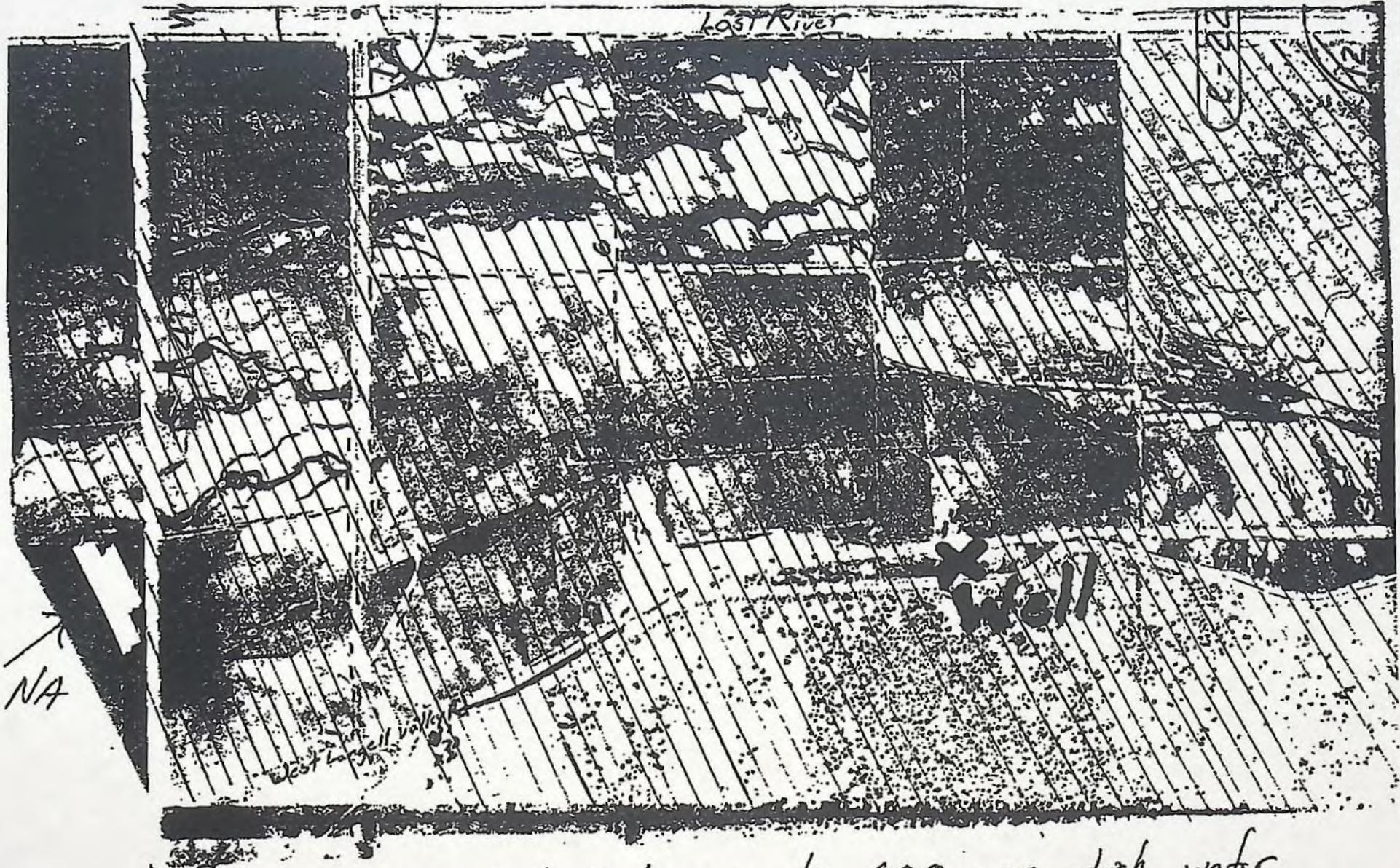


Application No. 6-13184
Permit No.



Lines show land that represents 600 acres which water may be applied if proposed well allows us to.

May 15, 1995

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

Re: Denial of Objections to Application File Numbers:

G 12493	G 12494	G 13514	Circle Five Ranch
G 12618			Haskins & Co Inc
G 12644			Lost River Ranch
G 12732			Earl Weirisma
G 12735			George Teague
G 12746			Donald Horsley
G 12766			William B. Hill
G 12768			Elso DeJong
G 12772			Carl Gibson
G 12777	G 12808		Halousek Brothers
G 12811			Lynn R. Pope
G 12814			Donald R. Manning
G 12860			Weyerhaeuser Co.
G 12874			Kenneth Masten
G 12876			Charles Masten and Ned Goecken
G 12885			S. C. Masten
G 12885			Gary Williams (Peggy Biaggi)
G 12935			John Dark
G 12955			B. Bennett & J. Connelly
G 12972	G 13184		Balin Ranches
G 12994			Charles Cheyne
G 13011			W. E. Hammerich
G 13019			Wells Farms Inc.
G 13101			Barrett Livestock
G 13106			Grohs Ranch
G 13387			William DeJong

Dear Ms. Russell:

The Director of the Water Resources Department has reviewed the Objections filed jointly by WaterWatch and Oregon Natural Resources Congress to the proposed water use reported in the Satisfactory Report of Technical Review announced for the application files listed above. In light of the agreement that was reached between the Oregon Department of Fish and Wildlife (ODFW), Bureau of Reclamation (BOR) and the above-listed applicants, the Director has determined that all of your Objections to the proposed uses are hereby denied.



Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

Karen Russell, Assistant Director
May 15, 1995
Page Three

public interest. You have not set forth facts which would support allegations that the proposed water use is prohibited.

