objections were filed, and finding that no injury to existing water rights would result, this order approves, as conditioned or limited herein, TRANSFER 8311 submitted by

U.S. FISH AND WILDLIFE SERVICE
911 NE 11th AVENUE
PORTLAND, OREGON 97232-4181.

The right to be modified was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County as evidenced by a PORTION of Certificate 15197. The decree is recorded in the Order Record of the Water Resources Director in Volume 13, at Page 508. The date of priority is 1885.

The right allows the use of the DONNER und BLITZEN RIVER, a tributary of MALHEUR LAKE, for IRRIGATION of 83.4 ACRES, DOMESTIC AND STOCK. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 2.08 cubic feet per second prior to June 15 and 1.04 cubic feet per second after June 15, if available at the authorized point of diversion: DUNN DAM — NW¼ SE¼, SECTION 15, T 27 S, RA 31 E, WM, or its equivalent in case of rotation, measured at the point of diversion from the source.

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2).

Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-15-005 you may either petition for judicial review or petition the Director for reconsideration of this order.

The amount of water used for irrigation, together with the amount secured under any other right for the same lands, is limited to ONE-FORTIETH of one cubic foot per second per acre prior to JUNE 15, and ONE-EIGHTIETH of one cubic foot per second per acre after JUNE 15, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet for each acre irrigated during the irrigation season from MARCH 15 to OCTOBER 1 of each year.

The authorized place of use is located as follows:

NE¼ SE¼ 23.8 ACRES
NW¼ SE¼ 33.7 ACRES
SW¼ SE¼ 23.9 ACRES
SE¼ SE¼ 2.0 ACRES
SECTION 15
TOWNSHIP 27 SOUTH, RANGE 31 EAST, W.M.

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in the decree.

The applicant proposes to change the use to WILDLIFE REFUGE MANAGEMENT, including, but not limited to wildlife, aquatic live, wetland enhancement, riparian area enhancement, fire protection, domestic, irrigation, stock, recreation, construction, and dust control.

The applicant proposes to change the place of use to:

W½ SW¼
SECTION 34
TOWNSHIP 26 SOUTH,
RANGE 31 EAST, W.M.

NW¼
SECTION 36
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

SE¼ NE¼
SE¼
SECTION 25

NE¼ NW¼
W¼
SECTION 2

ALL
SECTION 3

ALL
SECTION 4

S½ SE¼
SECTION 8

ALL
SECTION 9

ALL
SECTION 10

W¼
SECTION 11

W¼
SECTION 14

ALL
SECTION 15

ALL
SECTION 16

E½
NE¼ NW¼
S½ NW¼
SW¼
SECTION 17

SE¼ SW¼
SE¼
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

NW¼ NW¼
S½
SW¼
SECTION 23

W½
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

ALL
SECTION 33

ALL
SECTION 34

NW¼
W½ SW¼
SECTION 35
TOWNSHIP 27 SOUTH,
RANGE 31 EAST, W.M.

N½
SW¼
W½ SE¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

N½
E½ SE¼
SECTION 6

E¼
SECTION 7

ALL
SECTION 8

ALL
SECTION 9

NW¼ NE¼
W½
SECTION 10

W½
SECTION 15

ALL
SECTION 16

ALL
SECTION 17

E¼
SECTION 18

E¼
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

SW¼ NW¼
SW¼
SECTION 23

SW¼ NE¼
NW¼ SW¼
S½ NW¼
SW¼
W½ SE¼
SE¼ SE¼
SECTION 25

ALL
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

E½
E½ NW¼
NW¼ NW¼
NE¼ SW¼
SECTION 29

E½ NE¼
SECTION 32

E½
NW¼
NE¼ SW¼
SECTION 33

ALL
SECTION 34

ALL
SECTION 35

NE¼ NE¼
W½ NE¼
W½
W½ SE¼
SECTION 36
TOWNSHIP 28 SOUTH,
RANGE 31 EAST, W.M.

W½ NE¼
W½
W½ SE¼
SECTION 1

ALL
SECTION 2

ALL
SECTION 3

N½ NE¼
SE¼ NE¼
SECTION 4

E½
NW¼
E½ SW¼
SECTION 10

ALL
SECTION 11

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 12

ALL
SECTION 13

ALL
SECTION 14

E½
E½ NW¼
SECTION 15

NE¼ NE¼
SECTION 22

E½
NW¼
NE¼ SW¼
SECTION 23

NE¼
W½
W½ SE¼
SECTION 24

W½ NE¼
NW¼
N½ SW¼
SE¼ SW¼
W½ SE¼
SECTION 25

E½
SE¼ SW¼
SECTION 26

SE¼ SW¼
NE¼ SE¼
S½ SE¼
SECTION 34

W½ NE¼
E¼ NW¼
SW¼
SECTION 35
TOWNSHIP 29 SOUTH,
RANGE 31 EAST, W.M.

S½ NE¼
S½ NW¼
S½
SECTION 7

NW¼ SW¼
S½ SW¼
SW¼ SE¼
SECTION 8

S½ NW¼
SECTION 15

NE¼
NE¼ NW¼
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

N½
N½ SW¼
SE¼ SW¼
SE¼
SECTION 19

ALL
SECTION 20

W½
NW¼ SE¼
S½ SE¼
SECTION 21

NW¼ NE¼
N½ NW¼
SECTION 29

NE¼ NE¼
SECTION 30
TOWNSHIP 29 SOUTH,
RANGE 32 EAST, W.M.

SW¼ SW¼
SECTION 2

E½
E½ NW¼
NE¼ SW¼
S½ SW¼
SECTION 3

ALL
SECTION 10

W½
S½ SE¼
SECTION 11

S½ NE¼
W½
SE¼
SECTION 13

E½
N½ NW¼
SE¼ NW¼
E½ SW¼
SECTION 14

N½ NE¼
SW¼ NE¼
E½ NW¼
NE¼ SW¼
S½ SW¼
W½ SE¼
SECTION 15

E½ SE¼
SECTION 21

ALL
SECTION 22

NE¼ NE¼
W½ SW¼
SECTION 23

NE¼
N½ NW¼
SE¼ SW¼
SECTION 24

W½
SECTION 26

ALL
SECTION 27

NE¼ NE¼
S½ NE¼
SE¼
SECTION 28

E½
SE¼ SW¼
SECTION 33

ALL
SECTION 34

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 35
TOWNSHIP 30 SOUTH,
RANGE 31 EAST, W.M.

S½
SECTION 18

½
N¼ SW¼
SE¼
SECTION 19

W½
S½ SE¼
SECTION 20

S½ SW¼
SW¼ SE¼
SECTION 27

NW¼ NW¼
SE¼ NW¼
NW¼ SE¼
SE¼ SE¼
SECTION 28

NW¼
SECTION 29

NE¼ NE¼
SECTION 30

NE¼ NE¼
SECTION 33

N½ NE¼
NW¼ NW¼
SECTION 34
TOWNSHIP 30 SOUTH,
RANGE 32 EAST, W.M.

E½ SE¼
SECTION 1

E½ NE¼
NE¼ SE¼
S¼ SE¼
SECTION 12

E½
E¼ SW¼
SECTION 13

SE¼ SE¼
SECTION 23

E½
E¼ NW¼
SW¼
SECTION 24

ALL
SECTION 25

E¼
SECTION 26

NE¼ NE¼
S½ NE¼
E½ SW¼
SE¼
SECTION 35

ALL
SECTION 36
TOWNSHIP 31 SOUTH,
RANGE 32 EAST, W.M.

LOT 4
W½ SW¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

ALL
SECTION 6

ALL
SECTION 7

ALL
SECTION 8

N½ NE¼
W½
SECTION 9

NW¼ NE¼
W½
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

W½ NE¼
W½
W½ SE¼
SE¼ SE¼
SECTION 21

W½ NE¼
W½
W½ SE¼
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

W½ NE¼
W½
W½ SE¼
SECTION 33
TOWNSHIP 31 SOUTH,
RANGE 32½ EAST, W.M.

ALL
SECTION 1

NE¼
E½ SE¼
SECTION 2

N½ NE¼
SE¼ NE¼
SECTION 11

N½
N½ SE¼
SECTION 12
TOWNSHIP 32 SOUTH,
RANGE 32 EAST, W.M.

W½ NE¼
NW¼
N½ SW¼
NW¼ SE¼
SECTION 4

N½
SW¼
N½ SE¼
SW¼ SE¼
SECTION 5

ALL
SECTION 6

N½
N½ S½
SECTION 7

NW¼ NE¼
NE¼ NW¼
W½ W½
SECTION 8
TOWNSHIP 32 SOUTH,
RANGE 32½ EAST, W.M.

The applicant proposes to add the following additional points of diversion:

NEW BUCKAROO DAM - NW¼ NW¼, SECTION 6, T 32 S, R 32½ E, WM; 1356 FEET SOUTH AND 381 FEET EAST FROM THE NW CORNER, SECTION 6;

OLD BUCKAROO DAM - SW¼ SW¼, SECTION 31 T 31 S, R 32½ E, WM; 602 FEET NORTH AND 50 FEET EAST FROM THE SW CORNER, SECTION 31;

BRIDGE CREEK/EASTSIDE CANAL DIVERSION - NW¼ NE¼, SECTION 32, T 31 S, R 32½ E, WM; 852 FEET SOUTH AND 1796 FEET WEST FROM THE NE CORNER, SECTION 32;

KIGER CREEK DIVERSION - NW¼ NW¼, SECTION 21, T 29 S, R 32 E, WM; 66 FEET SOUTH AND 135 FEET EAST FROM THE NW CORNER, SECTION 21;

McCOY CREEK STRUCTURE - NW¼ SW¼, SECTION 21, T 29 S, R 32 E, WM; 2260 FEET SOUTH AND 960 FEET EAST FROM THE NW CORNER, SECTION 21;

KRUMBO POND DIKE - NW¼ NE¼ SECTION 24, T 30 S, R 31 E, WM; 635 FEET SOUTH AND 1779 FEET WEST FROM THE NE CORNER SECTION 24;

KRUMBO RESERVOIR DAM - NE¼ NW¼, SECTION 19, T 30 S, R 32 E, WM; 1082 FEET SOUTH AND 1976 FEET EAST FROM THE NW CORNER, SECTION 19;

SODHOUSE DAM - SE¼ SE¼, SECTION 3, T 27 S, R 31 E, WM; 856 FEET NORTH AND 4 FEET WEST FROM THE SE CORNER, SECTION 3;

DUNN DAM - NW¼ SE¼, SECTION 15, T 27 S, R 31 E, WM; 1436 FEET NORTH AND 2527 FEET WEST FROM THE SE CORNER, SECTION 31;

PAGE SPRINGS DAM - SW¼ SW¼, SECTION 8, T 32 S, R 32½ E, WM; 815 FEET NORTH AND 583 FEET EAST FROM THE SW CORNER, SECTION 8;

GRAIN CAMP DAM - NE¼ SE¼, SECTION 26, T 29 S, R 31 E, WM; 859 FEET SOUTH AND 527 WEST FROM THE NE CORNER, SECTION 26;

BUSSE DAM - NW¼ NE¼, SECTION 22, T 28 S, R 31 E, WM; 906 FEET SOUTH AND 2094 FEET WEST FROM THE NE CORNER, SECTION 22;

BLITZEN CANAL - SE¼ SE¼, SECTION 24, T 31 S, R 32 E, WM; 51 FEET NORTH AND 69 FEET WEST FROM THE SE CORNER, SECTION 24;

BRIDGE CREEK DIVERSION - NW¼ NE¼, SECTION 29, T 31 S, R 32½ E, WM; 87 FEET SOUTH AND 2474 FEET WEST FROM THE NE CORNER, SECTION 29.

THESE CHANGES TO AN EXISTING WATER RIGHT MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE WATER USER:

1. The proposed change shall be completed on or before October 1, 2001.

2. The quantity of water diverted at the new points of diversion, together with that diverted at the old points of diversion, shall not exceed the quantity of water lawfully available at the original points of diversion.

3. The amount of water used for Wildlife Refuge Management is limited to 2.08 cubic feet per second prior to June 15, and 1.04 cubic feet per second after June 15, and shall be further limited to a diversion of not to exceed 250.2 acre-feet during the irrigation season from March 15 to October 1 of each year.

4. The water user shall not irrigate or partially irrigate more than 83.4 acres, during the irrigation season, in any year as a part of this right.

5. The water user shall install and maintain a headgate, in-line flow meter, weir, or other suitable device for measuring and recording the quantity of water diverted. The type and plans of the headgate and measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

6. When required by the Department, the water user shall install and maintain in-line flow meters, weirs, or other suitable devices for measuring and recording the quantity of water available at the original points of diversion. The types and plans of the measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

7. The water user shall operate and maintain the headgate and measuring device, as needed. The water user shall report total flow figures when requested by the Watermaster. The Watermaster may operate the headgate and monitor the accuracy of the measuring device, as needed.

8. Water shall be acquired from the same surface water sources as the original point of diversion.

9. The former place of use shall no longer be irrigated as a part of this water right.

10. The U.S. Fish and Wildlife Service shall provide copies of any water management plans developed for use of water for the Malheur National Wildlife Refuge to the local Watermaster.

Certificate 15197 is canceled. A new certificate will be issued to confirm that portion of the right NOT involved in this transfer. When satisfactory proof of the completed change is received, a new certificate confirming this water right will be issued.

WITNESS the signature of the Water Resources Director, affixed _____.

_____
Martha O. Pagel, Director

STATE OF OREGON

COUNTY OF HARNEY

ORDER APPROVING A CHANGE IN USE, PLACE OF USE, AND ADDITIONAL POINTS OF DIVERSION

Pursuant to ORS 540.510 to 540.530, after notice was given and no objections were filed, and finding that no injury to existing water rights would result, this order approves, as conditioned or limited herein, TRANSFER 8311 submitted by

U.S. FISH AND WILDLIFE SERVICE
911 NE 11th AVENUE
PORTLAND, OREGON 97232-4181.

The right to be modified was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County as evidenced by a PORTION of Certificate 15197. The decree is recorded in the Order Record of the Water Resources Director in Volume 13, at Page 508. The date of priority is 1885.

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2).

Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-15-005, you may either petition for judicial review or petition the Director for reconsideration of this order.

The right allows the use of the DONNER und BLITZEN RIVER, a tributary of MALHEUR LAKE, for IRRIGATION of 83.4 ACRES, DOMESTIC AND STOCK. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 2.08 cubic feet per second prior to June 15 and 1.04 cubic feet per second after June 15, if available at the authorized point of diversion: DUNN DAM – NW¼ SE¼, SECTION 15, T 27 S, RA 31 E, WM, or its equivalent in case of rotation, measured at the point of diversion from the source.

The amount of water used for irrigation, together with the amount secured under any other right for the same lands, is limited to ONE-FORTIETH of one cubic foot per second per acre prior to JUNE 15, and ONE-EIGHTIETH of one cubic foot per second per acre after JUNE 15, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet for each acre irrigated during the irrigation season from MARCH 15 to OCTOBER 1 of each year.

The authorized place of use is located as follows:

NE¼ SE¼	23.8 ACRES
NW¼ SE¼	33.7 ACRES
SW¼ SE¼	23.9 ACRES
SE¼ SE¼	2.0 ACRES

SECTION 15
TOWNSHIP 27 SOUTH, RANGE 31 EAST, W.M.

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in the decree.

The applicant proposes to change the use to WILDLIFE REFUGE MANAGEMENT, including wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock, recreation, construction, and dust control.

The applicant proposes to change the place of use to:

W½ SW¼
SECTION 34
TOWNSHIP 26 SOUTH,
RANGE 31 EAST, W.M.

SE¼ NE¼
SE¼
SECTION 25

NW¼
SECTION 36
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

NE¼ NW¼
W¼
SECTION 2

ALL
SECTION 3

ALL
SECTION 4

S½ SE¼
SECTION 8

ALL
SECTION 9

ALL
SECTION 10

W¼
SECTION 11

W¼
SECTION 14

ALL
SECTION 15

ALL
SECTION 16

E½
NE¼ NW¼
S½ NW¼
SW¼
SECTION 17

SE¼ SW¼
SE¼
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

NW¼ NW¼
S½
SW¼
SECTION 23

W½
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

ALL
SECTION 33

ALL
SECTION 34

NW¼
W½ SW¼
SECTION 35
TOWNSHIP 27 SOUTH,
RANGE 31 EAST, W.M.

N½
SW¼
W½ SE¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

N½
E½ SE¼
SECTION 6

E½
SECTION 7

ALL
SECTION 8

ALL
SECTION 9

NW¼ NE¼
W½
SECTION 10

W½
SECTION 15

ALL
SECTION 16

ALL
SECTION 17

E¼
SECTION 18

E¼
SECTION 19

ALL
SECTION 20

ALL
SECTION 21

ALL
SECTION 22

SW¼ NW¼
SW¼
SECTION 23

SW¼ NE¼
NW¼ SW¼
S½ NW¼
SW¼
W½ SE¼
SE¼ SE¼
SECTION 25

ALL
SECTION 26

ALL
SECTION 27

ALL
SECTION 28

E½
E½ NW¼
NW¼ NW¼
NE¼ SW¼
SECTION 29

E½ NE¼
SECTION 32

E½
NW¼
NE¼ SW¼
SECTION 33

ALL
SECTION 34

ALL
SECTION 35

NE¼ NE¼
W½ NE¼
W½
W½ SE¼
SECTION 36
TOWNSHIP 28 SOUTH,
RANGE 31 EAST, W.M.

W½ NE¼
W½
W½ SE¼
SECTION 1

ALL
SECTION 2

ALL
SECTION 3

N½ NE¼
SE¼ NE¼
SECTION 4

E½
NW¼
E½ SW¼
SECTION 10

ALL
SECTION 11

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 12

ALL
SECTION 13

ALL
SECTION 14

E½
E½ NW¼
SECTION 15

NE¼ NE¼
SECTION 22

E½
NW¼
NE¼ SW¼
SECTION 23

NE¼
W½
W½ SE¼
SECTION 24

W½ NE¼
NW¼
N½ SW¼
SE¼ SW¼
W½ SE¼
SECTION 25

E½
SE¼ SW¼
SECTION 26

SE¼ SW¼
NE¼ SE¼
S½ SE¼
SECTION 34

W½ NE¼
E¼ NW¼
SW¼
SECTION 35
TOWNSHIP 29 SOUTH,
RANGE 31 EAST, W.M.

S½ NE¼
S½ NW¼
S½
SECTION 7

NW¼ SW¼
S½ SW¼
SW¼ SE¼
SECTION 8

S½ NW¼
SECTION 15

NE¼
NE¼ NW¼
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

N½
N½ SW¼
SE¼ SW¼
SE¼
SECTION 19

ALL
SECTION 20

W½
NW¼ SE¼
S½ SE¼
SECTION 21

NW¼ NE¼
N½ NW¼
SECTION 29

NE¼ NE¼
SECTION 30
TOWNSHIP 29 SOUTH,
RANGE 32 EAST, W.M.

SW¼ SW¼
SECTION 2

E½
E½ NW¼
NE¼ SW¼
S½ SW¼
SECTION 3

ALL
SECTION 10

W½
S½ SE¼
SECTION 11

S½ NE¼
W½
SE¼
SECTION 13

E½
N½ NW¼
SE¼ NW¼
E½ SW¼
SECTION 14

N½ NE¼
SW¼ NE¼
E½ NW¼
NE¼ SW¼
S½ SW¼
W½ SE¼
SECTION 15

E½ SE¼
SECTION 21

ALL
SECTION 22

NE¼ NE¼
W½ SW¼
SECTION 23

NE¼
N½ NW¼
SE¼ SW¼
SECTION 24

W½
SECTION 26

ALL
SECTION 27

NE¼ NE¼
S½ NE¼
SE¼
SECTION 28

E½
SE¼ SW¼
SECTION 33

ALL
SECTION 34

NW¼ NE¼
S½ NE¼
W½
SE¼
SECTION 35
TOWNSHIP 30 SOUTH,
RANGE 31 EAST, W.M.

S½
SECTION 18

½
N¼ SW¼
SE¼
SECTION 19

W½
S½ SE¼
SECTION 20

S½ SW¼
SW¼ SE¼
SECTION 27

NW¼ NW¼
SE¼ NW¼
NW¼ SE¼
SE¼ SE¼
SECTION 28

NW¼
SECTION 29

NE¼ NE¼
SECTION 30

NE¼ NE¼
SECTION 33

N½ NE¼
NW¼ NW¼
SECTION 34
TOWNSHIP 30 SOUTH,
RANGE 32 EAST, W.M.

E½ SE¼
SECTION 1

E½ NE¼
NE¼ SE¼
S½ SE¼
SECTION 12

E½
E¼ SW¼
SECTION 13

SE¼ SE¼
SECTION 23

E½
E¼ NW¼
SW¼
SECTION 24

ALL
SECTION 25

E½
SECTION 26

NE¼ NE¼
S½ NE¼
E½ SW¼
SE¼
SECTION 35

ALL
SECTION 36
TOWNSHIP 31 SOUTH,
RANGE 32 EAST, W.M.

LOT 4
W½ SW¼
SECTION 3

ALL
SECTION 4

ALL
SECTION 5

ALL
SECTION 6

ALL
SECTION 7

ALL
SECTION 8

N½ NE¼
W½
SECTION 9

NW¼ NE¼
W½
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

ALL
SECTION 19

ALL
SECTION 20

W½ NE¼
W½
W½ SE¼
SE¼ SE¼
SECTION 21

W½ NE¼
W½
W½ SE¼
SECTION 28

ALL
SECTION 29

ALL
SECTION 30

ALL
SECTION 31

ALL
SECTION 32

W½ NE¼
W½
W½ SE¼
SECTION 33
TOWNSHIP 31 SOUTH,
RANGE 32½ EAST, W.M.

ALL
SECTION 1

NE¼
E½ SE¼
SECTION 2

N½ NE¼
SE¼ NE¼
SECTION 11

N½
N½ SE¼
SECTION 12
TOWNSHIP 32 SOUTH,
RANGE 32 EAST, W.M.

W½ NE¼
NW¼
N½ SW¼
NW¼ SE¼
SECTION 4

N½
SW¼
N½ SE¼
SW¼ SE¼
SECTION 5

ALL
SECTION 6

N½
N½ S½
SECTION 7

NW¼ NE¼
NE¼ NW¼
W½ W½
SECTION 8
TOWNSHIP 32 SOUTH,
RANGE 32½ EAST, W.M.

The applicant proposes to add the following additional points of diversion:

NEW BUCKAROO DAM - NW¼ NW¼, SECTION 6, T 32 S, R 32½ E, WM; 1356 FEET SOUTH AND 381 FEET EAST FROM THE NW CORNER, SECTION 6;

OLD BUCKAROO DAM - SW¼ SW¼, SECTION 31 T 31 S, R 32½ E, WM; 602 FEET NORTH AND 50 FEET EAST FROM THE SW CORNER, SECTION 31;

BRIDGE CREEK/EASTSIDE CANAL DIVERSION - NW¼ NE¼, SECTION 32, T 31 S, R 32½ E, WM; 852 FEET SOUTH AND 1796 FEET WEST FROM THE NE CORNER, SECTION 32;

KIGER CREEK DIVERSION - NW¼ NW¼, SECTION 21, T 29 S, R 32 E, WM; 66 FEET SOUTH AND 135 FEET EAST FROM THE NW CORNER, SECTION 21;

McCOY CREEK STRUCTURE - NW¼ SW¼, SECTION 21, T 29 S, R 32 E, WM; 2260 FEET SOUTH AND 960 FEET EAST FROM THE NW CORNER, SECTION 21;

KRUMBO POND DIKE - NW¼ NE¼ SECTION 24, T 30 S, R 31 E, WM; 635 FEET SOUTH AND 1779 FEET WEST FROM THE NE CORNER SECTION 24;

KRUMBO RESERVOIR DAM - NE¼ NW¼, SECTION 19, T 30 S, R 32 E, WM; 1082 FEET SOUTH AND 1976 FEET EAST FROM THE NW CORNER, SECTION 19;

SODHOUSE DAM - SE¼ SE¼, SECTION 3, T 27 S, R 31 E, WM; 856 FEET NORTH AND 4 FEET WEST FROM THE SE CORNER, SECTION 3;

DUNN DAM - NW¼ SE¼, SECTION 15, T 27 S, R 31 E, WM; 1436 FEET NORTH AND 2527 FEET WEST FROM THE SE CORNER, SECTION 31;

PAGE SPRINGS DAM - SW¼ SW¼, SECTION 8, T 32 S, R 32½ E, WM; 815 FEET NORTH AND 583 FEET EAST FROM THE SW CORNER, SECTION 8;

GRAIN CAMP DAM - NE¼ SE¼, SECTION 26, T 29 S, R 31 E, WM; 859 FEET SOUTH AND 527 WEST FROM THE NE CORNER, SECTION 26;

BUSSE DAM - NW¼ NE¼, SECTION 22, T 28 S, R 31 E, WM; 906 FEET SOUTH AND 2094 FEET WEST FROM THE NE CORNER, SECTION 22;

BLITZEN CANAL - SE¼ SE¼, SECTION 24, T 31 S, R 32 E, WM; 51 FEET NORTH AND 69 FEET WEST FROM THE SE CORNER, SECTION 24;

BRIDGE CREEK DIVERSION - NW¼ NE¼, SECTION 29, T 31 S, R 32½ E, WM; 87 FEET SOUTH AND 2474 FEET WEST FROM THE NE CORNER, SECTION 29.