You may protest this denial of your Objections. You have thirty (30) days from the date of this letter to file a protest. Your protest must comply with the standards set out in the Oregon Administrative Rules, Chapter 690, Division Two, Sections 030 through 080. (OAR 690-02-030 through 080).

Send your protest by regular mail or deliver it in person. Your protest must be received by the Water Resources Department in Salem, Oregon, no later than 5:00 p.m. on or before June 15, 1995. Your protest must be in proper form and accompanied by a fee of \$25.00.

If you have any questions, please call.

Sincerely,

Dwight Frensd FOR

Steven P. Applegate, Administrator
Water Rights and Adjudications Division

Enclosures: Conditions

cc: Applicants
Michael Ryan, Bureau of Reclamation
Roger Smith, Oregon Department of Fish and Wildlife
Kip Lombard, Attorney, City of Bonanza
files



United States Department of the Interior



BUREAU OF RECLAMATION

MID-PACIFIC REGION

KLAMATH PROJECT

6600 WASHBURN WAY

KLAMATH FALLS, OREGON 97603-9365

IN REPLY
REFER TO:

CERTIFIED RETURN RECEIPT REQUESTED

NOV 10 1993

RECEIVED

KO-400
WTR-4.10

NOV 12 1993

WATER RESOURCES DEPT.
SALEM, OREGON

Oregon Water Resources Department
3850 Portland Road NE
Salem OR 97310

Subject: Protest of Application for Groundwater Use in the Bonanza, Oregon Area (Water Rights Protest)

We have recently become aware of Agenda Item E for the October 1, 1993, meeting of the Water Resources Commission. The information presented in this agenda item briefing indicates a strong possibility that a connection exists between groundwater and surface water supplies in the Bonanza, Oregon area. A follow-up conversation with Fred Listner, Oregon Department of Water Resources, indicated that a technical evaluation supporting the connection between groundwater and surface water will be forthcoming in the near future.

WHO OWNS THE WATER

The U.S. Bureau of Reclamation (Reclamation) depends on the flows from Bonanza Springs to satisfy contractual agreements with Horsefly Irrigation District and to satisfy pre-project rights to the use of Lost River water. The Lost River watershed is over-appropriated and it has been the policy of Reclamation to protest all surface water applications that would require water use during the irrigation season. Accordingly, in January 1991, the Klamath Project requested the Water Resources Commission close the Lost River to further appropriations. To our knowledge, this was not acted upon by the Commission.

Until a method is developed by the State of Oregon to adequately determine the extent of depletion of the springs in the Bonanza area caused by groundwater pumping during the irrigation season, we must object to the granting of any non-domestic groundwater permits in the Bonanza area. As you are aware, any depletions would have to be replaced with stored water from Reclamation reservoirs located above Bonanza (Gerber and Clear Lake Reservoirs). Specifically, the following applications are being objected to:

Application Number	Name of Applicant	Address	Town	State
G 12768	DeJong, Elso & Arie	4771 Harpold Rd.	Bonanza	OR
G 13184	Balin Ranches	13600 Homedale Rd.	Klamath Falls	OR
G 13198	Gallup, Robert & Kelly	11234 W. Langell Valley Rd.	Bonanza	OR
G 13387	DeJong, William	6735 Bunn Rd.	Bonanza	OR

If you have any questions, please contact Jim Bryant at (503) 883-6935.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Ryan". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael J. Ryan
Project Manager

WaterWatch

Hand Delivered

June 8, 1995

RECEIVED

Oregon Water Resources Department
Water Rights Section
158 12th Street NE
Salem, Oregon 97310

JUN 08 1995

WATER RESOURCES DEPT.
SALEM, OREGON

Re: Protest of Applications:
G-13184, 12972, Balin Ranches, Irrigation, Lost River Basin

Dear Water Rights Section:

On May 17, 1995, WaterWatch received the Department's denial of WaterWatch's and ONRC's objections to the above referenced application. The public interest and policy issues raised in WaterWatch's objections were either not addressed, or not satisfactorily addressed, by the Department's denial letter. WaterWatch files this protest and a \$25 for each application (\$50 for both applications) pursuant to OAR 690-11-175(5) and 690-02-030 to 080. ONRC supports our protest of this application. We incorporate by reference our objection to this application.

A. Facts

These are two of approximately 40 applications pending in the Lost River Basin. The applicant proposes to divert **7.956 cfs (4.456 cfs from application G-13184, 3.5 cfs from G-12972)** for irrigation from a well in the Lost River Basin. The Department found that this use is in hydraulic connection with the Lost River and that this use **will have the potential to cause substantial interference with surface water.** See technical review.¹

The Resource

The Ground Water Resource

Ground water in the Bonanza area is directly connected to the Lost River. WRC Agenda Item E, October 1, 1993 at 3 (hereinafter Agenda Item E). The most prominent ground water discharge is Bonanza Big Springs. Id. Ground water pumping from **already**

¹The applicant received a letter from the Department on 10/4/94 stating that if the applicant could prove that the use of groundwater would not interfere with the Lost River surface water, this information should be submitted to the Department. We found no such information in the file.

Existing ground water use has, at times, resulted in reversal of the hydraulic gradient of the aquifer flow such that the Lost River is actually drawn into the ground water through Bonanza Springs. Agenda Item E at 2. This has been identified by the Oregon Health Division as one of the causes of ground water contamination in the area. Id. See also Preliminary Assessment of Occurrence of Bacterial Contamination of Ground Water in Bonanza, Oregon, Nelson, Oregon Health Division at 2. This ground and surface water quality contamination problem is an **ongoing** chronic problems that has been aggravated in the past few years by the area wide drought. Oregon Department of Human Resources - Sanitary Survey Report, City of Bonanza.

The Surface Water Resource

Quantity

The flow in the Lost River arises from storage releases of BOR projects and groundwater discharges. Agenda Item E, at 3. The Lost River is overappropriated and "much of the flow of the Lost River is due to storage releases." Id. and Letter to Water Resources Department, from Bureau of Reclamation, 11/10/93. Concern over the overappropriated condition of the resource lead the Klamath Project to request that the Commission close the Lost River to further appropriations in January of 1991. Id. The Commission declined to initiate withdrawal proceedings in June of 1992. The Bureau of Reclamation has a policy of protesting all new surface water applications for use during the irrigation season because of concerns that further depletions of streamflows would have to be replaced with stored water. Id.

Quality

The Department of Environmental Quality (DEQ) has identified the Lost River from river mile 0 to 65 as water quality limited. See Oregon's 1994 Water Quality Status Assessment Report, 305(b) Report, A-17, A-18. From river mile 0 to river mile 7.7 the Lost River's water quality violates dissolved oxygen level standards. It is incapable of supporting the designated beneficial use of aquatic life during the summer months. This section of the river also violates water quality parameters for pH, nutrients and algae rendering only partially able to support the listed beneficial uses of aquatic life and aesthetics during the summer months. From river mile 7 to 60 (the segment containing Bonanza Springs) the water quality violations are year round for dissolved oxygen and fecal coliform parameters such that the listed beneficial uses of aquatic life and water contact are not supported. Agricultural practices have been identified by DEQ as a possible cause of these water quality problems.

The Fish Resource

The Lost River supports two endangered suckers, the short nose and lost river suckers. The United States Fish and Wildlife Service (USFWS) Lost River (*Deltistes*

luxatus) and Shortnose (*Chasmistes brevirostris*) Sucker Recovery Plan provides a good description of the history of these suckers:

Lost River and shortnose suckers are endemic to the upper Klamath Basin of Oregon and California (Map, page 11). Within their range, early records indicate that the Lost River and shortnose suckers were widespread and abundant. Cope (1884) noted that Upper Klamath Lake sustained "a great population of fishes" and was "more prolific in animal life" than any body of water known to him at that time. Gilbert (1898) noted that the Lost River sucker was "the most important food-fish of the Klamath Lake region." At that time, spring sucker runs "in incredible numbers" (Gilbert 1898) were relied upon as a food source by the Klamath and Modoc Indians and were taken by local settlers for both human consumption and livestock feed (Cope 1879, Coots 1965, Howe 1968). Sucker runs were so numerous that a cannery was established on the Lost River (Howe 1968) and several other commercial operations processed "enormous amounts" of suckers into oil, dried fish, and other products (Andreasen 1975).

Recovery Plan at 4. The decline of these suckers has been recognized since the mid-1960's, but the severity of the decline was not recognized until the 1980's. Recovery Plan Executive Summary.

In 1988 both species were listed under the federal Endangered Species Act as endangered. Executive summary. These species are also listed under the Oregon Endangered Species Act. By that time, entire stocks had already disappeared from sections of the Klamath Basin. *Id.* Both species of sucker are found in the Lost River. The Lost River and shortnose suckers are lake dwelling but spawn in tributary streams or springs. Recovery plan at 9, Executive Summary. Recent studies indicate that Bonanza Big Springs provides critical spawning habitat to at least some of these sucker populations. Recovery Plan at 9.

The USFWS has identified water diversion and water quality problems associated with agricultural practices as some of the causes of the decline of these species. *Id.* "Reduction and degradation of lake and stream habitat in the Upper Klamath Basin has been proposed by the (USFW) Service as the major factor in the decline of both species." Executive. Summ. The recovery actions identified by the USFWS in the recovery plan for the suckers include improving habitat conditions by, among other things, developing and achieving water quality and water quality goals, improving fish habitat and improving land management practices. Executive summary. To date, no streamflow goals have been established for suckers in the Lost River.

The Proposed Use

This application is one of approximately 40 pending applications in the Lost River Basin, bringing the total amount of proposed new groundwater uses to 166.3 cfs of water for irrigation use in the basin (approximately 43 cfs for primary irrigation use, approximately 47 cfs for supplemental irrigation use and the remainder is for both primary and supplemental irrigation use). These applicants are likely looking to ground water as a source of water supply because existing surface water supplies, whether from natural flow or Bureau of Reclamation (BOR) projects in the basin, are insufficient to meet new and existing irrigation needs. This surface water shortage is due, in part, to changes in reservoir operations made to protect habitat for Lost River and shortnose sucker species listed as endangered under both the federal and state Endangered Species Acts.

The Department conducted its own study of surface water/ground water interaction in the Lost River Basin and found that there is a direct hydraulic connection between ground and surface waters. See WRD Groundwater Open File Report, Groundwater Investigation of Bonanza Springs Yonna, Poe and Langell Valleys Klamath County, OR, Kyle G. Gorman, Report 94-01. Based on information in its study, the Department, in completing a technical review for this application, found that the proposed use had the potential to cause substantial interference with the resource. The Department issued a satisfactory technical review to this application acknowledging the connection but concluding that the use could go forward if a number of specific conditions were attached to the proposed permit. The Department invited all applicants, including this one, to submit information that might refute their findings regarding surface water/groundwater interference. No such information rebutting this finding has been submitted by this or any other applicant. Thus, based on the Department's own study, the use of water under this application will affect surface water flows in the Lost River.