THESE CHANGES TO AN EXISTING WATER RIGHT MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE WATER USER:

1. The proposed changes shall be completed on or before October 1, 2002.

2. The quantity of water diverted at the new points of diversion, together with that diverted at the old points of diversion, shall not exceed the quantity of water lawfully available at the original points of diversion.

3. The amount of water used for Wildlife Refuge Management is limited to 2.08 cubic feet per second prior to June 15, and 1.04 cubic feet per second after June 15, and shall be further limited to a diversion of not to exceed 250.2 acre-feet during the irrigation season from March 15 to October 1 of each year.

4. The water user shall not irrigate or partially irrigate more than 83.4 acres, during the irrigation season, in any year as a part of this right.

5. The water user shall install and maintain a headgate, in-line flow meter, weir, or other suitable device for measuring and recording the quantity of water diverted. The type and plans of the headgate and measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

6. When required by the Department, the water user shall install and maintain in-line flow meters, weirs, or other suitable devices for measuring and recording the quantity of water available at the original points of diversion. The types and plans of the measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

7. The water user shall operate and maintain the headgate and measuring device, as needed. The water user shall report total flow figures when requested by the Watermaster. The Watermaster may operate the headgate and monitor the accuracy of the measuring device, as needed.

8. Water shall be acquired from the same surface water sources as the original point of diversion.

9. The former place of use shall no longer be irrigated as a part of this water right.

10. The U.S. Fish and Wildlife Service shall provide copies of any water management plans developed for use of water for the Malheur National Wildlife Refuge to the local Watermaster.

Certificate 15197 is canceled. A new certificate will be issued to confirm that portion of the right NOT involved in this transfer. When satisfactory proof of the completed change is received, a new certificate confirming this water right will be issued.

WITNESS the signature of the Water Resources Director, affixed _____.

_____
Paul R. Cleary, Director

STATE OF OREGON

COUNTY OF HARNEY

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

W.J. DUNN
NARROWS, OREGON

confirms the right to use the waters of the DONNER und BLITZEN RIVER, a tributary of MALHEUR LAKE, for IRRIGATION of 1174.25 ACRES, DOMESTIC, AND STOCK. 1230.85

This right was confirmed by decree of the Circuit Court of the State of Oregon for HARNEY County. The decree is of record at Salem, in the Order Record of the WATER RESOURCES DIRECTOR, in Volume 13, at Page 508. The dates of priority are 1887 for 236.20 acres, 1897 for 253.12 acres, 1904 for 39.97 acres, 1906 for 160.44 acres, 1907 for 161.46 acres, 1908 for 123.51 acres, 1909 for 79.76 acres, 1910 for 39.79 acres, and 1911 for 80.00 acres. 1895 for 56.6

The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed ONE-FORTIETH OF A CUBIC FOOT PER SECOND PRIOR TO JUNE 15, AND ONE-EIGHTIETH OF A CUBIC FOOT PER SECOND PER ACRE AFTER JUNE 15, WITH A TOTAL LIMITATION OF THREE ACRE FEET PER ACRE FROM MARCH 15 TO OCTOBER 1, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

DUNN DAM - NW¼ SE¼, SECTION 15, T 27 S, R 31 E, WM.

A description of the place of use to which this right is appurtenant is as follows:

add 1895

1887

	NE¼ NE¼	40.00 ACRES
LOT 1 →		36.20 ACRES
	SECTION 32	
	SW¼ NE¼	40.00 ACRES
	SE¼ NE¼	40.00 ACRES
	NE¼ SW¼	40.00 ACRES
	SE¼ NW¼	40.00 ACRES
	SECTION 33	
	TOWNSHIP 26 SOUTH,	
	RANGE 31 EAST, W.M.	
	SOUTH OF MALHEUR LAKE	

1877

LOT 1	(SW¼ SW¼)	2.00 ACRES
	SECTION 28	
LOT 1	(NE¼ NE¼)	7.10 ACRES
LOT 2	(SE¼ NE¼)	42.67 ACRES
LOT 7	(SE¼ NW¼)	7.77 ACRES
	SE¼ SE¼	40.00 ACRES
	SECTION 32	

BW

T-8311.LHN

LOT	1	(NW¼ NW¼)	24.53 ACRES
LOT	2	(NW¼ SW¼)	33.77 ACRES
LOT	3	(SW¼ SW¼)	34.74 ACRES
LOT	4	(SE¼ SW¼)	12.38 ACRES
LOT	5	(SW¼ SE¼)	14.26 ACRES
LOT	6	(SE¼ SE¼)	33.90 ACRES

SECTION 33
TOWNSHIP 26 SOUTH,
RANGE 30 EAST, W.M.

1904

LOT	11	(NW¼ NW¼)	39.97 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1906

LOT	5	(SW¼ NW¼)	42.89 ACRES
LOT	4	(NW¼ SW¼)	37.55 ACRES

SECTION 3

		SE¼ NE¼	40.00 ACRES
LOT	7	(NE¼ NE¼)	20.75 ACRES
LOT	1	(NE¼ NE¼)	19.25 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1907

		SW¼ NE¼	40.00 ACRES
		SE¼ NW¼	40.00 ACRES
LOT	5	(NE¼ SW¼)	41.84 ACRES
LOT	6	(NW¼ SE¼)	39.62 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1908

LOT	6	(NE¼ SW¼)	20.88 ACRES
LOT	5	(SE¼ SW¼)	42.35 ACRES
LOT	3	(NE¼ SE¼)	42.49 ACRES
LOT	4	(SW¼ SE¼)	17.79 ACRES

SECTION 32
TOWNSHIP 26 SOUTH,
RANGE 30 EAST, W.M.

1909

LOT	9	(NW¼ NE¼)	39.85 ACRES
LOT	10	(NE¼ NW¼)	39.91 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1910

LOT	8	(NE¼ NE¼)	39.79 ACRES

SECTION 4
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

1911

LOT	1	(NE¼ NE¼)	40.00 ACRES
LOT	2	(NW¼ NE¼)	40.00 ACRES

SECTION 5
TOWNSHIP 27 SOUTH,
RANGE 30 EAST, W.M.

This certificate describes that portion of the water right confirmed by Certificate 15197, State Record of Water Right Certificates, NOT modified by the provisions of an order of the Water Resources Director entered _____, approving Transfer Application 8311.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in said decree.

WITNESS the signature of the Water Resources Director,

affixed _____.

_____

Martha O. Pagel, Director

PRC

Recorded in State Record of Water Right Certificates numbered #.

T-8311.LHN

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
(503) 378-3739
FAX (503) 378-8130

October 10, 2000

Brad Harper
Water for Life, Inc.
P.O. Box 12248
Salem, Oregon 97309-0248

Andy Dunbar
HCR 72, Box 200E
Princeton, Oregon 97721

Barbara Cannady
Harney County Soil and Water Conservation District
P.O. Box 848
Hines, Oregon 97738
(541) 573-5010

Barbara Scott-Brier
U.S. Fish and Wildlife service
Office of the Solicitor, Pacific Northwest Region
500 N.E. Multnomah St. #607
Portland, Oregon 97232

RE: Notice of Hearing and Prehearing Conference

Attached you will find the Department's Notice of Hearing and Prehearing Conference. The prehearing conference will be by telephone. Please let the Hearing Officer know by November 8, 2000, if you want to be contacted at a number different than that listed in the notice. The Hearing Officer for this case is:

Paul Vincent, Hearing Officer
Employment Department
350 Winter Street NE
Salem, Oregon 97301-3878
(503) 947-7061
FAX (503) 947-7037

If you have any questions please contact me at (503) 378-8455 ext. 262.

Sincerely,

Adam Sussman
Manager, Enforcement Section

cc: Paul Rauch, Jerry Rodgers, Mitch Lewis

BEFORE THE OREGON WATER RESOURCES DEPARTMENT

IN THE MATTER OF THE PROTESTS AGAINST TRANSFER APPLICATIONS T-8309, 8310, 8311, 8312	)	
Applicant - U.S. Fish and Wildlife Service	)	**NOTICE OF HEARING AND PREHEARING CONFERENCE**
Protestants - Andy Dunbar Water for Life, Inc. Hammond Ranches, Inc, Dwight & Susie Hammond Harney Co. Haygrowers Assn., John & Debbie Volle Harney Soil and Water Conservation District	)	

Contested case hearing

You are hereby notified, pursuant to the provisions of ORS 183.415 and 540.520, that a consolidated contested case hearing in this matter will be held. The hearing will be before Paul Vincent, Hearing Officer, assigned to this matter from the Oregon Central Hearing Officer Panel. The hearing will be conducted pursuant to the applicable provisions of the Oregon Administrative Procedures Act, ORS 183.310 *et seq*, the procedural rules found at OAR 137-003-0501 to 137-003-0700 and the Commission's supplemental procedural rules, OAR Chapter 690 Division 2. Jurisdiction is conferred by ORS 540.520. The substantive provisions of the law applicable to the application and the determination to be made on the protests are found at ORS 540.505 - 540.580 and OAR Chapter 690 Division 15.

When held, the purpose of the hearing is to take testimony and evidence from the parties and their witnesses on the question of *whether the proposed changes as described by the transfer applications would result in injury to existing water rights.* To prevail, Protestants will need to factually demonstrate at the hearing by a preponderance of evidence that the proposed changes will result in injury to existing water rights.

The time and place for the hearing will be set at the prehearing conference described below.

Prehearing conference

A pre-hearing conference will be held on the above described matter at **10:00 am Wednesday November 15, 2000.** The prehearing conference will be conducted by Hearing Officer Paul Vincent. The conference will be held by telephone. The parties will be contacted by the Hearing Officer at the following phone numbers: Brad Harper representing Water for Life, Inc., Hammond Ranches, Inc., and Harney County Haygrowers Association will be contacted at (503) 375-6003; Protestant Andy Dunbar will be contacted at (541) 493-2595; Protestant Harney County Soil and

Water Conservation District will be contacted at (541) 573-5010; Barbara Scott-Brier, representing the Applicant will be contacted at (503) 231-2139 and Adam Sussman, Department Representative will be contacted at (503) 378-8455 ext. 262. If parties need to be contacted at a different telephone number they must contact Hearing Officer Vincent by November 8, 2000.

The purpose of the pre-hearing conference shall be to discuss hearing procedure, determine a schedule for pre-hearing filings and discovery, to schedule a hearing date, and to discuss and refine the issue for hearing.

The Water Resources Department is currently represented in this matter by Adam Sussman, Agency Representative. Parties have the right to be represented by counsel.

A copy of Parties Rights in Contested Case Hearings is enclosed.

Dated October 9, 2000

Barry Norris, Administrator

CERTIFICATE OF SERVICE

I certify that on October 11, 2000 I mailed certified, return receipt requested, and by U.S. mail postage prepaid a copy of this NOTICE OF HEARING AND NOTICE OF PREHEARING CONFERENCE to:

For Protestants Water for Life, Inc., Hammond Ranches, Inc., Harney County Haygrowers Association:

Brad Harper
Water for Life, Inc.
P.O. Box 12248
Salem, Oregon 97309-0248
(503) 375-6003
FAX (503) 375-9017

Andy Dunbar
HCR 72, Box 200E
Princeton, Oregon 97721
(541) 493-2595

Barbara Cannady
Harney County Soil and Water Conservation District
P.O. Box 848
Hines, Oregon 97738
(541) 573-5010

For Applicant -

Barbara Scott-Brier
U.S. Fish and Wildlife service
Office of the Solicitor, Pacific Northwest Region
500 N.E. Multnomah St. #607
Portland, Oregon 97232
(503) 231-2139
FAX (503)

And by U.S. mail postage prepaid a copy of this NOTICE OF HEARING AND NOTICE OF PREHEARING CONFERENCE to:

Paul Vincent, Hearing Officer
Employment Department
350 Winter Street NE
Salem, Oregon 97301-3878
(503) 947-7061
FAX (503) 947-7037

Janet Halladey

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

November 22, 1999

U.S. Fish and Wildlife Service
911 NE 11th Ave
Portland, OR 97232-4181

Attention: Paul Rauch

REFERENCE: Transfers 8309, 8310, 8311, and 8312

We received your application amendments and corrected maps. We are continuing our review of your applications. If we have further questions, we will contact you. As I indicated, once we have prepared draft orders, we will share them with you for your review and comments.

Notice of the transfer applications must be published in the local newspaper having general circulation in the area of the water right. The notice must be published at least once a week for three consecutive weeks. Enclosed is the notice to be published. Please have the newspaper insert the last date of publication in the appropriate place in the notice. Following the last date of publication, please submit the affidavit of publication supplied by the newspaper.

If you have an questions, please call me at (503) 378-8455, ext. 275, or (800) 624-3199 (in-state only).

Sincerely,

LARRY H. NUNN
Transfer Coordinator

cc: Mitch Lewis, Watermaster

WATER RESOURCES DEPARTMENT INTEROFFICE MEMO

November 22, 1999

TO: Harney County Watershed Council
Water for Life
WaterWatch of Oregon

FROM: Larry Nunn, Transfer Coordinator

SUBJECT: Notice of Malheur National Wildlife Refuge Transfers

I have just sent the notice to be published in the location newspaper to the USFWS, Portland office. The notice is to be published in accordance with ORS 540.520(4). Please check the local newspaper for exact dates of publication.

NOTICE OF WATER RIGHT TRANSFERS 8309, 8310, 8311, and 8312

The US Fish and Wildlife Service filed an application with the Water Resources Department for changes in use, place of use, and additional points of diversion of water as provided by ORS 540.510 to 540.530.

Certificate 28524, in the name of the US Fish and Wildlife Service, includes a right limited to 815.07 cubic feet per second prior to June 15, and 407.53 cubic feet per second after June 15, from the Donner und Blitzen River and its tributaries, with priority dates of 1872, 1877, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1897, 1899, 1901, and 1902 for irrigation of 32,602.6 acres, stock and domestic use.

The points of diversion for this right are the Blitzen, Stubblefield, Busse, Buena Vista, Warmsprings, Bridge Creek and Diamond Canals, as well as natural sloughs, channels, and dams.

Certificate 15198, in the name of W.J. Dunn, includes a right limited to 2.71 cubic feet per second prior to June 15, and 1.36 cubic feet per second after June 15, from the Donner und Blitzen River, with a priority date of 1885 for irrigation of 108.4 acres, domestic, and stock.

The point of diversion for this right is the Dunn Dam in the NW¼ SE¼, Section 15, T 27 S, R 31 E, WM.

Certificate 15197, in the name of W.J. Dunn, includes a right limited to 2.08 cubic feet per second prior to June 15, and 1.04 cubic feet per second after June 15, from the Donner und Blitzen River, with a priority date of 1885 for irrigation of 83.4 acres, domestic, and stock.

The point of diversion for this right is the Dunn Dam in the NW¼ SE¼, Section 15, T 27 S, R 31 E, WM.

Certificate 14367, in the name of the U.S. Fish and Wildlife Service, Malheur National Wildlife Refuge, includes a right limited to 0.35 cubic foot per second, being 0.05 cfs for domestic and stock, and 0.30 cfs for irrigation, from Bridge Creek, with a priority date of September 30, 1930 for irrigation of 23.1 acres, stock, and domestic use.

The point of diversion for this right is in the SW¼ SE¼, Section 20, T 31 S, R 32½ E, WM.

The applicant proposes to change the use to Wildlife Refuge Management, including but not limited to wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire protection, domestic, stock, recreation, construction, and dust control. The applicant proposes to change the place of use to the area within the Malheur Wildlife Refuge boundaries.

The applicant proposes to add the following points of diversion, as necessary:

New Buckaroo Dam, NW¼ NW¼, Section 6, T 32 S, R 32½ E, WM;

Old Buckaroo Dam, SW¼ SW¼, Section 31, T 31 S, R 32½ E, WM;
Bridge Creek/Eastside Canal, NW¼ SE¼, Section 32, T 31 S, R 32½ E, WM;
Kiger Creek Diversion, NW¼ NW¼, Section 21, T 29 S, R 32 E, WM;
McCoy Creek Structure, NW¼ SW¼, Section 21, T 29 S, R 32 E, WM;
Krumbo Pond Dike, NW¼ NE¼, Section 24, T 30 S, R 31 E, WM;
Krumbo Reservoir Dam, NE¼ NW¼, Section 19, T 30 S, R 32 E, WM;
Sodhouse Dam, SE¼ SE¼, SECTION 3, T 27 S, R 31 E, WM;
Dunn Dam, NW¼ SE¼, Section 15, T 27 S, R 31 E, WM;
Page Springs Dam, SW¼ SW¼, Section 8, T 32 S, R 32½ E, WM;
Grain Camp Dam, NE¼ NE¼, Section 26, T 29 S, R 31 E, WM;
Busse Dam, NW¼ NE¼, Section 22, T 28 S, R 31 E, WM;
Blitzen Canal, SE¼ SE¼, Section 24, T 31 S, R 32 E, WM;
Diamond Canal, NE¼, Section 25, T 29 S, R 32 E, WM; and
Bridge Creek Diversion, NW¼ NE¼, Section 29, T 31 S, R 32½E WM.

The transfers, if approved, will preserve the existing priorities, as well as the rate, duty, and season limitations, of the existing water rights.

Protests may be filed by persons who think their water right may be injured by these changes. Additional information or forms and rules for filing protests are available from the Water Resources Department by calling (800) 624-3199. If a protest is filed a hearing may be held.

The last date of publication is [last date of publication]. IF NO PROTEST IS FILED WITHIN 30 DAYS AFTER THE LAST DATE OF PUBLICATION, THE CHANGE MAY BE APPROVED WITHOUT A HEARING.

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

September 28, 1999

U.S. Fish and Wildlife Service
911 NE 11th Ave
Portland, OR 97232-4181

Attention: Paul Rauch

REFERENCE: Transfers 8309, 8310, 8311, and 8312

We are examining your water right transfer applications for the Malheur Wildlife Refuge. There are some problems which need to be resolved. These problems revolve mainly around the points of diversion. They also include use of water from Krumbo Reservoir and the use of water for stock and domestic.

The Donner und Blitzen Decree lists several diversions for the right evidenced by Certificate 28524. These diversions are the Blitzen, Stubblefield, Busse, Buena Vista, Warmsprings, Bridge Creek, and Diamond Canals, as well as overflow from the natural sloughs, channels, and dams. According to the Findings of the State Engineer, recorded in Order Record of the Water Resources Director, Volume 12, Page 513, these canals control all the water of the Donner und Blitzen River and its tributaries, at least in connection with the right evidenced by Certificate 28524.

The Busse and Stubblefield Canals both obtain water from the Busse Dam. The Buena Vista Canal obtains water from the Grain Camp Dam. The Warmsprings Canal obtains water from the Page Springs Dam. These diversions are correctly listed on the application as authorized diversion points.

The Blitzen Canal runs between the SE corner, Section 24, T 31 S, R 32 E, WM, and the NW¼, Section 35, T 28 S, R 31 E, WM. The end of the canal at the SE corner of Section 24 is shown on the map the Bridge Creek Headgate. The other end of the canal is not identified on the map. The Blitzen Canal appears to actually be a channelizing of the Donner und Blitzen River. These points are not listed on the application as authorized diversion points.

The Bridge Creek Canal's authorized diversion, according to the State Engineer's findings, is located in the NE¼, Section 29, T 31 S, R 32½ E, WM. This point is not shown on the map, nor listed on the application. The point shown on the map and listed on the application is located over a mile south, in Section 32.

The Diamond Canal, according to the State Engineer's findings, diverts water from McCoy, Cucamonga, and Kiger Creeks, and heads in the NE¼, Section 25, T 29 S, R 32 E, WM. This area in now some three miles east of the current refuge lands.

The additional diversions listed on the application, New Buckaroo Dam, Old Buckaroo Dam, Bridge Creek Diversion, Kiger Creek Diversion, McCoy Creek Structure, Krumbo Pond Dike, Dunn Dam (authorized under other rights), and Schoolhouse Dam, are not authorized points of diversion for the right evidenced by Certificate 28524. If you intend to divert water under the modified right at these diversion points, you need to amend your application to request changes in point of diversion to add these diversions.

The rights evidenced by Certificates are 15197 and 15198 are authorized to divert water from the Dunn Dam. If you intend to use this water through out the rest of the refuge, you will need to amend your application to request changes in point of diversion to add the other diversions.

The authorized point of diversion for the right evidenced by Certificate 14367, is in the SW¼ SE¼, Section 20. This is not the location shown on your application. You need to amend your application to show the correct authorized diversion point. Also, if you intend to use this water through out the rest of the refuge, you will need to amend your application to request changes in point of diversion to add the other diversions.

Certificate 28524 also includes the right to maintain Krumbo Reservoir as a Wildlife Habitat Area. Did you intend to include this portion of the right in your application? If so, you will need to amend your application to include this use and place of use.

The rights evidenced by Certificates 28524, 15197, and 15198 also included use of water for stock and domestic use. These quantities are included with the irrigation water quantities. The use of water for stock and domestic use, under these rights, will still be included in the Wildlife Refuge Management use.

The right evidenced by Certificate 14367 includes a specific quantity of water for stock and domestic uses. The stock and domestic water is separate from the irrigation water. Please describe your use of water for domestic and stock uses, including the quantity used under this certificate. Any portion of this water not used should also be included in your voluntary cancellation affidavit.

Your are requesting to transfer from irrigation to Wildlife Refuge Management use only the portions of these rights currently still being irrigated. It is my understanding you are planning to request cancellation of the remainder of the rights within the refuge boundaries. That being the case, we would like your voluntary cancellation affidavit submitted so that the transfer approval and cancellation orders can be issued together. I suggest you include in your voluntary cancellation affidavit language to the effect, that upon approval of the transfer applications you request cancellation of the remaining rights.

Notice of the transfer applications must be published in the local newspaper having general circulation in the vicinity of the water rights. We normally prepare that notice and sent it to you for publication. I am holding off on preparing the newspaper notice until these questions are answered so that the new points of diversion may be included, as well as the stock water under Certificate 14367.

If you agree, please prepare a new list of authorized points of diversion for Transfer Application 8309. If you want to include the Krumbo Reservoir maintenance water, please amend Transfer Application 8309 to include this use and place of use. Please amend Transfer Application 8312 to show the correct authorized point of diversion. Please amend Transfer Application 8312 to include the quantity of stock water to be included in this transfer application. And, please include a list proposed points of diversion for all four applications along with the request to amend the applications to include the changes in points of diversion.