WaterWatch filed objections to this permit because of documented resource problems in the basin and concerns that the Department's conditions did not protect instream flows and water quality needed for endangered suckers and other instream uses. Among other things, our objections criticized the proposed permit conditions because:

- The issuance of temporary permits does **nothing** to halt the further degradation of the resources in the Lost River. The fact that the water use is "temporary" ignores the fact that the resource, **without** these new uses of water, is already in critical condition.
- The permit only allows the permittee to be shut off if the use harms **existing senior** water right holders. There are not water rights, senior or otherwise, that protect instream values in this river system. Thus, these conditions do not allow the Commission to regulate the new permittee to protect instream values such as water quality or endangered species.
- There is no public notice or opportunity to comment on permit renewals.

•There are not clear standards for renewal. The conditions allows renewal of the temporary permits if the surface flows are not "significantly diminished"; requires a "plan" for alternative long-term water supply; if ground water levels have not "excessively declined"; and water level reports have been "timely submitted."

The Department acknowledged that our objections raised valid public interest issues. See WRD letter to applicant dated 1/13/95, re: ADR proceedings.

In March, WaterWatch participated in alternative dispute resolution proceedings with the applicants and other objectors. In this process new permit conditions were proposed which did not receive support from all the parties in the negotiations. Specifically, WaterWatch did not agree to the newly proposed conditions because we found that they failed to address the public interest issues raised in our objections, issues that were acknowledged by the Department to be valid.

The new conditions are even less protective of the resource than the Department's original conditions. For example, the original conditions required expiration of the permit at the end of five years. At the permit's expiration the conditions allowed, upon the determination of a number of findings, for permit extension. The new conditions delete the provision requiring automatic expiration of the permit at the end of the five years. Instead it states that the permit may expire or be extended five years from the date of the issuance of the permit.² Moreover, this condition now requires the permit be certificated at the end of five years upon the determination of a number of findings.

The new conditions also alter language that is attached to every permit, including those at issue in the Lost River basin, that states that:

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

This condition now reads:

This permit is for the beneficial use without waste.

See Attachments, the Department's original conditions and the newly proposed conditions.

Despite the fact WaterWatch found that the Department's original conditions were not resource protective enough, the Department has since changed its original position by

² This language is not as stringent as the Department's originally proposed conditions because the new language allows the extension of the permit without any findings with regards to the resource.

accepting the new less resource protective conditions and concluding that our concerns had been addressed.

B. Relief Requested

WaterWatch requests that this application be denied, or in the alternative, sent to contested case. If a contested case is scheduled, we request that review of this application be consolidated with review of other pending applications for the Lost River Basin. These applications raise issues of basin wide significance that should be resolved before decisions are made on each individual application.

C. Name and address of Persons having Interest in Proceeding

The following people are known to WaterWatch as having an interest in this proceeding:

BALIN RANCHES
13600 HOMEDALE RD
KLAMATH FALLS, OR 97603

Stephanie Birchfield/Albert Mirati
ODFW
2501 SW First Ave.
PO Box 59
Portland, OR 97207

Roger Smith
ODFW, Klamath Falls
1400 Miller Island Road West
Klamath Falls, OR 97603

Teena Baker
Bureau of Reclamation
6600 Washburn Way
Klamath Falls, OR 97603

Klamath Tribes
Bud Ullman
Box 957
Chiloquin, OR 97624

Wendall Wood

ONRC
Box 667
Chiloquin, OR 97624

Kip Lombard
Attorney for City of Bonanza
Lombard Knudsen & Holtey
622 Siskiyou Blvd
Ashland, OR 97520

D. Legal Authority and Basis for Claim

This protest is filed pursuant to OAR 690-11-175(5) and 690-01-030 to 080. Under Oregon law the Department/Commission must deny applications unless the agency can ensure that the use will not impair or be detrimental to the public interest. ORS 537.170. When making the public interest determination, the agency must consider, among other things, conserving the water for all purposes including fish, wildlife and recreation, the control of the water resource, water availability and Oregon's water resources policies. ORS 537.170(5). The Division 11, Division 400 and Division 410 rules further refine the public interest standards set out in the statute. In addition, when considering this application, the agency has a duty to ensure that water is available for the proposed use in light of other competing uses and that the quality of surface waters will not be impaired. ORS 537.170(5)(a) & (c), ORS 537.525(9), (11), ORS 468B.155, and ORS 468B.015.

The federal and state Endangered Species Acts also place a burden on the Commission. Under the state act the Commission is required to consult with the Oregon Department of Fish and Wildlife to ensure that any action taken by the Commission is consistent with ODFW programs to conserve the species, or, if no plan is in place, that the action will not "reduce the likelihood of the survival or recovery" of the state listed species. ORS 496.182(2). Under the federal Act, there is a prohibition against "taking" of endangered species. 16 USCA § 1538(a)(1)(B). Taking is defined in Section (3)(18) includes "harm" as well as killing and capturing. 16 USCA § 1532 (19). The regulatory definition of "harm" includes "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 CFR § 17.3. Thus it is clear that actions by the Commission can rise to the level of an unpermitted taking of a species if habitat destruction or modification harms a listed species. See Palilia v. Hawaii Department of Land and Natural Resources, 649 F.Supp. 1070 (D. Hawaii 1986), aff'd, 852 F.2d 1106 (9th Cir. 1988). Significantly, the above referenced Palilia case, the oft-cited case on habitat alteration rising to the level of take involved a state agency allowing goats to destroy the food source of an endangered bird. Taking water from fish is at least as clear a causal connection. Listing under these Acts is a sign, not only of the health of a particular species, but also a warning signal for the health of the human environment.