You will also need to have your certified Water Right Examiner amend the application maps to show the correct location for the Bridge Creek Canal diversion and the Diamond Canal diversion. For convenience, the old Diamond Canal diversion could be shown as an insert on either map 4 or map 8. The corrected map would not need to show the intervening lands.

We are not returning your applications. Please request your application amendments and authorize any necessary correction in a letter, with attachments as needed. Please have your certified Water Right Examiner submit only the corrected map, not the entire set. Please submit the corrections and amendments within 60 days.

For your information, from our review so far, we have determined that we will likely impose the following conditions on the transfer approval. We will require measuring devices be installed and maintained on all diversions. We will require the total quantities diverted be added together and no more water be used than the total rate and duty allowed by the resulting rights. We will require flow and volume figures be reported to the Watermaster upon request. We will also propose a condition that, under the Wildlife Refuge Use, no more land may be irrigated than was being irrigated at the time of transfer approval. And, we will propose a condition that any refuge water management plans be shared with the Watermaster.

These requested changes may or may not require additional fees. If they do require additional fees, we will notify you prior to approval of the transfers. If there are fees to be refunded, we will refund any unearned fees after approval of the transfers.

If you have an questions, please call me at (503) 378-8455, ext. 275, or (800) 624-3199 (in-state only).

Sincerely,

LARRY H. NUNN
Transfer Coordinator

cc: Mitch Lewis, Watermaster

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

August 30, 1999

Andy Dunbar
HCR 72, Box 200E
Princeton, OR 97721

REFERENCE: Transfer 8309, 8310, 8311, and 8312

We received the protest form you submitted. However, we are not able to accept the protest.

Under the law, once the application is complete, we may only review it for injury to another water right. We may only accept a protests which alleges injury to another water right.

Your protest does not specify which water right would be injured. Nor does it specify how the unidentified water right would be injured.

Injury, in general terms, means than the change requested by the transfer application would cause some other water right to not receive the water it is legally and customarily entitled to.

We are returning your protest, along with your check for $ 25.00.

If you have an questions, please call me at (503) 378-8455, ext. 275, or (800) 624-3199 (in-state only).

Sincerely,

LARRY H. NUNN
Transfer Coordinator

cc: Mitch Lewis, Watermaster
Paul Rauch, USFWS

T-8311

State of Oregon
WATER RESOURCES DEPARTMENT

RECEIVED
JUL 28 1999
WATER RESOURCES DEPT.
SALEM, OREGON

APPLICATION FOR TRANSFER OF WATER RIGHT

Applicant: **U.S. Fish and Wildlife Service**

Mailing Address: **911 NE 11th Avenue**

Portland	**Oregon**	**97232-4181**	**(503) 231-6251**
(City or town)	(State)	(Zip)	(Phone)

Type of Change: **place of use; use heretofore made of the water**
(in point of diversion; place of use; use heretofore made of the water)

1. **WATER RIGHT**

A) Is the water right in your name? **YES** (YES, NO) If not, list name below:

B) Was the water right determined by a court decree? **YES** (YES, NO)

1. If yes, list the title of the proceedings: **In the matter of the Determination of the Relative Rights to the Use of the Waters of Donner und Blitzen River and its Tributaries, a Tributary of Malheur Lake, No. 3355 (Circuit Court, Harney County, Oregon)**

2. Certificate No: **15197**

C) Was the water right acquired by a water permit? **NO**

1. If yes, list the Permit No: **N/A**

D) Date of priority right: **1885** ,19____

E) What are your reasons for the proposed changes?
To better reflect Malheur National Wildlife Refuge's water needs.

F) The water will be completely applied to the proposed use on or before: **Immediately** , 19 ____

2 **LOCATION OF AUTHORIZED USE**

A) What is the source of the water (river, stream, well)? **Donner und Blitzen River**

B) Describe the authorized point of diversion:

Location in Reference to Survey Corner	¼,¼ of Section	Section	Township	Range
2527 ft West, 1436 ft North of the SE Corner of Section 15	**NWSE**	**15**	**27 S**	**31 E**

C) What is the name of the ditch used? **Carevari Ditch**

D) What is the use to which the water is applied? **Irrigation, domestic, and stock**

E) Give the location of the authorized area irrigated or place of use other than for irrigation:

Township	Range	Section	¼,¼ of Section	Number of acres irrigated
27 S	**31 E**	**15**	**NWSE**	**33.7**
27 S	**31 E**	**15**	**SWSE**	**23.9**
27 S	**31 E**	**15**	**NESE**	**23.8**
27 S	**31 E**	**15**	**SESE**	**2.0**

F) Is the land within an irrigation district? Yes ____ No **X**
If Yes, which district?

G) County **Harney**

3. **LOCATION OF PROPOSED USE:**

Note: Answer question A **only** if the application is for a change in the point of diversion.

A) Describe the proposed point of diversion:

Location in Reference to Survey Center	¼,¼ of Section	Section	Township	Range
N/A				

NOTE: Answer questions B, C, D, and E **only** if the application is for a change in use or place of use.

B) Are the lands from which you propose to transfer your water right free of all encumbrances? **YES** (Yes, No)

C) If no, give the description below of existing encumbrances:

Encumbrance	Held by	Amount
N/A		

D) What is the use to which the water will be applied? **Wildlife refuge management: Uses include, but are not limited to wildlife, aquatic life, wetland enhancement, riparian area enhancement, fire control, domestic, irrigation, stock water, recreation, construction, and dust control**

E) Give the proposed location of the area irrigated, or place of use if other than for irrigation:

Township	Range	Section	¼,¼ of Section	No. of acres irrigated
Please see Attachment C				

4. **EXHIBITS**

The following exhibits **shall** be attached to and made part of the application:

A) A **map** prepared by a certified water right examiner showing the location of the present and proposed points of diversion, the authorized and proposed places of use and, if any, lands from the existing right that would not be subject to transfer.

B) A copy of the current recorded **deed** to the subject lands.

C) **Affidavits** from any other landowners or encumbrance holders with interest in the original water right stating that they have no objection to the proposed transfer.

D) **Evidence** that the water has been used within the last five years.

5. **Name and Address of Receiving Landowners(s)** If other than applicant:

N/A

6. **REMARKS: None**

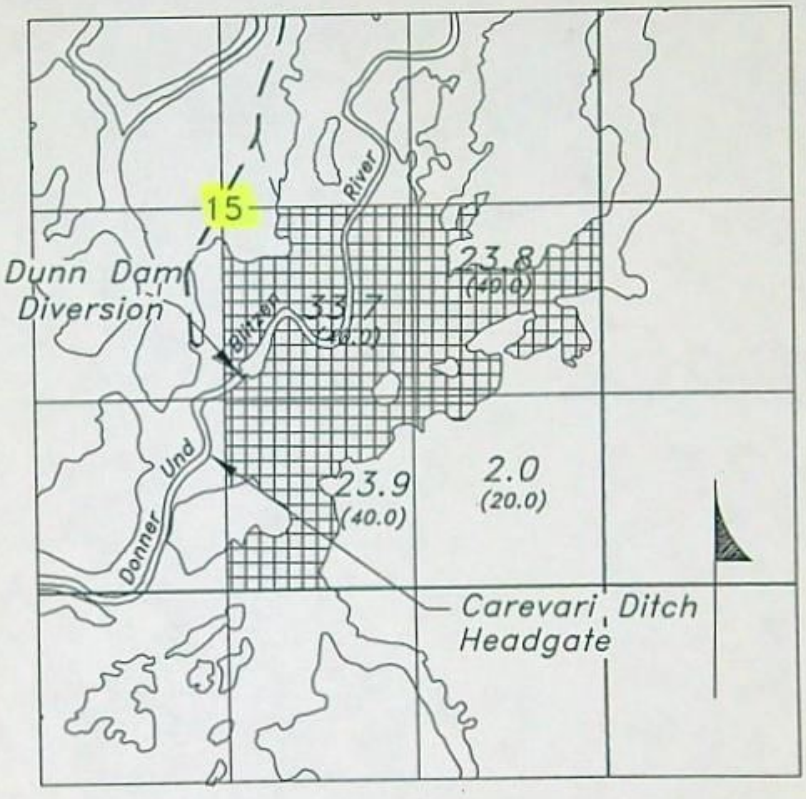
I (we), Paul Rauch, Agent for U.S. Fish and Wildlife Service applicants, hereby swear that I (we) have read the above application for transfer of water right and that the statements made are true and correct. Dated and signed this 27th day of July ,19 99.

(Signature)

(Signature)

TRANSFER APPLICATION MAP

AUTHORIZED PLACE OF USE FOR CERTIFICATE 15197
IN THE NAME OF: U.S. FISH AND WILDLIFE SERVICE
SE 1/4, Section 15, T. 27 S., R. 31 E., W.M.
HARNEY COUNTY, OREGON



0 660 1320 2640 3960 5280 FEET

1 INCH = 1320 FEET

Dunn Dam Point of Diversion is 2527 feet West and 1436 feet North of the Southeast Corner of Section 15, T. 27 S., R. 31 E., W.M.

40.0 — Actual Irrigated Acres
(40.0) — Certificated Water Right Acres

Acreages Proposed for Transfer
(Lesser of the Actual Irrigated Acres and Certificated Water Right Acres)

T-8311

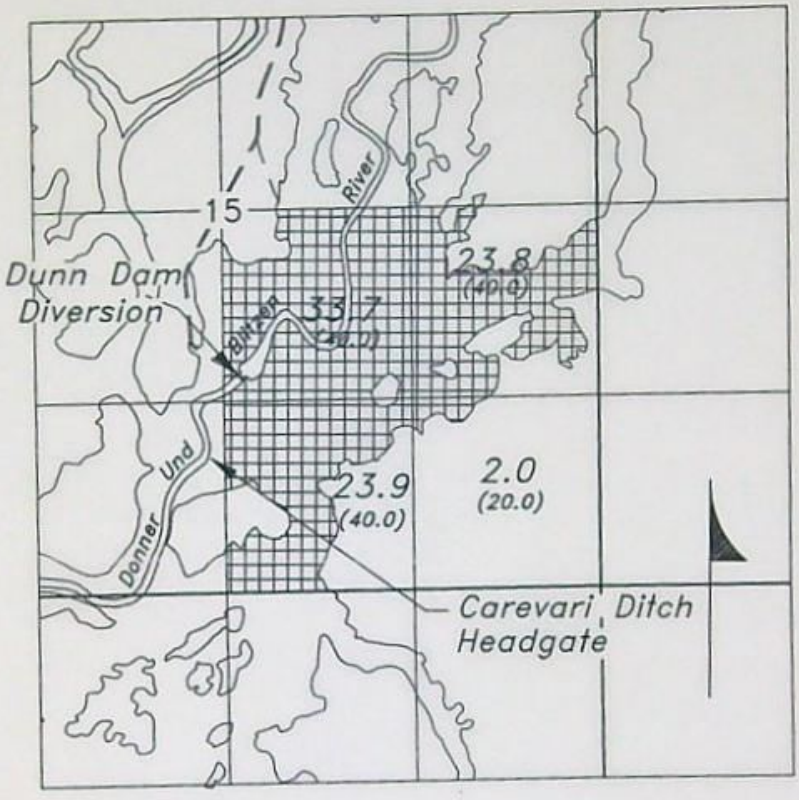
THE PURPOSE OF THIS MAP IS TO IDENTIFY THE LOCATION OF THE WATER RIGHT. IT IS NOT INTENDED TO PROVIDE INFORMATION RELATIVE TO THE LOCATION OF PROPERTY OWNERSHIP BOUNDARY LINES.

Certified Water Right Examiner
299WRE
ROBERT W. GLAESER
NOV. 19, 1991
STATE OF OREGON

7/22/99

TRANSFER APPLICATION MAP

AUTHORIZED PLACE OF USE FOR CERTIFICATE 15197
IN THE NAME OF: U.S. FISH AND WILDLIFE SERVICE
SE 1/4, Section 15, T. 27 S., R. 31 E., W.M.
HARNEY COUNTY, OREGON



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(40.0) — Certificated Water Right Acres

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(Lesser of the Actual Irrigated Acres and Certificated Water Right Acres)

T-8311

THE PURPOSE OF THIS MAP IS TO IDENTIFY THE LOCATION OF THE WATER RIGHT. IT IS NOT INTENDED TO PROVIDE INFORMATION RELATIVE TO THE LOCATION OF PROPERTY OWNERSHIP BOUNDARY LINES.

Certified Water Right Examiner
256WRE
ROBERT W. GLAESER
NOV. 19, 1991
STATE OF OREGON

7/22/99

T-8311

Warranty Deed

Application for Transfer of Water Right (Certificate 15197)

OCT 15 1998
1700/124 ✓ 13-129
2731

JUL 28 1999
WATER RESOURCES DEPT.
SALEM, OREGON

981883

STATE OF OREGON
County of Harney } ss
I certify that the within instrument was received for record on the 15 day of October 1998, at 2:10 o'clock P.M. and recorded Microfilm number 981883 Deed Records of said County.
Maria Iturriaga, County Clerk
By Maria Iturriaga Deputy

WARRANTY DEED

The Grantor, Canevari Timber Company, Inc., a California Corporation, hereby conveys and warrants to the UNITED STATES OF AMERICA and its assigns, the following described real property located in the County of Harney, State of Oregon, to-wit:

H13558

In Township 27 South, Range 31 East, Willamette Meridian:
Section 15: S½.

TOGETHER WITH the Grantor's right, title, and interest in and to all mineral and water rights appurtenant to said property.

TO HAVE AND TO HOLD the above described premises together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging, or in anywise appertaining, unto the UNITED STATES OF AMERICA and its assigns, forever.

The grantor hereby covenants to and with the UNITED STATES and its assigns that the grantor is lawfully seized in fee simple of the above granted real property, has a good and lawful right and power to sell and convey the same, that the same is free and clear of all encumbrances, except as shown above, and that the grantors will forever warrant and defend the title thereto and the quiet possession thereof against the lawful claims and demands of all persons whomsoever.

The true consideration for this conveyance is $325,000.00.

Affidavit of Forrest Cameron

Application for Transfer of Water Right
(Certificates 14367, 15197, 15198, and 28524,)

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

IN THE MATTER OF WATER USE AT MALHEUR NATIONAL WILDLIFE REFUGE UNDER WATER RIGHT CERTIFICATES 14367, 15197, 15198, and 28524.	AFFIDAVIT OF FORREST CAMERON

AFFIDAVIT

I, Forrest Cameron, first being sworn on oath, depose and state:

1. I have been employed by the U.S. Fish and Wildlife Service since June 1969. I was Project Leader at Malheur National Wildlife Refuge (Refuge) from October 1989 through January 1999.

2. As Project Leader I was responsible for the overall management of the Refuge and I am familiar with the water use practices at the Refuge.

3. I have been involved with the preparation of maps depicting the irrigated lands in the Blitzen Valley portion of the Refuge.

4. I have reviewed these maps and to the best of my knowledge and belief they accurately represent that portion of the authorized place of use irrigated during the past five years under Certificates 14367, 15197, 15198, and 28524.

Further affiant saith not.

Forrest Cameron
U.S. Fish and Wildlife Service
911 NE 11th Avenue
Portland, Oregon 97232-4181

Dated: July 21, 1999

STATE OF Oregon)
COUNTY OF Multnomah)

The affiant, Forrest Cameron, being first duly sworn by me, hereby declares that he has read the foregoing Affidavit and that the information contained therein is true and accurate to the best of his knowledge and belief.

Subscribed and sworn/affirmed to before me by Forrest Cameron this 21st day of July 1999.

NOTARY PUBLIC

(Seal) OFFICIAL SEAL
BERNIE LOGAN
NOTARY PUBLIC-OREGON
COMMISSION NO. 316961
MY COMMISSION EXPIRES OCT 14, 2002

My commission Expires: 10/14/02

T - ~~8310~~
8311

Affidavit of Forrest Cameron

Application for Transfer of Water Right
(Certificates 14367, 15197, 15198, and 28524,)

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

IN THE MATTER OF WATER USE AT MALHEUR NATIONAL WILDLIFE REFUGE UNDER WATER RIGHT CERTIFICATES 14367, 15197, 15198, and 28524.	AFFIDAVIT OF FORREST CAMERON

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Further affiant saith not.

Forrest Cameron
U.S. Fish and Wildlife Service
911 NE 11th Avenue
Portland, Oregon 97232-4181

Dated: July 21, 1999

STATE OF Oregon)
COUNTY OF Multnomah)

The affiant, Forrest Cameron, being first duly sworn by me, hereby declares that he has read the foregoing Affidavit and that the information contained therein is true and accurate to the best of his knowledge and belief.

Subscribed and sworn/affirmed to before me by Forrest Cameron this 21st day of July 1999.

NOTARY PUBLIC

(Seal) OFFICIAL SEAL
BERNIE LOGAN
NOTARY PUBLIC-OREGON
COMMISSION NO. 316961
MY COMMISSION EXPIRES OCT 14, 2002

My commission Expires: 10/14/02

T-8311

Attachment C

Proposed Location of the Place of Use.

Township	Range	Section	Qtr/Qtr
T26S	R31E	34	NWSW
T26S	R31E	34	SWSW
T27S	R30E	25	NWSE
T27S	R30E	25	SWSE
T27S	R30E	25	SENE
T27S	R30E	25	NESE
T27S	R30E	25	SESE
T27S	R30E	36	NWNE
T27S	R30E	36	SWNE
T27S	R30E	36	NENE
T27S	R30E	36	SENE
T27S	R31E	2	NWNW
T27S	R31E	2	SWNW
T27S	R31E	2	NWSW
T27S	R31E	2	SWSW
T27S	R31E	2	NENW
T27S	R31E	3	NWNW
T27S	R31E	3	SWNW
T27S	R31E	3	NWSW
T27S	R31E	3	SWSW
T27S	R31E	3	NENW
T27S	R31E	3	SENW
T27S	R31E	3	NESW
T27S	R31E	3	SESW
T27S	R31E	3	NWNE
T27S	R31E	3	SWNE
T27S	R31E	3	NWSE
T27S	R31E	3	SWSE
T27S	R31E	3	NENE
T27S	R31E	3	SENE
T27S	R31E	3	NESE
T27S	R31E	3	SESE
T27S	R31E	10	NWNW
T27S	R31E	10	SWNW
T27S	R31E	10	NWSW
T27S	R31E	10	SWSW
T27S	R31E	10	NENW
T27S	R31E	10	SENW
T27S	R31E	10	NESW
T27S	R31E	10	SESW
T27S	R31E	10	NWNE
T27S	R31E	10	SWNE
T27S	R31E	10	NWSE
T27S	R31E	10	SWSE
T27S	R31E	10	NENE
T27S	R31E	10	SENE
T27S	R31E	10	NESE
T27S	R31E	10	SESE
T27S	R31E	11	NWNW
T27S	R31E	11	SWNW
T27S	R31E	11	NWSW
T27S	R31E	11	SWSW
T27S	R31E	14	NWNW
T27S	R31E	14	SWNW
T27S	R31E	14	NWSW
T27S	R31E	14	SWSW
T27S	R31E	15	NWNW
T27S	R31E	15	SWNW
T27S	R31E	15	NENW
T27S	R31E	15	SENW
T27S	R31E	15	NWNE
T27S	R31E	15	SWNE

Township	Range	Section	Qtr/Qtr
T27S	R31E	15	NENE
T27S	R31E	15	SENE
T27S	R31E	15	NWSW
T27S	R31E	15	SWSW
T27S	R31E	15	NESW
T27S	R31E	15	SESW
T27S	R31E	15	NWSE
T27S	R31E	15	SWSE
T27S	R31E	15	NESE
T27S	R31E	15	SESE
T27S	R31E	4	NWNW
T27S	R31E	4	SWNW
T27S	R31E	4	NWSW
T27S	R31E	4	SWSW
T27S	R31E	4	NENW
T27S	R31E	4	SENW
T27S	R31E	4	NESW
T27S	R31E	4	SESW
T27S	R31E	4	NWNE
T27S	R31E	4	SWNE
T27S	R31E	4	NWSE
T27S	R31E	4	SWSE
T27S	R31E	4	NENE
T27S	R31E	4	SENE
T27S	R31E	4	NESE
T27S	R31E	4	SESE
T27S	R31E	8	SWSE
T27S	R31E	8	SESE
T27S	R31E	9	NWNW
T27S	R31E	9	SWNW
T27S	R31E	9	NWSW
T27S	R31E	9	SWSW
T27S	R31E	9	NENW
T27S	R31E	9	SENW
T27S	R31E	9	NESW
T27S	R31E	9	SESW
T27S	R31E	9	NWNE
T27S	R31E	9	SWNE
T27S	R31E	9	NWSE
T27S	R31E	9	SWSE
T27S	R31E	9	NENE
T27S	R31E	9	SENE
T27S	R31E	9	NESE
T27S	R31E	9	SESE
T27S	R31E	16	NWNW
T27S	R31E	16	SWNW
T27S	R31E	16	NWSW
T27S	R31E	16	SWSW
T27S	R31E	16	NENW
T27S	R31E	16	SENW
T27S	R31E	16	NESW
T27S	R31E	16	SESW
T27S	R31E	16	NWNE
T27S	R31E	16	SWNE
T27S	R31E	16	NWSE
T27S	R31E	16	SWSE
T27S	R31E	16	NENE
T27S	R31E	16	SENE
T27S	R31E	16	NESE
T27S	R31E	16	SESE
T27S	R31E	17	SWSW
T27S	R31E	17	NWNW
T27S	R31E	17	SWNW
T27S	R31E	17	NWSW
T27S	R31E	17	NENW
T27S	R31E	17	SENW
T27S	R31E	17	NWNE
T27S	R31E	17	SWNE

Township	Range	Section	Qtr/Qtr
T27S	R31E	17	NESW
T27S	R31E	17	SESW
T27S	R31E	17	NWSE
T27S	R31E	17	SWSE
T27S	R31E	17	NENE
T27S	R31E	17	SENE
T27S	R31E	17	NESE
T27S	R31E	17	SESE
T27S	R31E	18	SESW
T27S	R31E	18	NWSE
T27S	R31E	18	SWSE
T27S	R31E	18	NESE
T27S	R31E	18	SESE
T27S	R31E	19	NWNW
T27S	R31E	19	SWNW
T27S	R31E	19	NWSW
T27S	R31E	19	SWSW
T27S	R31E	19	NENW
T27S	R31E	19	SENW
T27S	R31E	19	NESW
T27S	R31E	19	SESW
T27S	R31E	19	NWNE
T27S	R31E	19	SWNE
T27S	R31E	19	NWSE
T27S	R31E	19	SWSE
T27S	R31E	19	NENE
T27S	R31E	19	SENE
T27S	R31E	19	NESE
T27S	R31E	19	SESE
T27S	R31E	20	NWNW
T27S	R31E	20	SWNW
T27S	R31E	20	NWSW
T27S	R31E	20	SWSW
T27S	R31E	20	NENW
T27S	R31E	20	SENW
T27S	R31E	20	NESW
T27S	R31E	20	SESW
T27S	R31E	20	NWNE
T27S	R31E	20	SWNE
T27S	R31E	20	NWSE
T27S	R31E	20	SWSE
T27S	R31E	20	NENE
T27S	R31E	20	SENE
T27S	R31E	20	NESE
T27S	R31E	20	SESE
T27S	R31E	21	NWNW
T27S	R31E	21	SWNW
T27S	R31E	21	NWSW
T27S	R31E	21	SWSW
T27S	R31E	21	NENW
T27S	R31E	21	SENW
T27S	R31E	21	NESW
T27S	R31E	21	SESW
T27S	R31E	21	NWNE
T27S	R31E	21	SWNE
T27S	R31E	21	NWSE
T27S	R31E	21	SWSE
T27S	R31E	21	NENE
T27S	R31E	21	SENE
T27S	R31E	21	NESE
T27S	R31E	21	SESE
T27S	R31E	28	NWNW
T27S	R31E	28	SWNW
T27S	R31E	28	NWSW
T27S	R31E	28	SWSW
T27S	R31E	28	NENW
T27S	R31E	28	SENW
T27S	R31E	28	NESW

Township	Range	Section	Qtr/Qtr
T27S	R31E	28	SESW
T27S	R31E	28	NWNE
T27S	R31E	28	SWNE
T27S	R31E	28	NWSE
T27S	R31E	28	SWSE
T27S	R31E	28	NENE
T27S	R31E	28	SENE
T27S	R31E	28	NESE
T27S	R31E	28	SESE
T27S	R31E	29	NWNW
T27S	R31E	29	SWNW
T27S	R31E	29	NWSW
T27S	R31E	29	SWSW
T27S	R31E	29	NENW
T27S	R31E	29	SENW
T27S	R31E	29	NESW
T27S	R31E	29	SESW
T27S	R31E	29	NWNE
T27S	R31E	29	SWNE
T27S	R31E	29	NWSE
T27S	R31E	29	SWSE
T27S	R31E	29	NENE
T27S	R31E	29	SENE
T27S	R31E	29	NESE
T27S	R31E	29	SESE
T27S	R31E	30	NWNW
T27S	R31E	30	SWNW
T27S	R31E	30	NWSW
T27S	R31E	30	SWSW
T27S	R31E	30	NENW
T27S	R31E	30	SENW
T27S	R31E	30	NESW
T27S	R31E	30	SESW
T27S	R31E	30	NWNE
T27S	R31E	30	SWNE
T27S	R31E	30	NWSE
T27S	R31E	30	SWSE
T27S	R31E	30	NENE
T27S	R31E	30	SENE
T27S	R31E	30	NESE
T27S	R31E	30	SESE
T27S	R31E	31	NWNW
T27S	R31E	31	SWNW
T27S	R31E	31	NWSW
T27S	R31E	31	SWSW
T27S	R31E	31	NENW
T27S	R31E	31	SENW
T27S	R31E	31	NESW
T27S	R31E	31	SESW
T27S	R31E	31	NWNE
T27S	R31E	31	SWNE
T27S	R31E	31	NWSE
T27S	R31E	31	SWSE
T27S	R31E	31	NENE
T27S	R31E	31	SENE
T27S	R31E	31	NESE
T27S	R31E	31	SESE
T27S	R31E	32	NWNW
T27S	R31E	32	SWNW
T27S	R31E	32	NWSW
T27S	R31E	32	SWSW
T27S	R31E	32	NENW
T27S	R31E	32	SENW
T27S	R31E	32	NESW
T27S	R31E	32	SESW
T27S	R31E	32	NWNE
T27S	R31E	32	SWNE
T27S	R31E	32	NWSE

Township	Range	Section	Qtr/Qtr
T27S	R31E	32	SWSE
T27S	R31E	32	NENE
T27S	R31E	32	SENE
T27S	R31E	32	NESE
T27S	R31E	32	SESE
T27S	R31E	33	NWNW
T27S	R31E	33	SWNW
T27S	R31E	33	NWSW
T27S	R31E	33	SWSW
T27S	R31E	33	NENW
T27S	R31E	33	SENW
T27S	R31E	33	NESW
T27S	R31E	33	SESW
T27S	R31E	33	NWNE
T27S	R31E	33	SWNE
T27S	R31E	33	NWSE
T27S	R31E	33	SWSE
T27S	R31E	33	NENE
T27S	R31E	33	SENE
T27S	R31E	33	NESE
T27S	R31E	33	SESE
T27S	R31E	22	NWNW
T27S	R31E	22	SWNW
T27S	R31E	22	NWSW
T27S	R31E	22	SWSW
T27S	R31E	22	NENW
T27S	R31E	22	SENW
T27S	R31E	22	NESW
T27S	R31E	22	SESW
T27S	R31E	22	NWNE
T27S	R31E	22	SWNE
T27S	R31E	22	NWSE
T27S	R31E	22	SWSE
T27S	R31E	22	NENE
T27S	R31E	22	SENE
T27S	R31E	22	NESE
T27S	R31E	22	SESE
T27S	R31E	23	NWNW
T27S	R31E	23	SWNW
T27S	R31E	23	NWSW
T27S	R31E	23	SWSW
T27S	R31E	23	SESW
T27S	R31E	23	SENW
T27S	R31E	23	NESW
T27S	R31E	26	NWNW
T27S	R31E	26	SWNW
T27S	R31E	26	NWSW
T27S	R31E	26	SWSW
T27S	R31E	26	NENW
T27S	R31E	26	SENW
T27S	R31E	26	NESW
T27S	R31E	26	SESW
T27S	R31E	27	NWNW
T27S	R31E	27	SWNW
T27S	R31E	27	NWSW
T27S	R31E	27	SWSW
T27S	R31E	27	NENW
T27S	R31E	27	SENW
T27S	R31E	27	NESW
T27S	R31E	27	SESW
T27S	R31E	27	NWNE
T27S	R31E	27	SWNE
T27S	R31E	27	NWSE
T27S	R31E	27	SWSE
T27S	R31E	27	NENE
T27S	R31E	27	SENE
T27S	R31E	27	NESE
T27S	R31E	27	SESE

Township	Range	Section	Qtr/Qtr
T27S	R31E	34	NWNW
T27S	R31E	34	SWNW
T27S	R31E	34	NWSW
T27S	R31E	34	SWSW
T27S	R31E	34	NENW
T27S	R31E	34	SENW
T27S	R31E	34	NESW
T27S	R31E	34	SESW
T27S	R31E	34	NWNE
T27S	R31E	34	SWNE
T27S	R31E	34	NWSE
T27S	R31E	34	SWSE
T27S	R31E	34	NENE
T27S	R31E	34	SENE
T27S	R31E	34	NESE
T27S	R31E	34	SESE
T27S	R31E	35	NWNW
T27S	R31E	35	SWNW
T27S	R31E	35	NWSW
T27S	R31E	35	SWSW
T27S	R31E	35	NENW
T27S	R31E	35	SENW
T28S	R31E	4	NWNW
T28S	R31E	4	SWNW
T28S	R31E	4	NWSW
T28S	R31E	4	SWSW
T28S	R31E	4	NENW
T28S	R31E	4	SENW
T28S	R31E	4	NESW
T28S	R31E	4	SESW
T28S	R31E	4	NWNE
T28S	R31E	4	SWNE
T28S	R31E	4	NWSE
T28S	R31E	4	SWSE
T28S	R31E	4	NENE
T28S	R31E	4	SENE
T28S	R31E	4	NESE
T28S	R31E	4	SESE
T28S	R31E	5	NWNW
T28S	R31E	5	SWNW
T28S	R31E	5	NWSW
T28S	R31E	5	SWSW
T28S	R31E	5	NENW
T28S	R31E	5	SENW
T28S	R31E	5	NESW
T28S	R31E	5	SESW
T28S	R31E	5	NWNE
T28S	R31E	5	SWNE
T28S	R31E	5	NWSE
T28S	R31E	5	SWSE
T28S	R31E	5	NENE
T28S	R31E	5	SENE
T28S	R31E	5	NESE
T28S	R31E	5	S6SE
T28S	R31E	6	NWNW
T28S	R31E	6	SWNW
T28S	R31E	6	NENW
T28S	R31E	6	SENW
T28S	R31E	6	NWNE
T28S	R31E	6	SWNE
T28S	R31E	6	NENE
T28S	R31E	6	SENE
T28S	R31E	6	NESE
T28S	R31E	6	SESE
T28S	R31E	7	NENE
T28S	R31E	7	SENE
T28S	R31E	7	NESE

Township	Range	Section	Qtr/Qtr
T28S	R31E	7	SESE
T28S	R31E	8	NWNW
T28S	R31E	8	SWNW
T28S	R31E	8	NWSW
T28S	R31E	8	SWSW
T28S	R31E	8	NENW
T28S	R31E	8	SENW
T28S	R31E	8	NESW
T28S	R31E	8	SESW
T28S	R31E	8	NWNE
T28S	R31E	8	SWNE
T28S	R31E	8	NWSE
T28S	R31E	8	SWSE
T28S	R31E	8	NENE
T28S	R31E	8	SENE
T28S	R31E	8	NESE
T28S	R31E	8	SESE
T28S	R31E	9	NWNW
T28S	R31E	9	SWNW
T28S	R31E	9	NWSW
T28S	R31E	9	SWSW
T28S	R31E	9	NENW
T28S	R31E	9	SENW
T28S	R31E	9	NESW
T28S	R31E	9	SESW
T28S	R31E	9	NWNE
T28S	R31E	9	SWNE
T28S	R31E	9	NWSE
T28S	R31E	9	SWSE
T28S	R31E	9	NENE
T28S	R31E	9	SENE
T28S	R31E	9	NESE
T28S	R31E	9	SESE
T28S	R31E	16	NWNW
T28S	R31E	16	SWNW
T28S	R31E	16	NWSW
T28S	R31E	16	SWSW
T28S	R31E	16	NENW
T28S	R31E	16	SENW
T28S	R31E	16	NESW
T28S	R31E	16	SESW
T28S	R31E	16	NWSE
T28S	R31E	16	SWSE
T28S	R31E	16	NWNE
T28S	R31E	16	SWNE
T28S	R31E	16	SENE
T28S	R31E	16	NESE
T28S	R31E	16	NENE
T28S	R31E	16	SESE
T28S	R31E	17	NWNW
T28S	R31E	17	SWNW
T28S	R31E	17	NWSW
T28S	R31E	17	SWSW
T28S	R31E	17	NENW
T28S	R31E	17	SENW
T28S	R31E	17	NESW
T28S	R31E	17	SESW
T28S	R31E	17	NWNE
T28S	R31E	17	SWNE
T28S	R31E	17	NWSE
T28S	R31E	17	SWSE
T28S	R31E	17	NENE
T28S	R31E	17	SENE
T28S	R31E	17	NESE
T28S	R31E	17	SESE
T28S	R31E	18	SESE
T28S	R31E	18	NENE
T28S	R31E	18	SENE

Township	Range	Section	Qtr/Qtr
T28S	R31E	18	NESE
T28S	R31E	3	NWNW
T28S	R31E	3	SWNW
T28S	R31E	3	NWSW
T28S	R31E	3	SWSW
T28S	R31E	3	NENW
T28S	R31E	3	SENW
T28S	R31E	3	NESW
T28S	R31E	3	SESW
T28S	R31E	3	NWNE
T28S	R31E	3	SWNE
T28S	R31E	3	NWSE
T28S	R31E	3	SWSE
T28S	R31E	3	NENE
T28S	R31E	3	SENE
T28S	R31E	10	NWNW
T28S	R31E	10	SWNW
T28S	R31E	10	NWSW
T28S	R31E	10	SWSW
T28S	R31E	10	NENW
T28S	R31E	10	SENW
T28S	R31E	10	NESW
T28S	R31E	10	SESW
T28S	R31E	10	NWNE
T28S	R31E	15	NWNW
T28S	R31E	15	SWNW
T28S	R31E	15	NWSW
T28S	R31E	15	SWSW
T28S	R31E	15	NENW
T28S	R31E	15	SENW
T28S	R31E	15	NESW
T28S	R31E	15	SESW
T28S	R31E	22	NWNW
T28S	R31E	22	SWNW
T28S	R31E	22	NWSW
T28S	R31E	22	SWSW
T28S	R31E	22	NENW
T28S	R31E	22	SENW
T28S	R31E	22	NESW
T28S	R31E	22	SESW
T28S	R31E	22	NWNE
T28S	R31E	22	SWNE
T28S	R31E	22	NWSE
T28S	R31E	22	SWSE
T28S	R31E	22	NENE
T28S	R31E	22	SENE
T28S	R31E	22	NESE
T28S	R31E	22	SESE
T28S	R31E	23	SWNW
T28S	R31E	23	NWSW
T28S	R31E	23	SWSW
T28S	R31E	23	NESW
T28S	R31E	23	SESW
T28S	R31E	25	NWNW
T28S	R31E	25	SWNW
T28S	R31E	25	NWSW
T28S	R31E	25	SWSW
T28S	R31E	25	SENW
T28S	R31E	25	NESW
T28S	R31E	25	SESW
T28S	R31E	25	SWNE
T28S	R31E	25	NWSE
T28S	R31E	25	SWSE
T28S	R31E	25	SESE
T28S	R31E	26	NWNW
T28S	R31E	26	SWNW
T28S	R31E	26	NWSW
T28S	R31E	26	SWSW

Township	Range	Section	Qtr/Qtr
T28S	R31E	26	NENW
T28S	R31E	26	SENW
T28S	R31E	26	NESW
T28S	R31E	26	SESW
T28S	R31E	26	NWNE
T28S	R31E	26	SWNE
T28S	R31E	26	NWSE
T28S	R31E	26	SWSE
T28S	R31E	26	NENE
T28S	R31E	26	SENE
T28S	R31E	26	NESE
T28S	R31E	26	SESE
T28S	R31E	27	NWNW
T28S	R31E	27	SWNW
T28S	R31E	27	NWSW
T28S	R31E	27	SWSW
T28S	R31E	27	NENW
T28S	R31E	27	SENW
T28S	R31E	27	NESW
T28S	R31E	27	SESW
T28S	R31E	27	NWNE
T28S	R31E	27	SWNE
T28S	R31E	27	NWSE
T28S	R31E	27	SWSE
T28S	R31E	27	NENE
T28S	R31E	27	SENE
T28S	R31E	27	NESE
T28S	R31E	27	SESE
T28S	R31E	34	NWNW
T28S	R31E	34	SWNW
T28S	R31E	34	NWSW
T28S	R31E	34	SWSW
T28S	R31E	34	NENW
T28S	R31E	34	SENW
T28S	R31E	34	NESW
T28S	R31E	34	SESW
T28S	R31E	34	NWNE
T28S	R31E	34	SWNE
T28S	R31E	34	NWSE
T28S	R31E	34	SWSE
T28S	R31E	34	NENE
T28S	R31E	34	SENE
T28S	R31E	34	NESE
T28S	R31E	34	SESE
T28S	R31E	35	NWNW
T28S	R31E	35	SWNW
T28S	R31E	35	NWSW
T28S	R31E	35	SWSW
T28S	R31E	35	NENW
T28S	R31E	35	SENW
T28S	R31E	35	NESW
T28S	R31E	35	SESW
T28S	R31E	35	NWNE
T28S	R31E	35	SWNE
T28S	R31E	35	NWSE
T28S	R31E	35	SWSE
T28S	R31E	35	NENE
T28S	R31E	35	SENE
T28S	R31E	35	NESE
T28S	R31E	35	SESE
T28S	R31E	36	NWNW
T28S	R31E	36	SWNW
T28S	R31E	36	NWSW
T28S	R31E	36	SWSW
T28S	R31E	36	NENW
T28S	R31E	36	SENW
T28S	R31E	36	NESW
T28S	R31E	36	SESW

Township	Range	Section	Qtr/Qtr
T28S	R31E	36	NWNE
T28S	R31E	36	SWNE
T28S	R31E	36	NWSE
T28S	R31E	36	SWSE
T28S	R31E	36	NENE
T28S	R31E	19	NENE
T28S	R31E	19	SENE
T28S	R31E	19	NESE
T28S	R31E	19	SESE
T28S	R31E	20	NWNW
T28S	R31E	20	SWNW
T28S	R31E	20	NWSW
T28S	R31E	20	SWSW
T28S	R31E	20	NENW
T28S	R31E	20	SENW
T28S	R31E	20	NESW
T28S	R31E	20	SESW
T28S	R31E	20	NWNE
T28S	R31E	20	SWNE
T28S	R31E	20	NWSE
T28S	R31E	20	SWSE
T28S	R31E	20	NENE
T28S	R31E	20	SENE
T28S	R31E	20	NESE
T28S	R31E	20	SESE
T28S	R31E	21	NWNW
T28S	R31E	21	SWNW
T28S	R31E	21	NWSW
T28S	R31E	21	SWSW
T28S	R31E	21	NENW
T28S	R31E	21	SENW
T28S	R31E	21	NESW
T28S	R31E	21	SESW
T28S	R31E	21	NWNE
T28S	R31E	21	SWNE
T28S	R31E	21	NWSE
T28S	R31E	21	SWSE
T28S	R31E	21	NENE
T28S	R31E	21	SENE
T28S	R31E	21	NESE
T28S	R31E	21	SESE
T28S	R31E	28	NWNW
T28S	R31E	28	SWNW
T28S	R31E	28	NWSW
T28S	R31E	28	SWSW
T28S	R31E	28	NENW
T28S	R31E	28	SENW
T28S	R31E	28	NESW
T28S	R31E	28	SESW
T28S	R31E	28	NWNE
T28S	R31E	28	SWNE
T28S	R31E	28	NWSE
T28S	R31E	28	SWSE
T28S	R31E	28	NENE
T28S	R31E	28	SENE
T28S	R31E	28	NESE
T28S	R31E	28	SESE
T28S	R31E	29	NWNW
T28S	R31E	29	NENW
T28S	R31E	29	SENW
T28S	R31E	29	NESW
T28S	R31E	29	SWSE
T28S	R31E	29	NWNE
T28S	R31E	29	SWNE
T28S	R31E	29	NWSE
T28S	R31E	29	NENE
T28S	R31E	29	SENE
T28S	R31E	29	NESE

Township	Range	Section	Qtr/Qtr
T28S	R31E	29	SESE
T28S	R31E	32	NENE
T28S	R31E	32	SENE
T28S	R31E	33	NWNW
T28S	R31E	33	SWNW
T28S	R31E	33	NENW
T28S	R31E	33	SENW
T28S	R31E	33	NESW
T28S	R31E	33	NWNE
T28S	R31E	33	SWNE
T28S	R31E	33	NWSE
T28S	R31E	33	SWSE
T28S	R31E	33	NENE
T28S	R31E	33	SENE
T28S	R31E	33	NESE
T28S	R31E	33	SESE
T29S	R32E	15	SWNW
T29S	R32E	15	SWNW
T29S	R32E	19	NWNW
T29S	R32E	19	SWNW
T29S	R32E	19	NWSW
T29S	R32E	19	NENW
T29S	R32E	19	SENW
T29S	R32E	19	NESW
T29S	R32E	19	SESW
T29S	R32E	19	NWNE
T29S	R32E	19	SWNE
T29S	R32E	19	NWSE
T29S	R32E	19	SWSE
T29S	R32E	19	NENE
T29S	R32E	19	SENE
T29S	R32E	19	NESE
T29S	R32E	19	SESE
T29S	R32E	20	NWNW
T29S	R32E	20	SWNW
T29S	R32E	20	NWSW
T29S	R32E	20	SWSW
T29S	R32E	20	NENW
T29S	R32E	20	SENW
T29S	R32E	20	NESW
T29S	R32E	20	SESW
T29S	R32E	20	NWNE
T29S	R32E	20	SWNE
T29S	R32E	20	NWSE
T29S	R32E	20	SWSE
T29S	R32E	20	NENE
T29S	R32E	20	SENE
T29S	R32E	20	NESE
T29S	R32E	20	SESE
T29S	R32E	21	NWNW
T29S	R32E	21	SWNW
T29S	R32E	21	NWSW
T29S	R32E	21	NENW
T29S	R32E	21	SENW
T29S	R32E	21	NESW
T29S	R32E	21	SWSW
T29S	R32E	21	SESW
T29S	R32E	21	NWSE
T29S	R32E	21	SWSE
T29S	R32E	21	SESE
T29S	R32E	29	NWNW
T29S	R32E	29	NENW
T29S	R32E	29	NWNE
T29S	R32E	30	NENE
T29S	R32E	7	SWNW
T29S	R32E	7	NWSW
T29S	R32E	7	SWSW

Township	Range	Section	Qtr/Qtr
T29S	R32E	7	SENW
T29S	R32E	7	NESW
T29S	R32E	7	SESW
T29S	R32E	7	SWNE
T29S	R32E	7	NWSE
T29S	R32E	7	SWSE
T29S	R32E	7	SENE
T29S	R32E	7	NESE
T29S	R32E	7	SESE
T29S	R32E	8	NWSW
T29S	R32E	8	SWSW
T29S	R32E	8	SESW
T29S	R32E	8	SWSE
T29S	R32E	16	SWSW
T29S	R32E	16	NENW
T29S	R32E	16	NWNE
T29S	R32E	16	SWNE
T29S	R32E	16	NENE
T29S	R32E	16	SENE
T29S	R32E	17	NWNW
T29S	R32E	17	SWNW
T29S	R32E	17	NWSW
T29S	R32E	17	SWSW
T29S	R32E	17	NENW
T29S	R32E	17	SENW
T29S	R32E	17	NESW
T29S	R32E	17	SESW
T29S	R32E	17	NWNE
T29S	R32E	17	SWNE
T29S	R32E	17	NWSE
T29S	R32E	17	SWSE
T29S	R32E	17	NENE
T29S	R32E	17	SENE
T29S	R32E	17	NESE
T29S	R32E	17	SESE
T29S	R32E	18	NWNW
T29S	R32E	18	SWNW
T29S	R32E	18	NWSW
T29S	R32E	18	SWSW
T29S	R32E	18	NENW
T29S	R32E	18	SENW
T29S	R32E	18	NESW
T29S	R32E	18	SESW
T29S	R32E	18	NWNE
T29S	R32E	18	SWNE
T29S	R32E	18	NWSE
T29S	R32E	18	SWSE
T29S	R32E	18	NENE
T29S	R32E	18	SENE
T29S	R32E	18	NESE
T29S	R32E	18	SESE
T29S	R31E	22	NENE
T29S	R31E	23	NWNW
T29S	R31E	23	SWNW
T29S	R31E	23	NENW
T29S	R31E	23	SENW
T29S	R31E	23	NESW
T29S	R31E	23	NWNE
T29S	R31E	23	SWNE
T29S	R31E	23	NWSE
T29S	R31E	23	SWSE
T29S	R31E	23	NENE
T29S	R31E	23	SENE
T29S	R31E	23	NESE
T29S	R31E	23	SESE
T29S	R31E	24	NWNW
T29S	R31E	24	SWNW

Township	Range	Section	Qtr/Qtr
T29S	R31E	24	NWSW
T29S	R31E	24	SWSW
T29S	R31E	24	NENW
T29S	R31E	24	SENW
T29S	R31E	24	NESW
T29S	R31E	24	SESW
T29S	R31E	24	NWNE
T29S	R31E	24	SWNE
T29S	R31E	24	NWSE
T29S	R31E	24	SWSE
T29S	R31E	24	NENE
T29S	R31E	24	SENE
T29S	R31E	25	NWNW
T29S	R31E	25	SWNW
T29S	R31E	25	NWSW
T29S	R31E	25	NENW
T29S	R31E	25	SENW
T29S	R31E	25	NESW
T29S	R31E	25	NWNE
T29S	R31E	25	SWNE
T29S	R31E	25	NWSE
T29S	R31E	25	SESW
T29S	R31E	25	SWSE
T29S	R31E	26	SESW
T29S	R31E	26	NWNE
T29S	R31E	26	SWNE
T29S	R31E	26	NWSE
T29S	R31E	26	SWSE
T29S	R31E	26	NENE
T29S	R31E	26	SENE
T29S	R31E	26	NESE
T29S	R31E	26	SESE
T29S	R31E	34	SESW
T29S	R31E	34	SWSE
T29S	R31E	34	NESE
T29S	R31E	34	SESE
T29S	R31E	35	NWSW
T29S	R31E	35	SWSW
T29S	R31E	35	NENW
T29S	R31E	35	SENW
T29S	R31E	35	NESW
T29S	R31E	35	SESW
T29S	R31E	35	NWNE
T29S	R31E	35	SWNE
T29S	R31E	1	NWNW
T29S	R31E	1	SWNW
T29S	R31E	1	NWSW
T29S	R31E	1	SWSW
T29S	R31E	1	NENW
T29S	R31E	1	SENW
T29S	R31E	1	NESW
T29S	R31E	1	SESW
T29S	R31E	1	NWNE
T29S	R31E	1	SWNE
T29S	R31E	1	NWSE
T29S	R31E	1	SWSE
T29S	R31E	2	NWNW
T29S	R31E	2	SWNW
T29S	R31E	2	NWSW
T29S	R31E	2	SWSW
T29S	R31E	2	NENW
T29S	R31E	2	SENW
T29S	R31E	2	NESW
T29S	R31E	2	SESW
T29S	R31E	2	NWNE
T29S	R31E	2	SWNE
T29S	R31E	2	NWSE
T29S	R31E	2	SWSE