The proposed use will harm the public interest in the ground and surface water resource because:

- The newly proposed conditions are not in the public interest because they fail to protect surface flows needed for endangered species and other resource values, fail to protect the surface water resource from contamination, fail to ensure efficient and beneficial uses of water and are even less stringent than those originally proposed by the Department. WaterWatch's original objections raised, among other things, concerns about the Department's original proposed permit conditions because they did not protect the resource and the endangered suckers that rely upon it. The conditions submitted by the applicant, and now proposed by the Department, are a step backwards from the original conditions.

The Department, on numerous occasions, invited the applicants' to submit information refuting the findings of interference upon which these conditions were based. No such information was submitted by any of the applicants, including this one. The facts remain the same as they did when the Department formulated their original conditions. The surface and ground water resources are hydraulically connected. There are endangered fish species present. The Lost River is so polluted it has been designated by DEQ as water quality limited. Groundwater pumping has reversed the gradient between ground and surface water causing polluted surface water to flow into the ground and contaminate the ground water resource. The Lost River is over allocated. Faced with these facts, that the Department has agreed to less resource protective conditions is not only not in the public interest, but exhibits a shirking of their responsibilities to both the resource and the public at large.

In their denial letter, the Department again acknowledged that the "Department's Groundwater/Hydrology Section determined that use of water from the wells described in the Technical Reviews for the Applications would have the potential to interfere with the Lost River." See Denial letter to WaterWatch/ONRC, 5/15/95, p. 2. No evidence has been submitted, either by the applicants or by other state agencies, to refute the Department's findings. Thus, to accept changes to the conditions, without proof that there was not potential for interference or that streamflows and springflows needed for fish would in fact be protected, goes against the Department's duty to protect and manage the public resource for the people of the entire state, not just the agricultural interests of the Lost River Basin.

- Neither the original nor the newly proposed conditions do anything to protect the actual streamflows and springflows needed for fish. Nor do they protect flows needed for pollution abatement. The conditions only allow regulation of the use if needed to protect senior water rights. Since there are no senior instream water rights, these conditions do nothing to protect the resource. In addition, even if instream flows were established some time in the future, they would not be senior and thus no regulation of this use would occur, regardless of its effect on the resource.

● This proposed use has the potential to reduce streamflows, thus the Department must do a surface water availability analysis of the Lost River. No such analysis was done. This is contrary to the statewide policy and the public health, safety and welfare. ORS 537.620(5), 537.525. Any analysis must take into account the overappropriated state of the river system and the flows needed to protect endangered fish populations. This is required by the statewide allocation and instream flow polices which require protection of instream flow needs when considering applications for out-of-stream uses. OAR 690-410-070(2) and 690-410-030. There was no analysis in the files evaluating the harmful effects of the proposed use on fish and wildlife petitioned for listing under the state and federal endangered species act. Given the direct effect streamflows and springflows have on the endangered suckers, this omission is not in the public interest.

Moreover, rights of record were not adequately addressed, and the analysis of groundwater availability appears to ignore existing and possible future uses of ground water that are exempt from Oregon's permitting requirements. See WaterWatch/ONRC objection for further explanation.

● This and other pending applications in the Lost River raise a policy issue that the Commission must address: What, if any, new uses of water will be allowed in river systems that support threatened or endangered species? The policy that is reflected in the Departments's proposal to issue these applications with conditions that don't protect the resource is that endangered species will not be protected even if it is shown that the resource that they depend upon is being harmed. Such a policy will inevitably lead the state into conflict with the Endangered Species Act.

Action taken on these Lost River applications will set a precedent for how this issue will be handled in Basins throughout the state. As the Commission is well aware, there are other fish species petitioned for listing throughout the state, which if listed, will present the Commission with the problems similar to those in this situation. In many of these cases, as is the case here, flows to ensure the recovery and survival of the species have not yet been determined. It is not good policy, nor is it in the public interest, to allow new uses of water in streams supporting endangered, threatened or sensitive fish species without knowing what flows are needed for those fish.

● There is no consideration of the cumulative effects this application, along with the many other pending applications, will have on the Lost River Basin. Given the endangered species in this river, the documented pollution problems, the large number of applicants, and the connection between groundwater and surface waters, any decision made must address the cumulative impacts of these applications on the resource. This use, both on its own, and in connection with other pending applications and existing permitted uses will significantly impair the public's interest in the surface water resource.

- There is insufficient water in the system to support this proposed use together with other pending applications, existing water rights and other public uses of water in this area. OAR 690-11-195(3). As noted, the onslaught of groundwater applications in the Lost River Basin is due, in large part, to the regulation of flows by the Bureau of Reclamation. Basically, there are insufficient surface flows to meet agricultural needs. Given the fact that, as noted in the Department's own study, the existing hydraulic connection between the groundwater and surface water resources, depletion of the groundwater resource will lead to further depletion of the surface water resource. The Department has acknowledged this in their finding that use of water contemplated under this permit will have the potential to cause substantial interference. Thus, this use will harm water quality, fish, aquatic life, wildlife, and recreational use in the area by depleting streamflows in the Lost River Basin. OAR 690-11-195(4)(c)(A), (d), (e), (f), (h). Allowing such a use is not in the public interest.
- Measuring and reporting conditions are not adequate to protect the resource. It is our understanding that the Department is proposing to issue the five year permits so that they can collect and analyze information before any final determinations are made. Given this, it is imperative that measuring and reporting be as accurate as possible. Thus, to adequately evaluate water use, there needs to be mandatory measuring and reporting of both rate and duty.
- Measuring and reporting of the static water level may be compromised by the new condition that allows the well constructor, pump installer, and/or the permittee to measure static water levels. The point of the five year temporary permit, as we understand it, is to allow the Department to gather unbiased information on the effect of groundwater pumping on the surface water resource. To allow the permittee, and/or others who may not have the expertise and/or who may be biased, to take these measurements risks the unbiased nature of the data collection procedures.
- The proposed conditions fail to promote water conservation and ensure elimination of waste and improved efficiency of use. OAR 690-410-060(1), ORS 537.460(2). Given the documented resource problems in the basin, the original conditions were inadequate with regards to conservation and efficiency requirements because they didn't require conservation and water management plans to be developed and implemented as a condition of use. The new conditions are most certainly not in the public interest because they omit language that states that "the water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end." In addition, the new conditions only require an alternative long term supply plan for primary uses, rather than all uses, both supplemental and primary, as originally proposed by the Department.