Township	Range	Section	Qtr/Qtr
T29S	R31E	2	NENE
T29S	R31E	2	SENE
T29S	R31E	2	NESE
T29S	R31E	2	SESE
T29S	R31E	3	NWNW
T29S	R31E	3	SWNW
T29S	R31E	3	NWSW
T29S	R31E	3	SWSW
T29S	R31E	3	NENW
T29S	R31E	3	SENW
T29S	R31E	3	NESW
T29S	R31E	3	SESW
T29S	R31E	3	NWNE
T29S	R31E	3	SWNE
T29S	R31E	3	NWSE
T29S	R31E	3	SWSE
T29S	R31E	3	NENE
T29S	R31E	3	SENE
T29S	R31E	3	NESE
T29S	R31E	3	SESE
T29S	R31E	10	NWNW
T29S	R31E	10	NENW
T29S	R31E	10	SENW
T29S	R31E	10	SWNW
T29S	R31E	10	NESW
T29S	R31E	10	SESW
T29S	R31E	10	NWNE
T29S	R31E	10	SWNE
T29S	R31E	10	NWSE
T29S	R31E	10	SWSE
T29S	R31E	10	NENE
T29S	R31E	10	SENE
T29S	R31E	10	NESE
T29S	R31E	10	SESE
T29S	R31E	11	NWNW
T29S	R31E	11	SWNW
T29S	R31E	11	NWSW
T29S	R31E	11	SWSW
T29S	R31E	11	NENW
T29S	R31E	11	SENW
T29S	R31E	11	NESW
T29S	R31E	11	SESW
T29S	R31E	11	NWNE
T29S	R31E	11	SWNE
T29S	R31E	11	NWSE
T29S	R31E	11	SWSE
T29S	R31E	11	NENE
T29S	R31E	11	SENE
T29S	R31E	11	NESE
T29S	R31E	11	SESE
T29S	R31E	12	NWNW
T29S	R31E	12	SWNW
T29S	R31E	12	NWSW
T29S	R31E	12	SWSW
T29S	R31E	12	NENW
T29S	R31E	12	SENW
T29S	R31E	12	NESW
T29S	R31E	12	SESW
T29S	R31E	12	NWNE
T29S	R31E	12	SWNE
T29S	R31E	12	NWSE
T29S	R31E	12	SWSE
T29S	R31E	12	SENE
T29S	R31E	12	NESE
T29S	R31E	12	SESE
T29S	R31E	4	NWNE
T29S	R31E	4	NENE
T29S	R31E	4	SENE

Township	Range	Section	Qtr/Qtr
T29S	R31E	13	NWNW
T29S	R31E	13	SWNW
T29S	R31E	13	NWSW
T29S	R31E	13	SWSW
T29S	R31E	13	NENW
T29S	R31E	13	SENW
T29S	R31E	13	NESW
T29S	R31E	13	SESW
T29S	R31E	13	NWNE
T29S	R31E	13	SWNE
T29S	R31E	13	NWSE
T29S	R31E	13	SWSE
T29S	R31E	13	NENE
T29S	R31E	13	SENE
T29S	R31E	13	NESE
T29S	R31E	13	SESE
T29S	R31E	14	NWNW
T29S	R31E	14	SWNW
T29S	R31E	14	NWSW
T29S	R31E	14	SWSW
T29S	R31E	14	NENW
T29S	R31E	14	SENW
T29S	R31E	14	NESW
T29S	R31E	14	SESW
T29S	R31E	14	NWNE
T29S	R31E	14	SWNE
T29S	R31E	14	NWSE
T29S	R31E	14	SWSE
T29S	R31E	14	NENE
T29S	R31E	14	SENE
T29S	R31E	14	NESE
T29S	R31E	14	SESE
T29S	R31E	15	NENW
T29S	R31E	15	SENW
T29S	R31E	15	NWNE
T29S	R31E	15	SWNE
T29S	R31E	15	NWSE
T29S	R31E	15	SWSE
T29S	R31E	15	NENE
T29S	R31E	15	SENE
T29S	R31E	15	NESE
T29S	R31E	15	SESE
T30S	R32E	18	NWSW
T30S	R32E	18	NESW
T30S	R32E	18	SWSW
T30S	R32E	18	SESW
T30S	R32E	18	NWSE
T30S	R32E	18	NESE
T30S	R32E	18	SWSE
T30S	R32E	18	SESE
T30S	R32E	19	NWNW
T30S	R32E	19	SWNW
T30S	R32E	19	NENW
T30S	R32E	19	SENW
T30S	R32E	19	NWSW
T30S	R32E	19	NESW
T30S	R32E	19	NWNE
T30S	R32E	19	SWNE
T30S	R32E	19	NWSE
T30S	R32E	19	SWSE
T30S	R32E	19	NENE
T30S	R32E	19	SENE
T30S	R32E	19	SESE
T30S	R32E	19	NESE
T30S	R32E	20	NWNW
T30S	R32E	20	SWNW
T30S	R32E	20	NENW

Township	Range	Section	Qtr/Qtr
T30S	R32E	20	SENW
T30S	R32E	20	NWSW
T30S	R32E	20	SWSW
T30S	R32E	20	SESW
T30S	R32E	20	NESW
T30S	R32E	20	SWSE
T30S	R32E	20	SESE
T30S	R32E	27	SWSW
T30S	R32E	27	SWSE
T30S	R32E	27	SESW
T30S	R32E	28	NWNW
T30S	R32E	28	SENW
T30S	R32E	28	NWSE
T30S	R32E	28	SESE
T30S	R32E	29	NWNW
T30S	R32E	29	SWNW
T30S	R32E	29	NENW
T30S	R32E	29	SENW
T30S	R32E	30	NENE
T30S	R32E	33	NENE
T30S	R32E	34	NWNW
T30S	R32E	34	NWNE
T30S	R32E	34	NENE
T30S	R31E	22	NWNW
T30S	R31E	22	SWNW
T30S	R31E	22	NWSW
T30S	R31E	22	SWSW
T30S	R31E	22	NENW
T30S	R31E	22	SENW
T30S	R31E	22	NESW
T30S	R31E	22	SESW
T30S	R31E	22	NWNE
T30S	R31E	22	SWNE
T30S	R31E	22	NWSE
T30S	R31E	22	SWSE
T30S	R31E	22	NENE
T30S	R31E	22	SENE
T30S	R31E	22	NESE
T30S	R31E	22	SESE
T30S	R31E	23	NWSW
T30S	R31E	23	SWSW
T30S	R31E	23	NENE
T30S	R31E	24	NWNW
T30S	R31E	24	NENW
T30S	R31E	24	NWNE
T30S	R31E	24	NENE
T30S	R31E	24	SENE
T30S	R31E	24	SENW
T30S	R31E	24	SWNE
T30S	R31E	26	NWNW
T30S	R31E	26	SWNW
T30S	R31E	26	NWSW
T30S	R31E	26	SWSW
T30S	R31E	27	NWNW
T30S	R31E	27	SWNW
T30S	R31E	27	NWSW
T30S	R31E	27	SWSW
T30S	R31E	27	NENW
T30S	R31E	27	SENW
T30S	R31E	27	NESW
T30S	R31E	27	SESW
T30S	R31E	27	NWNE
T30S	R31E	27	SWNE
T30S	R31E	27	NWSE
T30S	R31E	27	SWSE
T30S	R31E	27	NENE
T30S	R31E	27	SENE

Township	Range	Section	Qtr/Qtr
T30S	R31E	27	NESE
T30S	R31E	27	SESE
T30S	R31E	34	NWNW
T30S	R31E	34	SWNW
T30S	R31E	34	NWSW
T30S	R31E	34	SWSW
T30S	R31E	34	NENW
T30S	R31E	34	SENW
T30S	R31E	34	NESW
T30S	R31E	34	SESW
T30S	R31E	34	NWNE
T30S	R31E	34	SWNE
T30S	R31E	34	NWSE
T30S	R31E	34	SWSE
T30S	R31E	34	NENE
T30S	R31E	34	SENE
T30S	R31E	34	NESE
T30S	R31E	34	SESE
T30S	R31E	35	NWNW
T30S	R31E	35	SWNW
T30S	R31E	35	NWSW
T30S	R31E	35	SWSW
T30S	R31E	35	NENW
T30S	R31E	35	SENW
T30S	R31E	35	NESW
T30S	R31E	35	SESW
T30S	R31E	35	NWNE
T30S	R31E	35	SWNE
T30S	R31E	35	NWSE
T30S	R31E	35	SWSE
T30S	R31E	35	SENE
T30S	R31E	35	NESE
T30S	R31E	35	SESE
T30S	R31E	21	NESE
T30S	R31E	21	SESE
T30S	R31E	28	SENE
T30S	R31E	28	NWSE
T30S	R31E	28	SWSE
T30S	R31E	28	NENE
T30S	R31E	28	SENE
T30S	R31E	28	NESE
T30S	R31E	28	SESE
T30S	R31E	33	SESW
T30S	R31E	33	NWNE
T30S	R31E	33	SWNE
T30S	R31E	33	NWSE
T30S	R31E	33	SWSE
T30S	R31E	33	NENE
T30S	R31E	33	SENE
T30S	R31E	33	NESE
T30S	R31E	33	SESE
T30S	R31E	2	SWSW
T30S	R31E	3	SWSW
T30S	R31E	3	NENW
T30S	R31E	3	SENW
T30S	R31E	3	NESW
T30S	R31E	3	SESW
T30S	R31E	3	NWNE
T30S	R31E	3	SWNE
T30S	R31E	3	NWSE
T30S	R31E	3	SWSE
T30S	R31E	3	NENE
T30S	R31E	3	SENE
T30S	R31E	3	NESE
T30S	R31E	3	SESE
T30S	R31E	10	NWNW
T30S	R31E	10	SWNW
T30S	R31E	10	NWSW

Township	Range	Section	Qtr/Qtr
T30S	R31E	10	SWSW
T30S	R31E	10	NENW
T30S	R31E	10	SENW
T30S	R31E	10	NESW
T30S	R31E	10	SESW
T30S	R31E	10	NWNE
T30S	R31E	10	SWNE
T30S	R31E	10	NWSE
T30S	R31E	10	SWSE
T30S	R31E	10	NENE
T30S	R31E	10	SENE
T30S	R31E	10	NESE
T30S	R31E	10	SESE
T30S	R31E	11	NWNW
T30S	R31E	11	SWNW
T30S	R31E	11	NWSW
T30S	R31E	11	SWSW
T30S	R31E	11	NENW
T30S	R31E	11	SENW
T30S	R31E	11	NESW
T30S	R31E	11	SESW
T30S	R31E	11	SWSE
T30S	R31E	11	SESE
T30S	R31E	12	SWSW
T30S	R31E	13	SWNW
T30S	R31E	13	NWSW
T30S	R31E	13	SWSW
T30S	R31E	13	NESW
T30S	R31E	13	SESW
T30S	R31E	13	SWSE
T30S	R31E	13	NWNW
T30S	R31E	13	NENW
T30S	R31E	13	SENW
T30S	R31E	13	SWNE
T30S	R31E	13	SENE
T30S	R31E	13	NWSE
T30S	R31E	13	NESE
T30S	R31E	13	SESE
T30S	R31E	14	NWNW
T30S	R31E	14	NENW
T30S	R31E	14	SENW
T30S	R31E	14	NESW
T30S	R31E	14	SESW
T30S	R31E	14	NWNE
T30S	R31E	14	SWNE
T30S	R31E	14	NWSE
T30S	R31E	14	SWSE
T30S	R31E	14	NENE
T30S	R31E	14	SENE
T30S	R31E	14	NESE
T30S	R31E	14	SESE
T30S	R31E	15	SWSW
T30S	R31E	15	NENW
T30S	R31E	15	SENW
T30S	R31E	15	NESW
T30S	R31E	15	SESW
T30S	R31E	15	NENE
T30S	R31E	15	NWNE
T30S	R31E	15	SWNE
T30S	R31E	15	NWSE
T30S	R31E	15	SWSE
T31S	R32.5E	7	NWNW
T31S	R32.5E	7	SWNW
T31S	R32.5E	7	NWSW
T31S	R32.5E	7	SWSW
T31S	R32.5E	7	NENW
T31S	R32.5E	7	SENW

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	7	NESW
T31S	R32.5E	7	SESW
T31S	R32.5E	7	NWNE
T31S	R32.5E	7	SWNE
T31S	R32.5E	7	NWSE
T31S	R32.5E	7	SWSE
T31S	R32.5E	7	NENE
T31S	R32.5E	7	SENE
T31S	R32.5E	7	NESE
T31S	R32.5E	7	SESE
T31S	R32.5E	8	NWNW
T31S	R32.5E	8	SWNW
T31S	R32.5E	8	NWSW
T31S	R32.5E	8	SWSW
T31S	R32.5E	8	NENW
T31S	R32.5E	8	NESW
T31S	R32.5E	8	SESW
T31S	R32.5E	8	NWNE
T31S	R32.5E	8	SWNE
T31S	R32.5E	8	NWSE
T31S	R32.5E	8	SWSE
T31S	R32.5E	8	SENW
T31S	R32.5E	8	NENE
T31S	R32.5E	8	SENE
T31S	R32.5E	8	NESE
T31S	R32.5E	8	SESE
T31S	R32.5E	9	NWNW
T31S	R32.5E	9	SWNW
T31S	R32.5E	9	NWSW
T31S	R32.5E	9	SWSW
T31S	R32.5E	9	NENW
T31S	R32.5E	9	SENW
T31S	R32.5E	9	NESW
T31S	R32.5E	9	SESW
T31S	R32.5E	9	NWNE
T31S	R32.5E	9	NENE
T31S	R32.5E	16	NWNW
T31S	R32.5E	16	SWNW
T31S	R32.5E	16	NENW
T31S	R32.5E	16	SENW
T31S	R32.5E	16	NWNE
T31S	R32.5E	16	NESW
T31S	R32.5E	16	NWSW
T31S	R32.5E	16	SWSW
T31S	R32.5E	16	SESW
T31S	R32.5E	17	NWNW
T31S	R32.5E	17	SWNW
T31S	R32.5E	17	NWSW
T31S	R32.5E	17	SWSW
T31S	R32.5E	17	NENW
T31S	R32.5E	17	SENW
T31S	R32.5E	17	NESW
T31S	R32.5E	17	SESW
T31S	R32.5E	17	NWNE
T31S	R32.5E	17	SWNE
T31S	R32.5E	17	NWSE
T31S	R32.5E	17	SWSE
T31S	R32.5E	17	NENE
T31S	R32.5E	17	SENE
T31S	R32.5E	17	NESE
T31S	R32.5E	17	SESE
T31S	R32.5E	6	SWNW
T31S	R32.5E	6	NWSW
T31S	R32.5E	6	SWSW
T31S	R32.5E	6	SENW
T31S	R32.5E	6	NESW
T31S	R32.5E	6	SESW
T31S	R32.5E	6	SWNE

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	6	NWSE
T31S	R32.5E	6	SWSE
T31S	R32.5E	6	NESE
T31S	R32.5E	6	SESE
T31S	R32.5E	6	SENE
T31S	R32.5E	5	SWNW
T31S	R32.5E	5	NWSW
T31S	R32.5E	5	SWSW
T31S	R32.5E	5	SENW
T31S	R32.5E	5	NESW
T31S	R32.5E	5	SESW
T31S	R32.5E	5	NWSE
T31S	R32.5E	5	SWSE
T31S	R32.5E	5	SENE
T31S	R32.5E	5	NESE
T31S	R32.5E	5	SESE
T31S	R32.5E	5	SWNE
T31S	R32.5E	4	NWSW
T31S	R32.5E	4	SWSW
T31S	R32.5E	4	NESW
T31S	R32.5E	4	SESW
T31S	R32.5E	4	NWSE
T31S	R32.5E	4	SWSE
T31S	R32.5E	4	NESE
T31S	R32.5E	4	SESE
T31S	R32.5E	4	SWNW
T31S	R32.5E	4	SENW
T31S	R32.5E	4	SENE
T31S	R32.5E	4	SWNE
T31S	R32.5E	3	SWNW
T31S	R32.5E	3	NWSW
T31S	R32.5E	3	SWSW
T31S	R32.5E	18	NWNW
T31S	R32.5E	18	SWNW
T31S	R32.5E	18	NWSW
T31S	R32.5E	18	SWSW
T31S	R32.5E	18	NENW
T31S	R32.5E	18	SENW
T31S	R32.5E	18	NESW
T31S	R32.5E	18	SESW
T31S	R32.5E	18	NWNE
T31S	R32.5E	18	SWNE
T31S	R32.5E	18	NWSE
T31S	R32.5E	18	SWSE
T31S	R32.5E	18	NENE
T31S	R32.5E	18	SENE
T31S	R32.5E	18	NESE
T31S	R32.5E	18	SESE
T31S	R32.5E	19	NWNW
T31S	R32.5E	19	SWNW
T31S	R32.5E	19	NWSW
T31S	R32.5E	19	SWSW
T31S	R32.5E	19	NENW
T31S	R32.5E	19	SENW
T31S	R32.5E	19	NESW
T31S	R32.5E	19	SESW
T31S	R32.5E	19	NWNE
T31S	R32.5E	19	SWNE
T31S	R32.5E	19	NWSE
T31S	R32.5E	19	SWSE
T31S	R32.5E	19	NENE
T31S	R32.5E	19	SENE
T31S	R32.5E	19	NESE
T31S	R32.5E	19	SESE
T31S	R32.5E	20	NWNW
T31S	R32.5E	20	SWNW
T31S	R32.5E	20	NWSW
T31S	R32.5E	20	SWSW

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	20	NENW
T31S	R32.5E	20	SENW
T31S	R32.5E	20	NESW
T31S	R32.5E	20	SESW
T31S	R32.5E	20	NWNE
T31S	R32.5E	20	SWNE
T31S	R32.5E	20	NWSE
T31S	R32.5E	20	SWSE
T31S	R32.5E	20	NENE
T31S	R32.5E	20	SENE
T31S	R32.5E	20	NESE
T31S	R32.5E	20	SESE
T31S	R32.5E	21	NWNW
T31S	R32.5E	21	SWNW
T31S	R32.5E	21	NWSW
T31S	R32.5E	21	SWSW
T31S	R32.5E	21	NENW
T31S	R32.5E	21	SENW
T31S	R32.5E	21	NESW
T31S	R32.5E	21	SESW
T31S	R32.5E	21	NWNE
T31S	R32.5E	21	SWNE
T31S	R32.5E	21	SESE
T31S	R32.5E	21	NWSE
T31S	R32.5E	21	SWSE
T31S	R32.5E	28	NWNW
T31S	R32.5E	28	SWNW
T31S	R32.5E	28	NWSW
T31S	R32.5E	28	SWSW
T31S	R32.5E	28	NENW
T31S	R32.5E	28	SENW
T31S	R32.5E	28	NESW
T31S	R32.5E	28	SESW
T31S	R32.5E	28	NWNE
T31S	R32.5E	28	SWNE
T31S	R32.5E	28	NWSE
T31S	R32.5E	28	SWSE
T31S	R32.5E	29	NWNW
T31S	R32.5E	29	SWNW
T31S	R32.5E	29	NWSW
T31S	R32.5E	29	SWSW
T31S	R32.5E	29	NENW
T31S	R32.5E	29	SENW
T31S	R32.5E	29	NESW
T31S	R32.5E	29	SESW
T31S	R32.5E	29	NWNE
T31S	R32.5E	29	SWNE
T31S	R32.5E	29	NWSE
T31S	R32.5E	29	SWSE
T31S	R32.5E	29	NENE
T31S	R32.5E	29	SENE
T31S	R32.5E	29	NESE
T31S	R32.5E	29	SESE
T31S	R32.5E	30	NWNW
T31S	R32.5E	30	SWNW
T31S	R32.5E	30	NWSW
T31S	R32.5E	30	SWSW
T31S	R32.5E	30	NENW
T31S	R32.5E	30	SENW
T31S	R32.5E	30	NESW
T31S	R32.5E	30	SESW
T31S	R32.5E	30	NWNE
T31S	R32.5E	30	SWNE
T31S	R32.5E	30	NWSE
T31S	R32.5E	30	SWSE
T31S	R32.5E	30	NENE
T31S	R32.5E	30	SENE
T31S	R32.5E	30	NESE

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	30	SESE
T31S	R32.5E	31	NWNW
T31S	R32.5E	31	SWNW
T31S	R32.5E	31	NWSW
T31S	R32.5E	31	SWSW
T31S	R32.5E	31	NENW
T31S	R32.5E	31	SENW
T31S	R32.5E	31	NESW
T31S	R32.5E	31	SESW
T31S	R32.5E	31	NWNE
T31S	R32.5E	31	SWNE
T31S	R32.5E	31	NWSE
T31S	R32.5E	31	SWSE
T31S	R32.5E	31	NENE
T31S	R32.5E	31	SENE
T31S	R32.5E	31	NESE
T31S	R32.5E	31	SESE
T31S	R32.5E	32	NWNW
T31S	R32.5E	32	SWNW
T31S	R32.5E	32	NWSW
T31S	R32.5E	32	SWSW
T31S	R32.5E	32	NENW
T31S	R32.5E	32	SENW
T31S	R32.5E	32	NESW
T31S	R32.5E	32	SESW
T31S	R32.5E	32	NWNE
T31S	R32.5E	32	SWNE
T31S	R32.5E	32	NWSE
T31S	R32.5E	32	SWSE
T31S	R32.5E	32	NENE
T31S	R32.5E	32	SENE
T31S	R32.5E	32	NESE
T31S	R32.5E	32	SESE
T31S	R32.5E	33	NWNW
T31S	R32.5E	33	SWNW
T31S	R32.5E	33	NWSW
T31S	R32.5E	33	SWSW
T31S	R32.5E	33	NENW
T31S	R32.5E	33	SENW
T31S	R32.5E	33	NESW
T31S	R32.5E	33	SESW
T31S	R32.5E	33	NWNE
T31S	R32.5E	33	SWNE
T31S	R32.5E	33	NWSE
T31S	R32.5E	33	SWSE
T31S	R32E	1	NESE
T31S	R32E	1	SESE
T31S	R32E	12	SWSE
T31S	R32E	12	NENE
T31S	R32E	12	SENE
T31S	R32E	12	NESE
T31S	R32E	12	SESE
T31S	R32E	13	NESW
T31S	R32E	13	SESW
T31S	R32E	13	NWNE
T31S	R32E	13	SWNE
T31S	R32E	13	NWSE
T31S	R32E	13	SWSE
T31S	R32E	13	NENE
T31S	R32E	13	SENE
T31S	R32E	13	NESE
T31S	R32E	13	SESE
T31S	R32E	23	SESE
T31S	R32E	24	NWSW
T31S	R32E	24	SWSW
T31S	R32E	24	NENW
T31S	R32E	24	SENW

Township	Range	Section	Qtr/Qtr
T31S	R32E	24	NESW
T31S	R32E	24	SESW
T31S	R32E	24	NWNE
T31S	R32E	24	SWNE
T31S	R32E	24	NWSE
T31S	R32E	24	SWSE
T31S	R32E	24	NENE
T31S	R32E	24	SENE
T31S	R32E	24	NESE
T31S	R32E	24	SESE
T31S	R32E	25	NWNW
T31S	R32E	25	SWNW
T31S	R32E	25	NWSW
T31S	R32E	25	SWSW
T31S	R32E	25	NENW
T31S	R32E	25	SENW
T31S	R32E	25	NESW
T31S	R32E	25	SESW
T31S	R32E	25	NWNE
T31S	R32E	25	SWNE
T31S	R32E	25	NWSE
T31S	R32E	25	SWSE
T31S	R32E	25	NENE
T31S	R32E	25	SENE
T31S	R32E	25	NESE
T31S	R32E	25	SESE
T31S	R32E	26	NENE
T31S	R32E	26	SENE
T31S	R32E	26	NESE
T31S	R32E	26	SESE
T31S	R32E	35	NESW
T31S	R32E	35	SESW
T31S	R32E	35	SWNE
T31S	R32E	35	NWSE
T31S	R32E	35	SWSE
T31S	R32E	35	NENE
T31S	R32E	35	SENE
T31S	R32E	35	NESE
T31S	R32E	35	SESE
T31S	R32E	36	NWNW
T31S	R32E	36	SWNW
T31S	R32E	36	NWSW
T31S	R32E	36	SWSW
T31S	R32E	36	NENW
T31S	R32E	36	SENW
T31S	R32E	36	NESW
T31S	R32E	36	SESW
T31S	R32E	36	NWNE
T31S	R32E	36	SWNE
T31S	R32E	36	NWSE
T31S	R32E	36	SWSE
T31S	R32E	36	NENE
T31S	R32E	36	SENE
T31S	R32E	36	NESE
T31S	R32E	36	SESE
T32S	R32.5E	8	SWSW
T32S	R32.5E	8	NWSW
T32S	R32.5E	8	SWNW
T32S	R32.5E	8	NWNW
T32S	R32.5E	8	NENW
T32S	R32.5E	8	NWNE
T32S	R32.5E	7	NWSW
T32S	R32.5E	7	SWNW
T32S	R32.5E	7	NWNW
T32S	R32.5E	7	NESW
T32S	R32.5E	7	SENW
T32S	R32.5E	7	NENW

Township	Range	Section	Qtr/Qtr
T32S	R32.5E	7	NWNE
T32S	R32.5E	7	SWNE
T32S	R32.5E	7	NWSE
T32S	R32.5E	7	NESE
T32S	R32.5E	7	SENE
T32S	R32.5E	7	NENE
T32S	R32.5E	6	SWSW
T32S	R32.5E	6	NWSW
T32S	R32.5E	6	SWNW
T32S	R32.5E	6	NWNW
T32S	R32.5E	6	SESW
T32S	R32.5E	6	NESW
T32S	R32.5E	6	SENW
T32S	R32.5E	6	NENW
T32S	R32.5E	6	NWNE
T32S	R32.5E	6	SWNE
T32S	R32.5E	6	NWSE
T32S	R32.5E	6	SWSE
T32S	R32.5E	6	NENE
T32S	R32.5E	6	SENE
T32S	R32.5E	6	NESE
T32S	R32.5E	6	SESE
T32S	R32.5E	5	SWSW
T32S	R32.5E	5	NWSW
T32S	R32.5E	5	SWNW
T32S	R32.5E	5	NWNW
T32S	R32.5E	5	NENW
T32S	R32.5E	5	SENW
T32S	R32.5E	5	NESW
T32S	R32.5E	5	SESW
T32S	R32.5E	5	SWSE
T32S	R32.5E	5	NWSE
T32S	R32.5E	5	SWNE
T32S	R32.5E	5	NWNE
T32S	R32.5E	5	NENE
T32S	R32.5E	5	SENE
T32S	R32.5E	5	NESE
T32S	R32.5E	4	NWNW
T32S	R32.5E	4	SWNW
T32S	R32.5E	4	SENW
T32S	R32.5E	4	NENW
T32S	R32.5E	4	NWSW
T32S	R32.5E	4	NESW
T32S	R32.5E	4	NWNE
T32S	R32.5E	4	SWNE
T32S	R32.5E	4	NWSE
T32S	R32E	1	NWNW
T32S	R32E	1	SWNW
T32S	R32E	1	NWSW
T32S	R32E	1	SWSW
T32S	R32E	1	NENW
T32S	R32E	1	SENW
T32S	R32E	1	NESW
T32S	R32E	1	SESW
T32S	R32E	1	NWNE
T32S	R32E	1	SWNE
T32S	R32E	1	NWSE
T32S	R32E	1	SWSE
T32S	R32E	1	NENE
T32S	R32E	1	SENE
T32S	R32E	1	NESE
T32S	R32E	1	SESE
T32S	R32E	2	NWNE
T32S	R32E	2	SWNE
T32S	R32E	2	NENE
T32S	R32E	2	SENE
T32S	R32E	2	NESE

Township	Range	Section	Qtr/Qtr
T32S	R32E	2	SESE
T32S	R32E	11	NWNE
T32S	R32E	11	NENE
T32S	R32E	11	SENE
T32S	R32E	12	NWNW
T32S	R32E	12	SWNW
T32S	R32E	12	SENW
T32S	R32E	12	NENW
T32S	R32E	12	NWSE
T32S	R32E	12	NWNE
T32S	R32E	12	SWNE
T32S	R32E	12	NENE
T32S	R32E	12	SENE
T32S	R32E	12	NESE

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Attachment C

Proposed Location of the Place of Use.

Township	Range	Section	Qtr/Qtr
T26S	R31E	34	NWSW
T26S	R31E	34	SWSW
T27S	R30E	25	NWSE
T27S	R30E	25	SWSE
T27S	R30E	25	SENE
T27S	R30E	25	NESE
T27S	R30E	25	SESE
T27S	R30E	36	NWNE
T27S	R30E	36	SWNE
T27S	R30E	36	NENE
T27S	R30E	36	SENE
T27S	R31E	2	NWNW
T27S	R31E	2	SWNW
T27S	R31E	2	NWSW
T27S	R31E	2	SWSW
T27S	R31E	2	NENW
T27S	R31E	3	NWNW
T27S	R31E	3	SWNW
T27S	R31E	3	NWSW
T27S	R31E	3	SWSW
T27S	R31E	3	NENW
T27S	R31E	3	SENW
T27S	R31E	3	NESW
T27S	R31E	3	SESW
T27S	R31E	3	NWNE
T27S	R31E	3	SWNE
T27S	R31E	3	NWSE
T27S	R31E	3	SWSE
T27S	R31E	3	NENE
T27S	R31E	3	SENE
T27S	R31E	3	NESE
T27S	R31E	3	SESE
T27S	R31E	10	NWNW
T27S	R31E	10	SWNW
T27S	R31E	10	NWSW
T27S	R31E	10	SWSW
T27S	R31E	10	NENW
T27S	R31E	10	SENW
T27S	R31E	10	NESW
T27S	R31E	10	SESW
T27S	R31E	10	NWNE
T27S	R31E	10	SWNE
T27S	R31E	10	NWSE
T27S	R31E	10	SWSE
T27S	R31E	10	NENE
T27S	R31E	10	SENE
T27S	R31E	10	NESE
T27S	R31E	10	SESE
T27S	R31E	11	NWNW
T27S	R31E	11	SWNW
T27S	R31E	11	NWSW
T27S	R31E	11	SWSW
T27S	R31E	14	NWNW
T27S	R31E	14	SWNW
T27S	R31E	14	NWSW
T27S	R31E	14	SWSW
T27S	R31E	15	NWNW
T27S	R31E	15	SWNW
T27S	R31E	15	NENW
T27S	R31E	15	SENW
T27S	R31E	15	NWNE
T27S	R31E	15	SWNE

Township	Range	Section	Qtr/Qtr
T27S	R31E	15	NENE
T27S	R31E	15	SENE
T27S	R31E	15	NWSW
T27S	R31E	15	SWSW
T27S	R31E	15	NESW
T27S	R31E	15	SESW
T27S	R31E	15	NWSE
T27S	R31E	15	SWSE
T27S	R31E	15	NESE
T27S	R31E	15	SESE
T27S	R31E	4	NWNW
T27S	R31E	4	SWNW
T27S	R31E	4	NWSW
T27S	R31E	4	SWSW
T27S	R31E	4	NENW
T27S	R31E	4	SENW
T27S	R31E	4	NESW
T27S	R31E	4	SESW
T27S	R31E	4	NWNE
T27S	R31E	4	SWNE
T27S	R31E	4	NWSE
T27S	R31E	4	SWSE
T27S	R31E	4	NENE
T27S	R31E	4	SENE
T27S	R31E	4	NESE
T27S	R31E	4	SESE
T27S	R31E	8	SWSE
T27S	R31E	8	SESE
T27S	R31E	9	NWNW
T27S	R31E	9	SWNW
T27S	R31E	9	NWSW
T27S	R31E	9	SWSW
T27S	R31E	9	NENW
T27S	R31E	9	SENW
T27S	R31E	9	NESW
T27S	R31E	9	SESW
T27S	R31E	9	NWNE
T27S	R31E	9	SWNE
T27S	R31E	9	NWSE
T27S	R31E	9	SWSE
T27S	R31E	9	NENE
T27S	R31E	9	SENE
T27S	R31E	9	NESE
T27S	R31E	9	SESE
T27S	R31E	16	NWNW
T27S	R31E	16	SWNW
T27S	R31E	16	NWSW
T27S	R31E	16	SWSW
T27S	R31E	16	NENW
T27S	R31E	16	SENW
T27S	R31E	16	NESW
T27S	R31E	16	SESW
T27S	R31E	16	NWNE
T27S	R31E	16	SWNE
T27S	R31E	16	NWSE
T27S	R31E	16	SWSE
T27S	R31E	16	NENE
T27S	R31E	16	SENE
T27S	R31E	16	NESE
T27S	R31E	16	SESE
T27S	R31E	17	SWSW
T27S	R31E	17	NWNW
T27S	R31E	17	SWNW
T27S	R31E	17	NWSW
T27S	R31E	17	NENW
T27S	R31E	17	SENW
T27S	R31E	17	NWNE
T27S	R31E	17	SWNE

Township	Range	Section	Qtr/Qtr
T27S	R31E	17	NESW
T27S	R31E	17	SESW
T27S	R31E	17	NWSE
T27S	R31E	17	SWSE
T27S	R31E	17	NENE
T27S	R31E	17	SENE
T27S	R31E	17	NESE
T27S	R31E	17	SESE
T27S	R31E	18	SESW
T27S	R31E	18	NWSE
T27S	R31E	18	SWSE
T27S	R31E	18	NESE
T27S	R31E	18	SESE
T27S	R31E	19	NWNW
T27S	R31E	19	SWNW
T27S	R31E	19	NWSW
T27S	R31E	19	SWSW
T27S	R31E	19	NENW
T27S	R31E	19	SENW
T27S	R31E	19	NESW
T27S	R31E	19	SESW
T27S	R31E	19	NWNE
T27S	R31E	19	SWNE
T27S	R31E	19	NWSE
T27S	R31E	19	SWSE
T27S	R31E	19	NENE
T27S	R31E	19	SENE
T27S	R31E	19	NESE
T27S	R31E	19	SESE
T27S	R31E	20	NWNW
T27S	R31E	20	SWNW
T27S	R31E	20	NWSW
T27S	R31E	20	SWSW
T27S	R31E	20	NENW
T27S	R31E	20	SENW
T27S	R31E	20	NESW
T27S	R31E	20	SESW
T27S	R31E	20	NWNE
T27S	R31E	20	SWNE
T27S	R31E	20	NWSE
T27S	R31E	20	SWSE
T27S	R31E	20	NENE
T27S	R31E	20	SENE
T27S	R31E	20	NESE
T27S	R31E	20	SESE
T27S	R31E	21	NWNW
T27S	R31E	21	SWNW
T27S	R31E	21	NWSW
T27S	R31E	21	SWSW
T27S	R31E	21	NENW
T27S	R31E	21	SENW
T27S	R31E	21	NESW
T27S	R31E	21	SESW
T27S	R31E	21	NWNE
T27S	R31E	21	SWNE
T27S	R31E	21	NWSE
T27S	R31E	21	SWSE
T27S	R31E	21	NENE
T27S	R31E	21	SENE
T27S	R31E	21	NESE
T27S	R31E	21	SESE
T27S	R31E	28	NWNW
T27S	R31E	28	SWNW
T27S	R31E	28	NWSW
T27S	R31E	28	SWSW
T27S	R31E	28	NENW
T27S	R31E	28	SENW
T27S	R31E	28	NESW

Township	Range	Section	Qtr/Qtr
T27S	R31E	28	SESW
T27S	R31E	28	NWNE
T27S	R31E	28	SWNE
T27S	R31E	28	NWSE
T27S	R31E	28	SWSE
T27S	R31E	28	NENE
T27S	R31E	28	SENE
T27S	R31E	28	NESE
T27S	R31E	28	SESE
T27S	R31E	29	NWNW
T27S	R31E	29	SWNW
T27S	R31E	29	NWSW
T27S	R31E	29	SWSW
T27S	R31E	29	NENW
T27S	R31E	29	SENW
T27S	R31E	29	NESW
T27S	R31E	29	SESW
T27S	R31E	29	NWNE
T27S	R31E	29	SWNE
T27S	R31E	29	NWSE
T27S	R31E	29	SWSE
T27S	R31E	29	NENE
T27S	R31E	29	SENE
T27S	R31E	29	NESE
T27S	R31E	29	SESE
T27S	R31E	30	NWNW
T27S	R31E	30	SWNW
T27S	R31E	30	NWSW
T27S	R31E	30	SWSW
T27S	R31E	30	NENW
T27S	R31E	30	SENW
T27S	R31E	30	NESW
T27S	R31E	30	SESW
T27S	R31E	30	NWNE
T27S	R31E	30	SWNE
T27S	R31E	30	NWSE
T27S	R31E	30	SWSE
T27S	R31E	30	NENE
T27S	R31E	30	SENE
T27S	R31E	30	NESE
T27S	R31E	30	SESE
T27S	R31E	31	NWNW
T27S	R31E	31	SWNW
T27S	R31E	31	NWSW
T27S	R31E	31	SWSW
T27S	R31E	31	NENW
T27S	R31E	31	SENW
T27S	R31E	31	NESW
T27S	R31E	31	SESW
T27S	R31E	31	NWNE
T27S	R31E	31	SWNE
T27S	R31E	31	NWSE
T27S	R31E	31	SWSE
T27S	R31E	31	NENE
T27S	R31E	31	SENE
T27S	R31E	31	NESE
T27S	R31E	31	SESE
T27S	R31E	32	NWNW
T27S	R31E	32	SWNW
T27S	R31E	32	NWSW
T27S	R31E	32	SWSW
T27S	R31E	32	NENW
T27S	R31E	32	SENW
T27S	R31E	32	NESW
T27S	R31E	32	SESW
T27S	R31E	32	NWNE
T27S	R31E	32	SWNE
T27S	R31E	32	NWSE

Township	Range	Section	Qtr/Qtr
T27S	R31E	32	SWSE
T27S	R31E	32	NENE
T27S	R31E	32	SENE
T27S	R31E	32	NESE
T27S	R31E	32	SESE
T27S	R31E	33	NWNW
T27S	R31E	33	SWNW
T27S	R31E	33	NWSW
T27S	R31E	33	SWSW
T27S	R31E	33	NENW
T27S	R31E	33	SENW
T27S	R31E	33	NESW
T27S	R31E	33	SESW
T27S	R31E	33	NWNE
T27S	R31E	33	SWNE
T27S	R31E	33	NWSE
T27S	R31E	33	SWSE
T27S	R31E	33	NENE
T27S	R31E	33	SENE
T27S	R31E	33	NESE
T27S	R31E	33	SESE
T27S	R31E	22	NWNW
T27S	R31E	22	SWNW
T27S	R31E	22	NWSW
T27S	R31E	22	SWSW
T27S	R31E	22	NENW
T27S	R31E	22	SENW
T27S	R31E	22	NESW
T27S	R31E	22	SESW
T27S	R31E	22	NWNE
T27S	R31E	22	SWNE
T27S	R31E	22	NWSE
T27S	R31E	22	SWSE
T27S	R31E	22	NENE
T27S	R31E	22	SENE
T27S	R31E	22	NESE
T27S	R31E	22	SESE
T27S	R31E	23	NWNW
T27S	R31E	23	SWNW
T27S	R31E	23	NWSW
T27S	R31E	23	SWSW
T27S	R31E	23	SESW
T27S	R31E	23	SENW
T27S	R31E	23	NESW
T27S	R31E	26	NWNW
T27S	R31E	26	SWNW
T27S	R31E	26	NWSW
T27S	R31E	26	SWSW
T27S	R31E	26	NENW
T27S	R31E	26	SENW
T27S	R31E	26	NESW
T27S	R31E	26	SESW
T27S	R31E	27	NWNW
T27S	R31E	27	SWNW
T27S	R31E	27	NWSW
T27S	R31E	27	SWSW
T27S	R31E	27	NENW
T27S	R31E	27	SENW
T27S	R31E	27	NESW
T27S	R31E	27	SESW
T27S	R31E	27	NWNE
T27S	R31E	27	SWNE
T27S	R31E	27	NWSE
T27S	R31E	27	SWSE
T27S	R31E	27	NENE
T27S	R31E	27	SENE
T27S	R31E	27	NESE
T27S	R31E	27	SESE

Township	Range	Section	Qtr/Qtr
T27S	R31E	34	NWNW
T27S	R31E	34	SWNW
T27S	R31E	34	NWSW
T27S	R31E	34	SWSW
T27S	R31E	34	NENW
T27S	R31E	34	SENW
T27S	R31E	34	NESW
T27S	R31E	34	SESW
T27S	R31E	34	NWNE
T27S	R31E	34	SWNE
T27S	R31E	34	NWSE
T27S	R31E	34	SWSE
T27S	R31E	34	NENE
T27S	R31E	34	SENE
T27S	R31E	34	NESE
T27S	R31E	34	SESE
T27S	R31E	35	NWNW
T27S	R31E	35	SWNW
T27S	R31E	35	NWSW
T27S	R31E	35	SWSW
T27S	R31E	35	NENW
T27S	R31E	35	SENW
T28S	R31E	4	NWNW
T28S	R31E	4	SWNW
T28S	R31E	4	NWSW
T28S	R31E	4	SWSW
T28S	R31E	4	NENW
T28S	R31E	4	SENW
T28S	R31E	4	NESW
T28S	R31E	4	SESW
T28S	R31E	4	NWNE
T28S	R31E	4	SWNE
T28S	R31E	4	NWSE
T28S	R31E	4	SWSE
T28S	R31E	4	NENE
T28S	R31E	4	SENE
T28S	R31E	4	NESE
T28S	R31E	4	SESE
T28S	R31E	5	NWNW
T28S	R31E	5	SWNW
T28S	R31E	5	NWSW
T28S	R31E	5	SWSW
T28S	R31E	5	NENW
T28S	R31E	5	SENW
T28S	R31E	5	NESW
T28S	R31E	5	SESW
T28S	R31E	5	NWNE
T28S	R31E	5	SWNE
T28S	R31E	5	NWSE
T28S	R31E	5	SWSE
T28S	R31E	5	NENE
T28S	R31E	5	SENE
T28S	R31E	5	NESE
T28S	R31E	5	SESE
T28S	R31E	6	NWNW
T28S	R31E	6	SWNW
T28S	R31E	6	NENW
T28S	R31E	6	SENW
T28S	R31E	6	NWNE
T28S	R31E	6	SWNE
T28S	R31E	6	NENE
T28S	R31E	6	SENE
T28S	R31E	6	NESE
T28S	R31E	6	SESE
T28S	R31E	7	NENE
T28S	R31E	7	SENE
T28S	R31E	7	NESE

Township	Range	Section	Qtr/Qtr
T28S	R31E	7	SESE
T28S	R31E	8	NWNW
T28S	R31E	8	SWNW
T28S	R31E	8	NWSW
T28S	R31E	8	SWSW
T28S	R31E	8	NENW
T28S	R31E	8	SENW
T28S	R31E	8	NESW
T28S	R31E	8	SESW
T28S	R31E	8	NWNE
T28S	R31E	8	SWNE
T28S	R31E	8	NWSE
T28S	R31E	8	SWSE
T28S	R31E	8	NENE
T28S	R31E	8	SENE
T28S	R31E	8	NESE
T28S	R31E	8	SESE
T28S	R31E	9	NWNW
T28S	R31E	9	SWNW
T28S	R31E	9	NWSW
T28S	R31E	9	SWSW
T28S	R31E	9	NENW
T28S	R31E	9	SENW
T28S	R31E	9	NESW
T28S	R31E	9	SESW
T28S	R31E	9	NWNE
T28S	R31E	9	SWNE
T28S	R31E	9	NWSE
T28S	R31E	9	SWSE
T28S	R31E	9	NENE
T28S	R31E	9	SENE
T28S	R31E	9	NESE
T28S	R31E	9	SESE
T28S	R31E	16	NWNW
T28S	R31E	16	SWNW
T28S	R31E	16	NWSW
T28S	R31E	16	SWSW
T28S	R31E	16	NENW
T28S	R31E	16	SENW
T28S	R31E	16	NESW
T28S	R31E	16	SESW
T28S	R31E	16	NWSE
T28S	R31E	16	SWSE
T28S	R31E	16	NWNE
T28S	R31E	16	SWNE
T28S	R31E	16	SENE
T28S	R31E	16	NESE
T28S	R31E	16	NENE
T28S	R31E	16	SESE
T28S	R31E	17	NWNW
T28S	R31E	17	SWNW
T28S	R31E	17	NWSW
T28S	R31E	17	SWSW
T28S	R31E	17	NENW
T28S	R31E	17	SENW
T28S	R31E	17	NESW
T28S	R31E	17	SESW
T28S	R31E	17	NWNE
T28S	R31E	17	SWNE
T28S	R31E	17	NWSE
T28S	R31E	17	SWSE
T28S	R31E	17	NENE
T28S	R31E	17	SENE
T28S	R31E	17	NESE
T28S	R31E	17	SESE
T28S	R31E	18	SESE
T28S	R31E	18	NENE
T28S	R31E	18	SENE

Township	Range	Section	Qtr/Qtr
T28S	R31E	18	NESE
T28S	R31E	3	NWNW
T28S	R31E	3	SWNW
T28S	R31E	3	NWSW
T28S	R31E	3	SWSW
T28S	R31E	3	NENW
T28S	R31E	3	SENW
T28S	R31E	3	NESW
T28S	R31E	3	SESW
T28S	R31E	3	NWNE
T28S	R31E	3	SWNE
T28S	R31E	3	NWSE
T28S	R31E	3	SWSE
T28S	R31E	3	NENE
T28S	R31E	3	SENE
T28S	R31E	10	NWNW
T28S	R31E	10	SWNW
T28S	R31E	10	NWSW
T28S	R31E	10	SWSW
T28S	R31E	10	NENW
T28S	R31E	10	SENW
T28S	R31E	10	NESW
T28S	R31E	10	SESW
T28S	R31E	10	NWNE
T28S	R31E	15	NWNW
T28S	R31E	15	SWNW
T28S	R31E	15	NWSW
T28S	R31E	15	SWSW
T28S	R31E	15	NENW
T28S	R31E	15	SENW
T28S	R31E	15	NESW
T28S	R31E	15	SESW
T28S	R31E	22	NWNW
T28S	R31E	22	SWNW
T28S	R31E	22	NWSW
T28S	R31E	22	SWSW
T28S	R31E	22	NENW
T28S	R31E	22	SENW
T28S	R31E	22	NESW
T28S	R31E	22	SESW
T28S	R31E	22	NWNE
T28S	R31E	22	SWNE
T28S	R31E	22	NWSE
T28S	R31E	22	SWSE
T28S	R31E	22	NENE
T28S	R31E	22	SENE
T28S	R31E	22	NESE
T28S	R31E	22	SESE
T28S	R31E	23	SWNW
T28S	R31E	23	NWSW
T28S	R31E	23	SWSW
T28S	R31E	23	NESW
T28S	R31E	23	SESW
T28S	R31E	25	NWNW
T28S	R31E	25	SWNW
T28S	R31E	25	NWSW
T28S	R31E	25	SWSW
T28S	R31E	25	SENW
T28S	R31E	25	NESW
T28S	R31E	25	SESW
T28S	R31E	25	SWNE
T28S	R31E	25	NWSE
T28S	R31E	25	SWSE
T28S	R31E	25	SESE
T28S	R31E	26	NWNW
T28S	R31E	26	SWNW
T28S	R31E	26	NWSW
T28S	R31E	26	SWSW