- The new conditions which mandate that a certificate be issued if certain findings can be made is inconsistent with Oregon law because Oregon law only allows a use to be certificated to the extent that the permittee has proven beneficial use without waste within the terms of the permit.
- The proposed use is contrary to other Oregon policies including the Statewide Allocation Policy which requires use within the capacity of the resource and requires that instream flow needs be considered when reviewing applications for new uses. OAR 690-410-070.
- The proposed use is contrary to other statewide policies including those that require protection of native fish, water quality riparian areas and other public uses of water and call for integrated and coordinated water management. ORS 496.435, OAR 690-410-030, OAR 690-410-070, OAR 690-410-050(1), ORS 536.220(1), (2).

In addition, the following requirements of Division 11 and other procedural requirements were not followed:

- The Department's denial states that "(a) public interest determination must be made before a decision is made whether to issue a permit." This statement essentially makes it impossible for WaterWatch, or any interested party, that has raised public interest issues, to determine whether or not their public interest concerns will be addressed at some future date. It also makes it impossible for an interested party that has determined that the proposed conditions do address their public interest to determine whether their concerns will continue to be addressed if the public interest determination is made and when a permit is issued.

The public interest determination should be made before the parties are required to respond to the Department's proposal to issue so that the parties can determine whether their concerns are addressed. This "moving target" approach to public participation does not provide the public with the ability to participate meaningfully in water allocation decisions.

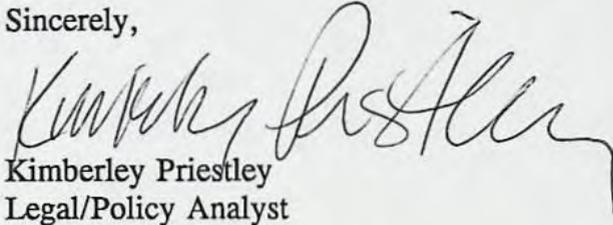
There is nothing in the rules that allow the Department to make changes to conditions without notice to interested parties. While we agree that as new information comes forward, the agency has a duty to ensure that conditions are modified to protect the resource, the Department should give parties in the proceeding notice and an opportunity to comment on any changes.

- The technical report failed to contain many of the elements and evaluations required in OAR 690-11-160(1). The Department's response in the denial letter, these elements were not included in the report in order to "maintain

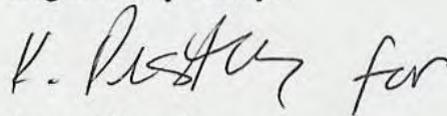
clarity and simplicity" is not supported in the rules. The purpose of the technical report is to give interested parties information that is crucial in order to evaluate whether or not the application is of concern.

For the reasons outlined above and in our objections, which we hereby incorporate by reference, we file this protest.

Sincerely,



Kimberley Priestley
Legal/Policy Analyst



K. Russell for
Karen Russell
Assistant Director

attachments

Certificate of Service

I certify that on this 8th day of June, 1995, a copy of WaterWatch's Protest of Applications G-13184 and G-12972 was served on each of the following by first class mail, postage paid, in the United States Mail from Portland, Oregon, enclosed in a sealed envelope and addressed as follows:

BALIN RANCHES
13600 HOMEDALE RD
KLAMATH FALLS, OR 97603

Stephanie Birchfield/Albert Mirati
ODFW
2501 SW First Ave.
PO Box 59
Portland, OR 97207

Roger Smith
ODFW, Klamath Falls
1400 Miller Island Road West
Klamath Falls, OR 97603

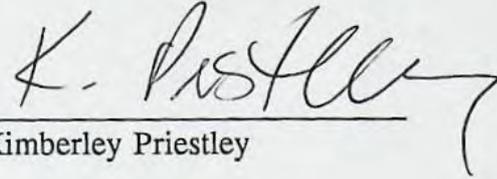
Teena Baker
Bureau of Reclamation
6600 Washburn Way
Klamath Falls, OR 97603

Klamath Tribes
Bud Ullman
Box 957
Chiloquin, OR 97624

Wendall Wood
ONRC
Box 667
Chiloquin, OR 97624

Kip Lombard
Attorney for City of Bonanza
Lombard Knudsen & Holtey
622 Siskiyou Blvd
Ashland, OR 97520

Signed this 8th day of June, 1995

A handwritten signature in cursive script, appearing to read "K. Priestley", written in black ink. The signature is positioned above a horizontal line.

Kimberley Priestley

Certificate of Service

I certify that on this 8th day of June, 1995, a copy of WaterWatch's Protest of Application G-12972 was served on each of the following by first class mail, postage paid, in the United States Mail from Portland, Oregon, enclosed in a sealed envelope and addressed as follows:

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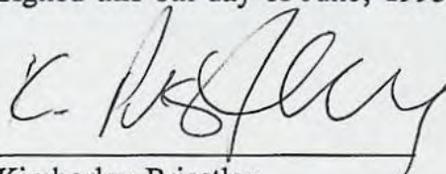
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Signed this 8th day of June, 1995

A handwritten signature in black ink, appearing to read "K. Priestley", written over a horizontal line.