Township	Range	Section	Qtr/Qtr
T28S	R31E	26	NENW
T28S	R31E	26	SENW
T28S	R31E	26	NESW
T28S	R31E	26	SESW
T28S	R31E	26	NWNE
T28S	R31E	26	SWNE
T28S	R31E	26	NWSE
T28S	R31E	26	SWSE
T28S	R31E	26	NENE
T28S	R31E	26	SENE
T28S	R31E	26	NESE
T28S	R31E	26	SESE
T28S	R31E	27	NWNW
T28S	R31E	27	SWNW
T28S	R31E	27	NWSW
T28S	R31E	27	SWSW
T28S	R31E	27	NENW
T28S	R31E	27	SENW
T28S	R31E	27	NESW
T28S	R31E	27	SESW
T28S	R31E	27	NWNE
T28S	R31E	27	SWNE
T28S	R31E	27	NWSE
T28S	R31E	27	SWSE
T28S	R31E	27	NENE
T28S	R31E	27	SENE
T28S	R31E	27	NESE
T28S	R31E	27	SESE
T28S	R31E	34	NWNW
T28S	R31E	34	SWNW
T28S	R31E	34	NWSW
T28S	R31E	34	SWSW
T28S	R31E	34	NENW
T28S	R31E	34	SENW
T28S	R31E	34	NESW
T28S	R31E	34	SESW
T28S	R31E	34	NWNE
T28S	R31E	34	SWNE
T28S	R31E	34	NWSE
T28S	R31E	34	SWSE
T28S	R31E	34	NENE
T28S	R31E	34	SENE
T28S	R31E	34	NESE
T28S	R31E	34	SESE
T28S	R31E	35	NWNW
T28S	R31E	35	SWNW
T28S	R31E	35	NWSW
T28S	R31E	35	SWSW
T28S	R31E	35	NENW
T28S	R31E	35	SENW
T28S	R31E	35	NESW
T28S	R31E	35	SESW
T28S	R31E	35	NWNE
T28S	R31E	35	SWNE
T28S	R31E	35	NWSE
T28S	R31E	35	SWSE
T28S	R31E	35	NENE
T28S	R31E	35	SENE
T28S	R31E	35	NESE
T28S	R31E	35	SESE
T28S	R31E	36	NWNW
T28S	R31E	36	SWNW
T28S	R31E	36	NWSW
T28S	R31E	36	SWSW
T28S	R31E	36	NENW
T28S	R31E	36	SENW
T28S	R31E	36	NESW
T28S	R31E	36	SESW

Township	Range	Section	Qtr/Qtr
T28S	R31E	36	NWNE
T28S	R31E	36	SWNE
T28S	R31E	36	NWSE
T28S	R31E	36	SWSE
T28S	R31E	36	NENE
T28S	R31E	19	NENE
T28S	R31E	19	SENE
T28S	R31E	19	NESE
T28S	R31E	19	SESE
T28S	R31E	20	NWNW
T28S	R31E	20	SWNW
T28S	R31E	20	NWSW
T28S	R31E	20	SWSW
T28S	R31E	20	NENW
T28S	R31E	20	SENW
T28S	R31E	20	NESW
T28S	R31E	20	SESW
T28S	R31E	20	NWNE
T28S	R31E	20	SWNE
T28S	R31E	20	NWSE
T28S	R31E	20	SWSE
T28S	R31E	20	NENE
T28S	R31E	20	SENE
T28S	R31E	20	NESE
T28S	R31E	20	SESE
T28S	R31E	21	NWNW
T28S	R31E	21	SWNW
T28S	R31E	21	NWSW
T28S	R31E	21	SWSW
T28S	R31E	21	NENW
T28S	R31E	21	SENW
T28S	R31E	21	NESW
T28S	R31E	21	SESW
T28S	R31E	21	NWNE
T28S	R31E	21	SWNE
T28S	R31E	21	NWSE
T28S	R31E	21	SWSE
T28S	R31E	21	NENE
T28S	R31E	21	SENE
T28S	R31E	21	NESE
T28S	R31E	21	SESE
T28S	R31E	28	NWNW
T28S	R31E	28	SWNW
T28S	R31E	28	NWSW
T28S	R31E	28	SWSW
T28S	R31E	28	NENW
T28S	R31E	28	SENW
T28S	R31E	28	NESW
T28S	R31E	28	SESW
T28S	R31E	28	NWNE
T28S	R31E	28	SWNE
T28S	R31E	28	NWSE
T28S	R31E	28	SWSE
T28S	R31E	28	NENE
T28S	R31E	28	SENE
T28S	R31E	28	NESE
T28S	R31E	28	SESE
T28S	R31E	29	NWNW
T28S	R31E	29	NENW
T28S	R31E	29	SENW
T28S	R31E	29	NESW
T28S	R31E	29	SWSE
T28S	R31E	29	NWNE
T28S	R31E	29	SWNE
T28S	R31E	29	NWSE
T28S	R31E	29	NENE
T28S	R31E	29	SENE
T28S	R31E	29	NESE

Township	Range	Section	Qtr/Qtr
T28S	R31E	29	SESE
T28S	R31E	32	NENE
T28S	R31E	32	SENE
T28S	R31E	33	NWNW
T28S	R31E	33	SWNW
T28S	R31E	33	NENW
T28S	R31E	33	SENW
T28S	R31E	33	NESW
T28S	R31E	33	NWNE
T28S	R31E	33	SWNE
T28S	R31E	33	NWSE
T28S	R31E	33	SWSE
T28S	R31E	33	NENE
T28S	R31E	33	SENE
T28S	R31E	33	NESE
T28S	R31E	33	SESE
T29S	R32E	15	SWNW
T29S	R32E	15	SWNW
T29S	R32E	19	NWNW
T29S	R32E	19	SWNW
T29S	R32E	19	NWSW
T29S	R32E	19	NENW
T29S	R32E	19	SENW
T29S	R32E	19	NESW
T29S	R32E	19	SESW
T29S	R32E	19	NWNE
T29S	R32E	19	SWNE
T29S	R32E	19	NWSE
T29S	R32E	19	SWSE
T29S	R32E	19	NENE
T29S	R32E	19	SENE
T29S	R32E	19	NESE
T29S	R32E	19	SESE
T29S	R32E	20	NWNW
T29S	R32E	20	SWNW
T29S	R32E	20	NWSW
T29S	R32E	20	SWSW
T29S	R32E	20	NENW
T29S	R32E	20	SENW
T29S	R32E	20	NESW
T29S	R32E	20	SESW
T29S	R32E	20	NWNE
T29S	R32E	20	SWNE
T29S	R32E	20	NWSE
T29S	R32E	20	SWSE
T29S	R32E	20	NENE
T29S	R32E	20	SENE
T29S	R32E	20	NESE
T29S	R32E	20	SESE
T29S	R32E	21	NWNW
T29S	R32E	21	SWNW
T29S	R32E	21	NWSW
T29S	R32E	21	NENW
T29S	R32E	21	SENW
T29S	R32E	21	NESW
T29S	R32E	21	SWSW
T29S	R32E	21	SESW
T29S	R32E	21	NWSE
T29S	R32E	21	SWSE
T29S	R32E	21	SESE
T29S	R32E	29	NWNW
T29S	R32E	29	NENW
T29S	R32E	29	NWNE
T29S	R32E	30	NENE
T29S	R32E	7	SWNW
T29S	R32E	7	NWSW
T29S	R32E	7	SWSW

Township	Range	Section	Qtr/Qtr
T29S	R32E	7	SENW
T29S	R32E	7	NESW
T29S	R32E	7	SESW
T29S	R32E	7	SWNE
T29S	R32E	7	NWSE
T29S	R32E	7	SWSE
T29S	R32E	7	SENE
T29S	R32E	7	NESE
T29S	R32E	7	SESE
T29S	R32E	8	NWSW
T29S	R32E	8	SWSW
T29S	R32E	8	SESW
T29S	R32E	8	SWSE
T29S	R32E	16	SWSW
T29S	R32E	16	NENW
T29S	R32E	16	NWNE
T29S	R32E	16	SWNE
T29S	R32E	16	NENE
T29S	R32E	16	SENE
T29S	R32E	17	NWNW
T29S	R32E	17	SWNW
T29S	R32E	17	NWSW
T29S	R32E	17	SWSW
T29S	R32E	17	NENW
T29S	R32E	17	SENW
T29S	R32E	17	NESW
T29S	R32E	17	SESW
T29S	R32E	17	NWNE
T29S	R32E	17	SWNE
T29S	R32E	17	NWSE
T29S	R32E	17	SWSE
T29S	R32E	17	NENE
T29S	R32E	17	SENE
T29S	R32E	17	NESE
T29S	R32E	17	SESE
T29S	R32E	18	NWNW
T29S	R32E	18	SWNW
T29S	R32E	18	NWSW
T29S	R32E	18	SWSW
T29S	R32E	18	NENW
T29S	R32E	18	SENW
T29S	R32E	18	NESW
T29S	R32E	18	SESW
T29S	R32E	18	NWNE
T29S	R32E	18	SWNE
T29S	R32E	18	NWSE
T29S	R32E	18	SWSE
T29S	R32E	18	NENE
T29S	R32E	18	SENE
T29S	R32E	18	NESE
T29S	R32E	18	SESE
T29S	R31E	22	NENE
T29S	R31E	23	NWNW
T29S	R31E	23	SWNW
T29S	R31E	23	NENW
T29S	R31E	23	SENW
T29S	R31E	23	NESW
T29S	R31E	23	NWNE
T29S	R31E	23	SWNE
T29S	R31E	23	NWSE
T29S	R31E	23	SWSE
T29S	R31E	23	NENE
T29S	R31E	23	SENE
T29S	R31E	23	NESE
T29S	R31E	23	SESE
T29S	R31E	24	NWNW
T29S	R31E	24	SWNW

Township	Range	Section	Qtr/Qtr
T29S	R31E	24	NWSW
T29S	R31E	24	SWSW
T29S	R31E	24	NENW
T29S	R31E	24	SENW
T29S	R31E	24	NESW
T29S	R31E	24	SESW
T29S	R31E	24	NWNE
T29S	R31E	24	SWNE
T29S	R31E	24	NWSE
T29S	R31E	24	SWSE
T29S	R31E	24	NENE
T29S	R31E	24	SENE
T29S	R31E	25	NWNW
T29S	R31E	25	SWNW
T29S	R31E	25	NWSW
T29S	R31E	25	NENW
T29S	R31E	25	SENW
T29S	R31E	25	NESW
T29S	R31E	25	NWNE
T29S	R31E	25	SWNE
T29S	R31E	25	NWSE
T29S	R31E	25	SESW
T29S	R31E	25	SWSE
T29S	R31E	26	SESW
T29S	R31E	26	NWNE
T29S	R31E	26	SWNE
T29S	R31E	26	NWSE
T29S	R31E	26	SWSE
T29S	R31E	26	NENE
T29S	R31E	26	SENE
T29S	R31E	26	NESE
T29S	R31E	26	SESE
T29S	R31E	34	SESW
T29S	R31E	34	SWSE
T29S	R31E	34	NESE
T29S	R31E	34	SESE
T29S	R31E	35	NWSW
T29S	R31E	35	SWSW
T29S	R31E	35	NENW
T29S	R31E	35	SENW
T29S	R31E	35	NESW
T29S	R31E	35	SESW
T29S	R31E	35	NWNE
T29S	R31E	35	SWNE
T29S	R31E	1	NWNW
T29S	R31E	1	SWNW
T29S	R31E	1	NWSW
T29S	R31E	1	SWSW
T29S	R31E	1	NENW
T29S	R31E	1	SENW
T29S	R31E	1	NESW
T29S	R31E	1	SESW
T29S	R31E	1	NWNE
T29S	R31E	1	SWNE
T29S	R31E	1	NWSE
T29S	R31E	1	SWSE
T29S	R31E	2	NWNW
T29S	R31E	2	SWNW
T29S	R31E	2	NWSW
T29S	R31E	2	SWSW
T29S	R31E	2	NENW
T29S	R31E	2	SENW
T29S	R31E	2	NESW
T29S	R31E	2	SESW
T29S	R31E	2	NWNE
T29S	R31E	2	SWNE
T29S	R31E	2	NWSE
T29S	R31E	2	SWSE

Township	Range	Section	Qtr/Qtr
T29S	R31E	2	NENE
T29S	R31E	2	SENE
T29S	R31E	2	NESE
T29S	R31E	2	SESE
T29S	R31E	3	NWNW
T29S	R31E	3	SWNW
T29S	R31E	3	NWSW
T29S	R31E	3	SWSW
T29S	R31E	3	NENW
T29S	R31E	3	SENW
T29S	R31E	3	NESW
T29S	R31E	3	SESW
T29S	R31E	3	NWNE
T29S	R31E	3	SWNE
T29S	R31E	3	NWSE
T29S	R31E	3	SWSE
T29S	R31E	3	NENE
T29S	R31E	3	SENE
T29S	R31E	3	NESE
T29S	R31E	3	SESE
T29S	R31E	10	NWNW
T29S	R31E	10	NENW
T29S	R31E	10	SENW
T29S	R31E	10	SWNW
T29S	R31E	10	NESW
T29S	R31E	10	SESW
T29S	R31E	10	NWNE
T29S	R31E	10	SWNE
T29S	R31E	10	NWSE
T29S	R31E	10	SWSE
T29S	R31E	10	NENE
T29S	R31E	10	SENE
T29S	R31E	10	NESE
T29S	R31E	10	SESE
T29S	R31E	11	NWNW
T29S	R31E	11	SWNW
T29S	R31E	11	NWSW
T29S	R31E	11	SWSW
T29S	R31E	11	NENW
T29S	R31E	11	SENW
T29S	R31E	11	NESW
T29S	R31E	11	SESW
T29S	R31E	11	NWNE
T29S	R31E	11	SWNE
T29S	R31E	11	NWSE
T29S	R31E	11	SWSE
T29S	R31E	11	NENE
T29S	R31E	11	SENE
T29S	R31E	11	NESE
T29S	R31E	11	SESE
T29S	R31E	12	NWNW
T29S	R31E	12	SWNW
T29S	R31E	12	NWSW
T29S	R31E	12	SWSW
T29S	R31E	12	NENW
T29S	R31E	12	SENW
T29S	R31E	12	NESW
T29S	R31E	12	SESW
T29S	R31E	12	NWNE
T29S	R31E	12	SWNE
T29S	R31E	12	NWSE
T29S	R31E	12	SWSE
T29S	R31E	12	SENE
T29S	R31E	12	NESE
T29S	R31E	12	SESE
T29S	R31E	4	NWNE
T29S	R31E	4	NENE
T29S	R31E	4	SENE

Township	Range	Section	Qtr/Qtr
T29S	R31E	13	NWNW
T29S	R31E	13	SWNW
T29S	R31E	13	NWSW
T29S	R31E	13	SWSW
T29S	R31E	13	NENW
T29S	R31E	13	SENW
T29S	R31E	13	NESW
T29S	R31E	13	SESW
T29S	R31E	13	NWNE
T29S	R31E	13	SWNE
T29S	R31E	13	NWSE
T29S	R31E	13	SWSE
T29S	R31E	13	NENE
T29S	R31E	13	SENE
T29S	R31E	13	NESE
T29S	R31E	13	SESE
T29S	R31E	14	NWNW
T29S	R31E	14	SWNW
T29S	R31E	14	NWSW
T29S	R31E	14	SWSW
T29S	R31E	14	NENW
T29S	R31E	14	SENW
T29S	R31E	14	NESW
T29S	R31E	14	SESW
T29S	R31E	14	NWNE
T29S	R31E	14	SWNE
T29S	R31E	14	NWSE
T29S	R31E	14	SWSE
T29S	R31E	14	NENE
T29S	R31E	14	SENE
T29S	R31E	14	NESE
T29S	R31E	14	SESE
T29S	R31E	15	NENW
T29S	R31E	15	SENW
T29S	R31E	15	NWNE
T29S	R31E	15	SWNE
T29S	R31E	15	NWSE
T29S	R31E	15	SWSE
T29S	R31E	15	NENE
T29S	R31E	15	SENE
T29S	R31E	15	NESE
T29S	R31E	15	SESE
T30S	R32E	18	NWSW
T30S	R32E	18	NESW
T30S	R32E	18	SWSW
T30S	R32E	18	SESW
T30S	R32E	18	NWSE
T30S	R32E	18	NESE
T30S	R32E	18	SWSE
T30S	R32E	18	SESE
T30S	R32E	19	NWNW
T30S	R32E	19	SWNW
T30S	R32E	19	NENW
T30S	R32E	19	SENW
T30S	R32E	19	NWSW
T30S	R32E	19	NESW
T30S	R32E	19	NWNE
T30S	R32E	19	SWNE
T30S	R32E	19	NWSE
T30S	R32E	19	SWSE
T30S	R32E	19	NENE
T30S	R32E	19	SENE
T30S	R32E	19	SESE
T30S	R32E	19	NESE
T30S	R32E	20	NWNW
T30S	R32E	20	SWNW
T30S	R32E	20	NENW

Township	Range	Section	Qtr/Qtr
T30S	R32E	20	SENW
T30S	R32E	20	NWSW
T30S	R32E	20	SWSW
T30S	R32E	20	SESW
T30S	R32E	20	NESW
T30S	R32E	20	SWSE
T30S	R32E	20	SESE
T30S	R32E	27	SWSW
T30S	R32E	27	SWSE
T30S	R32E	27	SESW
T30S	R32E	28	NWNW
T30S	R32E	28	SENW
T30S	R32E	28	NWSE
T30S	R32E	28	SESE
T30S	R32E	29	NWNW
T30S	R32E	29	SWNW
T30S	R32E	29	NENW
T30S	R32E	29	SENW
T30S	R32E	30	NENE
T30S	R32E	33	NENE
T30S	R32E	34	NWNW
T30S	R32E	34	NWNE
T30S	R32E	34	NENE
T30S	R31E	22	NWNW
T30S	R31E	22	SWNW
T30S	R31E	22	NWSW
T30S	R31E	22	SWSW
T30S	R31E	22	NENW
T30S	R31E	22	SENW
T30S	R31E	22	NESW
T30S	R31E	22	SESW
T30S	R31E	22	NWNE
T30S	R31E	22	SWNE
T30S	R31E	22	NWSE
T30S	R31E	22	SWSE
T30S	R31E	22	NENE
T30S	R31E	22	SENE
T30S	R31E	22	NESE
T30S	R31E	22	SESE
T30S	R31E	23	NWSW
T30S	R31E	23	SWSW
T30S	R31E	23	NENE
T30S	R31E	24	NWNW
T30S	R31E	24	NENW
T30S	R31E	24	NWNE
T30S	R31E	24	NENE
T30S	R31E	24	SENE
T30S	R31E	24	SENW
T30S	R31E	24	SWNE
T30S	R31E	26	NWNW
T30S	R31E	26	SWNW
T30S	R31E	26	NWSW
T30S	R31E	26	SWSW
T30S	R31E	27	NWNW
T30S	R31E	27	SWNW
T30S	R31E	27	NWSW
T30S	R31E	27	SWSW
T30S	R31E	27	NENW
T30S	R31E	27	SENW
T30S	R31E	27	NESW
T30S	R31E	27	SESW
T30S	R31E	27	NWNE
T30S	R31E	27	SWNE
T30S	R31E	27	NWSE
T30S	R31E	27	SWSE
T30S	R31E	27	NENE
T30S	R31E	27	SENE

Township	Range	Section	Qtr/Qtr
T30S	R31E	27	NESE
T30S	R31E	27	SESE
T30S	R31E	34	NWNW
T30S	R31E	34	SWNW
T30S	R31E	34	NWSW
T30S	R31E	34	SWSW
T30S	R31E	34	NENW
T30S	R31E	34	SENW
T30S	R31E	34	NESW
T30S	R31E	34	SESW
T30S	R31E	34	NWNE
T30S	R31E	34	SWNE
T30S	R31E	34	NWSE
T30S	R31E	34	SWSE
T30S	R31E	34	NENE
T30S	R31E	34	SENE
T30S	R31E	34	NESE
T30S	R31E	34	SESE
T30S	R31E	35	NWNW
T30S	R31E	35	SWNW
T30S	R31E	35	NWSW
T30S	R31E	35	SWSW
T30S	R31E	35	NENW
T30S	R31E	35	SENW
T30S	R31E	35	NESW
T30S	R31E	35	SESW
T30S	R31E	35	NWNE
T30S	R31E	35	SWNE
T30S	R31E	35	NWSE
T30S	R31E	35	SWSE
T30S	R31E	35	SENE
T30S	R31E	35	NESE
T30S	R31E	35	SESE
T30S	R31E	21	NESE
T30S	R31E	21	SESE
T30S	R31E	28	SENE
T30S	R31E	28	NWSE
T30S	R31E	28	SWSE
T30S	R31E	28	NENE
T30S	R31E	28	SENE
T30S	R31E	28	NESE
T30S	R31E	28	SESE
T30S	R31E	33	SESW
T30S	R31E	33	NWNE
T30S	R31E	33	SWNE
T30S	R31E	33	NWSE
T30S	R31E	33	SWSE
T30S	R31E	33	NENE
T30S	R31E	33	SENE
T30S	R31E	33	NESE
T30S	R31E	33	SESE
T30S	R31E	2	SWSW
T30S	R31E	3	SWSW
T30S	R31E	3	NENW
T30S	R31E	3	SENW
T30S	R31E	3	NESW
T30S	R31E	3	SESW
T30S	R31E	3	NWNE
T30S	R31E	3	SWNE
T30S	R31E	3	NWSE
T30S	R31E	3	SWSE
T30S	R31E	3	NENE
T30S	R31E	3	SENE
T30S	R31E	3	NESE
T30S	R31E	3	SESE
T30S	R31E	10	NWNW
T30S	R31E	10	SWNW
T30S	R31E	10	NWSW

Township	Range	Section	Qtr/Qtr
T30S	R31E	10	SWSW
T30S	R31E	10	NENW
T30S	R31E	10	SENW
T30S	R31E	10	NESW
T30S	R31E	10	SESW
T30S	R31E	10	NWNE
T30S	R31E	10	SWNE
T30S	R31E	10	NWSE
T30S	R31E	10	SWSE
T30S	R31E	10	NENE
T30S	R31E	10	SENE
T30S	R31E	10	NESE
T30S	R31E	10	SESE
T30S	R31E	11	NWNW
T30S	R31E	11	SWNW
T30S	R31E	11	NWSW
T30S	R31E	11	SWSW
T30S	R31E	11	NENW
T30S	R31E	11	SENW
T30S	R31E	11	NESW
T30S	R31E	11	SESW
T30S	R31E	11	SWSE
T30S	R31E	11	SESE
T30S	R31E	12	SWSW
T30S	R31E	13	SWNW
T30S	R31E	13	NWSW
T30S	R31E	13	SWSW
T30S	R31E	13	NESW
T30S	R31E	13	SESW
T30S	R31E	13	SWSE
T30S	R31E	13	NWNW
T30S	R31E	13	NENW
T30S	R31E	13	SENW
T30S	R31E	13	SWNE
T30S	R31E	13	SENE
T30S	R31E	13	NWSE
T30S	R31E	13	NESE
T30S	R31E	13	SESE
T30S	R31E	14	NWNW
T30S	R31E	14	NENW
T30S	R31E	14	SENW
T30S	R31E	14	NESW
T30S	R31E	14	SESW
T30S	R31E	14	NWNE
T30S	R31E	14	SWNE
T30S	R31E	14	NWSE
T30S	R31E	14	SWSE
T30S	R31E	14	NENE
T30S	R31E	14	SENE
T30S	R31E	14	NESE
T30S	R31E	14	SESE
T30S	R31E	15	SWSW
T30S	R31E	15	NENW
T30S	R31E	15	SENW
T30S	R31E	15	NESW
T30S	R31E	15	SESW
T30S	R31E	15	NENE
T30S	R31E	15	NWNE
T30S	R31E	15	SWNE
T30S	R31E	15	NWSE
T30S	R31E	15	SWSE
T31S	R32.5E	7	NWNW
T31S	R32.5E	7	SWNW
T31S	R32.5E	7	NWSW
T31S	R32.5E	7	SWSW
T31S	R32.5E	7	NENW
T31S	R32.5E	7	SENW

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	7	NESW
T31S	R32.5E	7	SESW
T31S	R32.5E	7	NWNE
T31S	R32.5E	7	SWNE
T31S	R32.5E	7	NWSE
T31S	R32.5E	7	SWSE
T31S	R32.5E	7	NENE
T31S	R32.5E	7	SENE
T31S	R32.5E	7	NESE
T31S	R32.5E	7	SESE
T31S	R32.5E	8	NWNW
T31S	R32.5E	8	SWNW
T31S	R32.5E	8	NWSW
T31S	R32.5E	8	SWSW
T31S	R32.5E	8	NENW
T31S	R32.5E	8	NESW
T31S	R32.5E	8	SESW
T31S	R32.5E	8	NWNE
T31S	R32.5E	8	SWNE
T31S	R32.5E	8	NWSE
T31S	R32.5E	8	SWSE
T31S	R32.5E	8	SENW
T31S	R32.5E	8	NENE
T31S	R32.5E	8	SENE
T31S	R32.5E	8	NESE
T31S	R32.5E	8	SESE
T31S	R32.5E	9	NWNW
T31S	R32.5E	9	SWNW
T31S	R32.5E	9	NWSW
T31S	R32.5E	9	SWSW
T31S	R32.5E	9	NENW
T31S	R32.5E	9	SENW
T31S	R32.5E	9	NESW
T31S	R32.5E	9	SESW
T31S	R32.5E	9	NWNE
T31S	R32.5E	9	NENE
T31S	R32.5E	16	NWNW
T31S	R32.5E	16	SWNW
T31S	R32.5E	16	NENW
T31S	R32.5E	16	SENW
T31S	R32.5E	16	NWNE
T31S	R32.5E	16	NESW
T31S	R32.5E	16	NWSW
T31S	R32.5E	16	SWSW
T31S	R32.5E	16	SESW
T31S	R32.5E	17	NWNW
T31S	R32.5E	17	SWNW
T31S	R32.5E	17	NWSW
T31S	R32.5E	17	SWSW
T31S	R32.5E	17	NENW
T31S	R32.5E	17	SENW
T31S	R32.5E	17	NESW
T31S	R32.5E	17	SESW
T31S	R32.5E	17	NWNE
T31S	R32.5E	17	SWNE
T31S	R32.5E	17	NWSE
T31S	R32.5E	17	SWSE
T31S	R32.5E	17	NENE
T31S	R32.5E	17	SENE
T31S	R32.5E	17	NESE
T31S	R32.5E	17	SESE
T31S	R32.5E	6	SWNW
T31S	R32.5E	6	NWSW
T31S	R32.5E	6	SWSW
T31S	R32.5E	6	SENW
T31S	R32.5E	6	NESW
T31S	R32.5E	6	SESW
T31S	R32.5E	6	SWNE

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	6	NWSE
T31S	R32.5E	6	SWSE
T31S	R32.5E	6	NESE
T31S	R32.5E	6	SESE
T31S	R32.5E	6	SENE
T31S	R32.5E	5	SWNW
T31S	R32.5E	5	NWSW
T31S	R32.5E	5	SWSW
T31S	R32.5E	5	SENW
T31S	R32.5E	5	NESW
T31S	R32.5E	5	SESW
T31S	R32.5E	5	NWSE
T31S	R32.5E	5	SWSE
T31S	R32.5E	5	SENE
T31S	R32.5E	5	NESE
T31S	R32.5E	5	SESE
T31S	R32.5E	5	SWNE
T31S	R32.5E	4	NWSW
T31S	R32.5E	4	SWSW
T31S	R32.5E	4	NESW
T31S	R32.5E	4	SESW
T31S	R32.5E	4	NWSE
T31S	R32.5E	4	SWSE
T31S	R32.5E	4	NESE
T31S	R32.5E	4	SESE
T31S	R32.5E	4	SWNW
T31S	R32.5E	4	SENW
T31S	R32.5E	4	SENE
T31S	R32.5E	4	SWNE
T31S	R32.5E	3	SWNW
T31S	R32.5E	3	NWSW
T31S	R32.5E	3	SWSW
T31S	R32.5E	18	NWNW
T31S	R32.5E	18	SWNW
T31S	R32.5E	18	NWSW
T31S	R32.5E	18	SWSW
T31S	R32.5E	18	NENW
T31S	R32.5E	18	SENW
T31S	R32.5E	18	NESW
T31S	R32.5E	18	SESW
T31S	R32.5E	18	NWNE
T31S	R32.5E	18	SWNE
T31S	R32.5E	18	NWSE
T31S	R32.5E	18	SWSE
T31S	R32.5E	18	NENE
T31S	R32.5E	18	SENE
T31S	R32.5E	18	NESE
T31S	R32.5E	18	SESE
T31S	R32.5E	19	NWNW
T31S	R32.5E	19	SWNW
T31S	R32.5E	19	NWSW
T31S	R32.5E	19	SWSW
T31S	R32.5E	19	NENW
T31S	R32.5E	19	SENW
T31S	R32.5E	19	NESW
T31S	R32.5E	19	SESW
T31S	R32.5E	19	NWNE
T31S	R32.5E	19	SWNE
T31S	R32.5E	19	NWSE
T31S	R32.5E	19	SWSE
T31S	R32.5E	19	NENE
T31S	R32.5E	19	SENE
T31S	R32.5E	19	NESE
T31S	R32.5E	19	SESE
T31S	R32.5E	20	NWNW
T31S	R32.5E	20	SWNW
T31S	R32.5E	20	NWSW
T31S	R32.5E	20	SWSW

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	20	NENW
T31S	R32.5E	20	SENW
T31S	R32.5E	20	NESW
T31S	R32.5E	20	SESW
T31S	R32.5E	20	NWNE
T31S	R32.5E	20	SWNE
T31S	R32.5E	20	NWSE
T31S	R32.5E	20	SWSE
T31S	R32.5E	20	NENE
T31S	R32.5E	20	SENE
T31S	R32.5E	20	NESE
T31S	R32.5E	20	SESE
T31S	R32.5E	21	NWNW
T31S	R32.5E	21	SWNW
T31S	R32.5E	21	NWSW
T31S	R32.5E	21	SWSW
T31S	R32.5E	21	NENW
T31S	R32.5E	21	SENW
T31S	R32.5E	21	NESW
T31S	R32.5E	21	SESW
T31S	R32.5E	21	NWNE
T31S	R32.5E	21	SWNE
T31S	R32.5E	21	SESE
T31S	R32.5E	21	NWSE
T31S	R32.5E	21	SWSE
T31S	R32.5E	28	NWNW
T31S	R32.5E	28	SWNW
T31S	R32.5E	28	NWSW
T31S	R32.5E	28	SWSW
T31S	R32.5E	28	NENW
T31S	R32.5E	28	SENW
T31S	R32.5E	28	NESW
T31S	R32.5E	28	SESW
T31S	R32.5E	28	NWNE
T31S	R32.5E	28	SWNE
T31S	R32.5E	28	NWSE
T31S	R32.5E	28	SWSE
T31S	R32.5E	29	NWNW
T31S	R32.5E	29	SWNW
T31S	R32.5E	29	NWSW
T31S	R32.5E	29	SWSW
T31S	R32.5E	29	NENW
T31S	R32.5E	29	SENW
T31S	R32.5E	29	NESW
T31S	R32.5E	29	SESW
T31S	R32.5E	29	NWNE
T31S	R32.5E	29	SWNE
T31S	R32.5E	29	NWSE
T31S	R32.5E	29	SWSE
T31S	R32.5E	29	NENE
T31S	R32.5E	29	SENE
T31S	R32.5E	29	NESE
T31S	R32.5E	29	SESE
T31S	R32.5E	30	NWNW
T31S	R32.5E	30	SWNW
T31S	R32.5E	30	NWSW
T31S	R32.5E	30	SWSW
T31S	R32.5E	30	NENW
T31S	R32.5E	30	SENW
T31S	R32.5E	30	NESW
T31S	R32.5E	30	SESW
T31S	R32.5E	30	NWNE
T31S	R32.5E	30	SWNE
T31S	R32.5E	30	NWSE
T31S	R32.5E	30	SWSE
T31S	R32.5E	30	NENE
T31S	R32.5E	30	SENE
T31S	R32.5E	30	NESE

Township	Range	Section	Qtr/Qtr
T31S	R32.5E	30	SESE
T31S	R32.5E	31	NWNW
T31S	R32.5E	31	SWNW
T31S	R32.5E	31	NWSW
T31S	R32.5E	31	SWSW
T31S	R32.5E	31	NENW
T31S	R32.5E	31	SENW
T31S	R32.5E	31	NESW
T31S	R32.5E	31	SESW
T31S	R32.5E	31	NWNE
T31S	R32.5E	31	SWNE
T31S	R32.5E	31	NWSE
T31S	R32.5E	31	SWSE
T31S	R32.5E	31	NENE
T31S	R32.5E	31	SENE
T31S	R32.5E	31	NESE
T31S	R32.5E	31	SESE
T31S	R32.5E	32	NWNW
T31S	R32.5E	32	SWNW
T31S	R32.5E	32	NWSW
T31S	R32.5E	32	SWSW
T31S	R32.5E	32	NENW
T31S	R32.5E	32	SENW
T31S	R32.5E	32	NESW
T31S	R32.5E	32	SESW
T31S	R32.5E	32	NWNE
T31S	R32.5E	32	SWNE
T31S	R32.5E	32	NWSE
T31S	R32.5E	32	SWSE
T31S	R32.5E	32	NENE
T31S	R32.5E	32	SENE
T31S	R32.5E	32	NESE
T31S	R32.5E	32	SESE
T31S	R32.5E	33	NWNW
T31S	R32.5E	33	SWNW
T31S	R32.5E	33	NWSW
T31S	R32.5E	33	SWSW
T31S	R32.5E	33	NENW
T31S	R32.5E	33	SENW
T31S	R32.5E	33	NESW
T31S	R32.5E	33	SESW
T31S	R32.5E	33	NWNE
T31S	R32.5E	33	SWNE
T31S	R32.5E	33	NWSE
T31S	R32.5E	33	SWSE
T31S	R32E	1	NESE
T31S	R32E	1	SESE
T31S	R32E	12	SWSE
T31S	R32E	12	NENE
T31S	R32E	12	SENE
T31S	R32E	12	NESE
T31S	R32E	12	SESE
T31S	R32E	13	NESW
T31S	R32E	13	SESW
T31S	R32E	13	NWNE
T31S	R32E	13	SWNE
T31S	R32E	13	NWSE
T31S	R32E	13	SWSE
T31S	R32E	13	NENE
T31S	R32E	13	SENE
T31S	R32E	13	NESE
T31S	R32E	13	SESE
T31S	R32E	23	SESE
T31S	R32E	24	NWSW
T31S	R32E	24	SWSW
T31S	R32E	24	NENW
T31S	R32E	24	SENW

Township	Range	Section	Qtr/Qtr
T31S	R32E	24	NESW
T31S	R32E	24	SESW
T31S	R32E	24	NWNE
T31S	R32E	24	SWNE
T31S	R32E	24	NWSE
T31S	R32E	24	SWSE
T31S	R32E	24	NENE
T31S	R32E	24	SENE
T31S	R32E	24	NESE
T31S	R32E	24	SESE
T31S	R32E	25	NWNW
T31S	R32E	25	SWNW
T31S	R32E	25	NWSW
T31S	R32E	25	SWSW
T31S	R32E	25	NENW
T31S	R32E	25	SENW
T31S	R32E	25	NESW
T31S	R32E	25	SESW
T31S	R32E	25	NWNE
T31S	R32E	25	SWNE
T31S	R32E	25	NWSE
T31S	R32E	25	SWSE
T31S	R32E	25	NENE
T31S	R32E	25	SENE
T31S	R32E	25	NESE
T31S	R32E	25	SESE
T31S	R32E	26	NENE
T31S	R32E	26	SENE
T31S	R32E	26	NESE
T31S	R32E	26	SESE
T31S	R32E	35	NESW
T31S	R32E	35	SESW
T31S	R32E	35	SWNE
T31S	R32E	35	NWSE
T31S	R32E	35	SWSE
T31S	R32E	35	NENE
T31S	R32E	35	SENE
T31S	R32E	35	NESE
T31S	R32E	35	SESE
T31S	R32E	36	NWNW
T31S	R32E	36	SWNW
T31S	R32E	36	NWSW
T31S	R32E	36	SWSW
T31S	R32E	36	NENW
T31S	R32E	36	SENW
T31S	R32E	36	NESW
T31S	R32E	36	SESW
T31S	R32E	36	NWNE
T31S	R32E	36	SWNE
T31S	R32E	36	NWSE
T31S	R32E	36	SWSE
T31S	R32E	36	NENE
T31S	R32E	36	SENE
T31S	R32E	36	NESE
T31S	R32E	36	SESE
T32S	R32.5E	8	SWSW
T32S	R32.5E	8	NWSW
T32S	R32.5E	8	SWNW
T32S	R32.5E	8	NWNW
T32S	R32.5E	8	NENW
T32S	R32.5E	8	NWNE
T32S	R32.5E	7	NWSW
T32S	R32.5E	7	SWNW
T32S	R32.5E	7	NWNW
T32S	R32.5E	7	NESW
T32S	R32.5E	7	SENW
T32S	R32.5E	7	NENW

Township	Range	Section	Qtr/Qtr
T32S	R32.5E	7	NWNE
T32S	R32.5E	7	SWNE
T32S	R32.5E	7	NWSE
T32S	R32.5E	7	NESE
T32S	R32.5E	7	SENE
T32S	R32.5E	7	NENE
T32S	R32.5E	6	SWSW
T32S	R32.5E	6	NWSW
T32S	R32.5E	6	SWNW
T32S	R32.5E	6	NWNW
T32S	R32.5E	6	SESW
T32S	R32.5E	6	NESW
T32S	R32.5E	6	SENW
T32S	R32.5E	6	NENW
T32S	R32.5E	6	NWNE
T32S	R32.5E	6	SWNE
T32S	R32.5E	6	NWSE
T32S	R32.5E	6	SWSE
T32S	R32.5E	6	NENE
T32S	R32.5E	6	SENE
T32S	R32.5E	6	NESE
T32S	R32.5E	6	SESE
T32S	R32.5E	5	SWSW
T32S	R32.5E	5	NWSW
T32S	R32.5E	5	SWNW
T32S	R32.5E	5	NWNW
T32S	R32.5E	5	NENW
T32S	R32.5E	5	SENW
T32S	R32.5E	5	NESW
T32S	R32.5E	5	SESW
T32S	R32.5E	5	SWSE
T32S	R32.5E	5	NWSE
T32S	R32.5E	5	SWNE
T32S	R32.5E	5	NWNE
T32S	R32.5E	5	NENE
T32S	R32.5E	5	SENE
T32S	R32.5E	5	NESE
T32S	R32.5E	4	NWNW
T32S	R32.5E	4	SWNW
T32S	R32.5E	4	SENW
T32S	R32.5E	4	NENW
T32S	R32.5E	4	NWSW
T32S	R32.5E	4	NESW
T32S	R32.5E	4	NWNE
T32S	R32.5E	4	SWNE
T32S	R32.5E	4	NWSE
T32S	R32E	1	NWNW
T32S	R32E	1	SWNW
T32S	R32E	1	NWSW
T32S	R32E	1	SWSW
T32S	R32E	1	NENW
T32S	R32E	1	SENW
T32S	R32E	1	NESW
T32S	R32E	1	SESW
T32S	R32E	1	NWNE
T32S	R32E	1	SWNE
T32S	R32E	1	NWSE
T32S	R32E	1	SWSE
T32S	R32E	1	NENE
T32S	R32E	1	SENE
T32S	R32E	1	NESE
T32S	R32E	1	SESE
T32S	R32E	2	NWNE
T32S	R32E	2	SWNE
T32S	R32E	2	NENE
T32S	R32E	2	SENE
T32S	R32E	2	NESE

Township	Range	Section	Qtr/Qtr
T32S	R32E	2	SESE
T32S	R32E	11	NWNE
T32S	R32E	11	NENE
T32S	R32E	11	SENE
T32S	R32E	12	NWNW
T32S	R32E	12	SWNW
T32S	R32E	12	SENW
T32S	R32E	12	NENW
T32S	R32E	12	NWSE
T32S	R32E	12	NWNE
T32S	R32E	12	SWNE
T32S	R32E	12	NENE
T32S	R32E	12	SENE
T32S	R32E	12	NESE

STATE OF OREGON
WATER RESOURCES DEPARTMENT

RECEIPT # 31547

158 12TH ST. N.E.
SALEM, OR 97310-0210
378-8455 / 378-8130 (FAX)

INVOICE #_____

RECEIVED FROM: United States Treasury
BY: _____

APPLICATION	
PERMIT	
TRANSFER	T-8311

CASH: ☐ CHECK: #5-51 ☑ OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 32,600.00

0417 WRD MISC CASH ACCT

	ADJUDICATIONS	$
	PUBLICATIONS / MAPS	$
_____	OTHER: (IDENTIFY)	$
_____	OTHER: (IDENTIFY)	$

RECEIVED OVER THE COUNTER

REDUCTION OF EXPENSE

CASH ACCT. _____ $ _____

PCA AND OBJECT CLASS _____ VOUCHER # _____

0427 WRD OPERATING ACCT

PCA #66011
Ref #31545, 31546, 31547, 31548, 31549

	MISCELLANEOUS	
0407	COPY & TAPE FEES	$
0410	RESEARCH FEES	$
0408	MISC REVENUE: (IDENTIFY)	$
(New) TC162	DEPOSIT LIAB. (IDENTIFY)	$

		EXAM FEE		RECORD FEE
	WATER RIGHTS:			
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$ 500.00	0206	$
	WELL CONSTRUCTION	**EXAM FEE**		**LICENSE FEE**
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

_____ OTHER (IDENTIFY) _____

0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD #
0210	MONITORING WELLS	$	CARD #

_____ OTHER (IDENTIFY) _____

0539 LOTTERY PROCEEDS

1302	LOTTERY PROCEEDS	$

0467 HYDRO ACTIVITY

		LIC NUMBER	
0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HRDRO APPLICATION	_____	$

RECEIPT # 31547 DATED: 7-28-99 BY: Roger Wright

Distribution-White Copy-Customer, Yellow Copy-Fiscal, Blue Copy-File, Buff Copy-Fiscal

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

August 2, 1999

U.S.Fish & Wildlife Service
911 NE 11th Avenue
Portland, OR 97232-4181

REFERENCE: Transfer 8311

On 07-28-99 we received your water right transfer application requesting a change in POU/USE for use of water from Donner und Blitzen River. The application was accompanied by $ 500.00. Our receipt 31547 is enclosed.

By copy of this letter, we are asking the Watermaster for his usual report regarding the potential for injury to existing water rights which may be caused by the change.

Your application will be examined to determine if additional information is needed. You will be contacted following this examination. If you have a specific reason why your application should be examined ahead of other applications, please send us a letter describing your reason. We may be able to examine your application ahead of others.

You may not use water for the new use, or in the new place of use until the transfer application has been approved. In order to avoid any possible forfeiture of the water right, you should continue to use the water as described by your existing water right. If the land is sold before the transfer is approved, you will need to obtain consent from the buyer to complete the transfer.

We will notify you if additional information or corrections to the application or map are required.

If you have any questions, please call the Transfer Section, (800) 624-3199 or (503) 378-3739.

cc: Watermaster #10, Mitch Lewis
CWRE #299, Robert W/ Glaeser

enclosure

Oregon
John A. Kitzhaber, M.D., Governor

Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

August 2, 1999

Wayne Bowers
Oregon Department of Fish and Wildlife
P.O. Box 8
Hines, OR 97738

Reference: Transfer # **8311**

Enclosed for your review is a copy of a water right transfer application from **DONNER und BLITZEN RIVER**, tributary of **MALHEUR LAKE**.

Consistent with the Oregon Plan, we are soliciting your input on whether the proposed transfer would injure an instream water right or any other water right in which ODFW has an interest. If you believe that the transfer would injure a water right, please describe the nature of the injury and provide any supporting information which you have available.

This transfer is not for a permanent or historic change in a point of diversion. Therefore, the provisions of ORS 540.525 and 540.532 related to requirements for fish screens or by-pass devices do not apply.

We must receive your response in our Baker City office

Attention: Larry Nunn
Water Resources Department
158 12th Street NE
Salem OR 97310-0210

by September 3, 1999 in order to consider it in our decision on the application and to include the appropriate conditions in any approval order. We will presume that you do not have comments and do not intend to request fish screens or by-pass devices if we do not receive a response.

If you have questions, please call (541)523-5224.

Enclosure

cc: Wm # **10**, Mitch Lewis
Applicant

County:	HARNEY
Transfer:	8311
Certificate:	15197
Priority Date:	1885
Name:	U.S. FISH and WILDLIFE SERVICE
Address:	911 NE 11th AVENUE, PORTLAND 97232
Change:	POU/USE
Source:	DONNER und BLITZEN RIVER
Authorized **POU**:	MALHEUR WILDLIFE REFUGE
Proposed **POU**:	MALHEUR REFUGE MANAGEMENT
Authorized **USE**:	IRRIGATION/DOMESTIC/STOCK
Proposed **USE**:	WILDLIFE REFUGE MANAGEMENT

TRANSFER CHECK OFF LIST

TRANSFER FILE # 8311
DATE RECEIVED 7-28-99
DATE MONEY SLIPPED OTC
DATE RECEIPTED 7-28-99
VALID WATER RIGHT? _____Yes_____No
TEMP ALT AC____(Gary) IRR DIST____(Gary) PERM AMEND____(Kelly) DIV 15____or Temp Div15 (Larry)

LETTER FROM ATTORNEY _____YES (PUT INFO ON FRONT COVER) ___X___NO

FOLDER FILLED OUT* 7-29-99
INDEX CARD 7-29-99
ENTERED IN DB 7-29-99
TYPE BLACK BOOK 7-29-99 (And color code)
RECORD MONEY/RECEIPT # 7-29-99
CONTENTS MARKED 7-29-99
COLOR CODED ____Yes
4 COPIES MADE & STAMPED 7-30-99

CERTIFICATE MARKED 7-29-99
CERTIFICATE COPIED 7-29-99
PULL APPLICATIONS _____
APP FOLDER MARKED _____
FINAL PROOF MAP COPIED _____
PERMIT MARKED _____
PERMIT COPIED _____
PERMIT MAP COPIED _____
DECREE MARKED _____
DECREE COPIED _____
ADJUDICATION MAP COPIED _____

ENTRIES CHECKED _____ CHECKED BY _____ INIT FOLDER_____
PUBLIC NOTICE DATE 8-3-99 (PREPARED & COPIED) _____
LETTER SENT _____ Irrigation District _____(copy of app & map)
COPY TO WM _____
BLUE FORM TO WM _____ Orange Perm Amend/Yellow Temp/grn dist/lav alt acr
COPY TO GW _____ POA, APOA, or [SW TO GW ONLY(as POD)]
BLUE FORM TO GW _____ Orange Perm Amend/Yellow Temp/Grn Dist/Lav Alt Acr
COPY TO CWRE _____
LETTER TO ODFW _____ ALL Surface water POU/USE (POD and APOD FISH SCREENS)
TRANSFER SENT TO: _____ --- NCR --- SCR --- ER

*SHRINK DATA IF THERE ARE MANY FILES INVOLVED AND TAPE TO FOLDER