Kimberley Priestley

WaterWatch Attachments to Protest

- 1. Excerpt from Lost River and Short Nosed Sucker Recovery Plan**
- 2. WRD Letter to Applicants, re: WaterWatch raised valid public interest issues**
- 3. Department's Original Permit Conditions**
- 4. Newly Proposed Permit Conditions**
- 5. Staff Reports for Water Resources Commission Meetings on Lost River Basin, June 2, 1994; October 1, 1993; June 5, 1992**

LOST RIVER (*Deltistes luxatus*) AND
SHORTNOSE (*Chasmistes brevirostris*)
SUCKER RECOVERY PLAN

Prepared by

Kevin Stubbs and Rolland White

for

Region 1

U.S. Fish and Wildlife Service
Portland, Oregon

Approved *Manit Plencit*
Regional Director, U.S. Fish & Wildlife Service

Date: 3/17/93

DISCLAIMER PAGE

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect listed species. Plans are published by the U.S. Fish and Wildlife Service (Service), sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. Objectives will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

LITERATURE CITATION: U.S. Fish and Wildlife Service. 1993. Lost River (*Deltistes luxatus*) and Shortnose (*Chasmistes brevirostris*) Sucker Recovery Plan. Portland, Oregon. 95 pp.

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Fish and Wildlife Reference Service:
5430 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814
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EXECUTIVE SUMMARY OF THE RECOVERY PLAN FOR LOST RIVER AND
SHORTNOSE SUCKERS

Current Status: The declining condition of Klamath Basin sucker species has been recognized since the mid-1960's (Andreasen 1975) but it was not until the mid-1980's that the severity of the situation was realized. Lost River and shortnose suckers were subsequently listed as endangered under the Endangered Species Act in 1988. Both species are endemic to the upper Klamath Basin. Significant losses to the gene pool of the suckers may in fact have already occurred with the disappearance of entire stocks (e.g., Harriman Springs, Barkley Springs, Lower Klamath Lake, and possibly others), and drastic reductions in other populations (Upper Klamath Lake, Tule Lake).

Reasons for Decline and Habitat Requirements: The final rule listing the Lost River and shortnose suckers as endangered species suggested the following reasons for their decline: the damming of rivers, dredging and draining of marshes, water diversions, hybridization, competition and predation by exotic species, insularization of habitat, and water quality problems associated with timber harvest, removal of riparian vegetation, livestock grazing, and agricultural practices (Federal Register 53:27130-27134). A shift toward hypereutrophication in Upper Klamath Lake has been documented (Miller and Tash 1967, Vincent 1968) and is considered by the Service to be a probable cause for the decline of Lost River and shortnose suckers and a major limiting factor in recovery of the species. Tule Lake, lower portions of the Lost River, Lake Ewauna, and the upper Klamath River also have severe water quality problems associated with hypereutrophication. Overharvest and chemical contamination also may have contributed to the decline.

Both species of suckers are lake dwelling but spawn in tributary streams or springs. Reduction and degradation of lake and stream habitats in the upper Klamath Basin has been proposed by the Service as the major factor in the decline of both species.

Recovery Objective: Detailed downlisting or delisting criteria can not be proposed at this time.

Recovery Criteria:

The interim objective is to establish at least one stable refugial population with a minimum of 500 adult fish for each unique stock of both Lost River and shortnose suckers.

Actions Needed:

1. Establish safe refuge populations of both listed suckers within the watershed.
2. Conduct research on sucker populations and habitat needs.

3. Improve Lost River and shortnose sucker habitat conditions through rehabilitating riparian areas and improving land management practices in the watershed, developing and achieving water quality and quantity goals, and improving fish passage, spawning habitat, and other habitat conditions.

Costs: (in \$1,000s)

<u>Year</u>	<u>Need 1</u>	<u>Need 2</u>	<u>Need 3</u>	<u>Total</u>
1993	359.0	1111.6	1480.0	2950.6
1994	120.0	775.0	1025.0	1920.0
1995	60.0	530.0	795.0	1385.0
1996	40.0	280.0	335.0	655.0
1997	55.0	210.0	270.0	535.0
1998	0.0	0.0	70.0	70.0
1999	0.0	0.0	180.0	180.0
2000	0.0	0.0	10.0	10.0
2001	0.0	0.0	0.0	0.0
2002	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.0	0.0
2006	0.0	0.0	0.0	0.0
2007	0.0	0.0	0.0	0.0
2008	0.0	0.0	0.0	0.0
2009	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0
2011	0.0	0.0	0.0	0.0
2012	0.0	0.0	0.0	0.0
<u>Total Cost of Recovery</u>	634.0	2906.6	4165.0	7705.6

Date of Recovery: The interim objective of establishing refugia populations for each unique stock should be accomplished by 2012 if research and recovery efforts are coordinated and water quality criteria have been met. A downlisting/delisting target date can not be projected at this time.

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I. INTRODUCTION

A. Brief Overview

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are large, long-lived suckers endemic to the upper Klamath Basin of Oregon and California. Both were originally described by Cope (1879) and both have gone through considerable taxonomic revision. The limited distribution of both sucker species, combined with the level of agricultural development and associated water and land use threats within the drainage, make these fishes susceptible to past and present habitat loss and degradation throughout their distribution. Both Lost River and shortnose suckers were federally listed as endangered species on July 18, 1988 (Federal Register 53:27130-27134). Because the Lost River sucker is the only species in the genus *Deltistes*, this entire genus is endangered as well. The recovery of these fishes and the ecosystem they depend on will require the input and cooperation of numerous Federal, state, county, and city agencies, as well as local organizations and individuals who own or manage basin land and water resources. Many of the tasks in this recovery plan are very similar to actions recommended in the Draft Upper Klamath River Basin Amendment to the Long-Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program, prepared for the Klamath River Basin Fisheries Task Force. Many similar recovery tasks are also in the Klamath Basin Water Users Protective Association's Initial Ecosystem Restoration Plan for the Upper Klamath River Basin (Water Users Plan) and several portions of that plan are incorporated into this recovery plan. Much of the wetland restoration in this recovery plan also is recommended in the North American Waterfowl Management Plan. Implementation of this recovery plan should benefit game fish in the watershed, trout and salmon downstream, amphibians, reptiles, waterfowl, and other wildlife in the basin in addition to the suckers. Most of the sucker populations are within the U.S. Bureau of Reclamation's (Reclamation) Klamath Project area. Pursuant to consultation with Reclamation under section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service (Service) rendered a biological opinion, dated July 22, 1992, on long-term operations of the Klamath Project, which suggests or requires some of the same actions recommended in this recovery plan. The long-term biological opinion also sets minimum lake levels and other restrictions on Klamath Project operations that are not addressed in this plan. This recovery plan incorporates information from, but does not supersede, the long-term biological opinion.

B. Description

Lost River Sucker Taxonomy

The confusing taxonomic history of the Lost River sucker, as described by Andreasen (1975), began with Cope's description of the species as *Chasmistes luxatus* in 1879 (Cope 1879), based on specimens from Upper Klamath Lake. Eigenmann (1891) then re-classified the species as *Catostomus rex* based on analysis of specimens from Tule Lake and the Lost River. Seale (1896) renamed the sucker into a new monotypic genus (*Deltistes*) after an analysis of gill raker morphology, and used the original species name of *luxatus*. Miller (1959) stated that gill raker characteristics were not always diagnostic for the identification of Lost River suckers, and subsequently placed the sucker back in the genus of *Catostomus*, retaining the species name *luxatus*. Miller and Smith (1967) recognized characteristics of the genus *Deltistes*, described by Seale (1896), in their examination of fossil fishes, and concluded that the one living example of this genus was the Lost River sucker, *Deltistes luxatus*.

Identification

Lost River suckers are one of the largest sucker species and may grow to 1 meter in total length (Moyle 1976). Lost River suckers exhibit some variability in traits commonly used to differentiate fish species. The Lost River sucker is distinguished by its long snout (Cope 1879, Andreasen 1975, Moyle 1976) and a wide median notch in the lower lip that has one or two large papillae between the notch and the edge of the lower lip (Andreasen 1975). Lost River suckers can be distinguished from shortnose and Klamath largescale suckers based on vertebral counts (Markle pers. comm.). Lateral line scale counts differ among specimens, with Gilbert (1897) reporting between 76 and 81, Andreasen (1975) between 79 to 83, Moyle (1976) between 82 to 88, and Buettner and Scopettone (1991) 82 to 113. Gill raker numbers also vary; 27 to 28 reported by Andreasen (1975) and 24 to 33 by Moyle (1976). The gill raker counts can increase with age (Markle pers. comm.). The gill rakers are short, triangular in shape (Moyle 1976), as well as widely spaced and smooth on the edges (Andreasen 1975). Moyle describes the small hump on the snout of the Lost River sucker as a key characteristic to its identification. Like most suckers, the coloration of the body is dark on the back and sides and fades to white or yellow on the belly (Moyle 1976).

A general description of the morphological characteristics of juvenile Lost River suckers less than 100 millimeters (mm) in standard length (SL) is provided by Bond (1989):

The lobes of the lower lip are well-separated by a gap and are seldom in contact with each other. A raised ridge or frenum exists between the lobes. The head is

long in length. The caudal peduncle is long and slender and its least depth is about equal to the distance from the back edge of the eye to the upper end of the opercular opening. The depressed anal fin does not reach past the narrowest part of the caudal peduncle. The pigmentation of the fish is rather pale, with brownish mottling or speckling that does not contrast heavily with the ivory or tan background. Gill rakers usually number 25 to 33 and tend to be triangular in shape with smooth edges. Lateral line scales number from 76 to 86.

Buettner and Scoppettone (1990) provide a descriptive key to the eggs, larvae, and juveniles of Lost River suckers sampled from Upper Klamath Lake.

Shortnose sucker- Taxonomy

The shortnose sucker was described by Cope (1879) from specimens collected in Upper Klamath Lake and given the name *Chasmistes brevirostris*. Cope (1881) then placed the shortnose sucker in a new genus (*Lipomyzon*), based on the characteristics of its pharyngeal teeth. After analyzing more specimens, Cope (1884) decided that pharyngeal teeth characteristics did not warrant a new genus, and changed the genus name back to *Chasmistes*. Fowler (1934), in his review of catostomid fishes, apparently did not realize that Cope had reassigned the shortnose sucker into the genus *Chasmistes*, and published the classification of the shortnose sucker as *Lipomyzon brevirostris*. In 1952, the confusion was ended when the shortnose sucker was classified as *Chasmistes brevirostris* in a personal communication between R.R. Miller and C.E. Bond (see Andreasen 1975). The shortnose sucker has since retained this taxonomic classification (Robbins *et al.* 1991).

Identification

As with the Lost River sucker, the morphological characteristics of the adult shortnose sucker are variable. This variation appears related to the two distinct morphologies of the fish associated with Upper Klamath Lake and the Lost River (Buettner pers. comm., Scoppettone pers. comm.). The reason for the two morphs is not known; enzyme electrophoresis showed that fish from a variety of geographically disparate populations did not appear to be genetically distinct (Moyle and Berg 1991). Additional research is scheduled to investigate genetic differences. The variation could be related to differences in habitat or feeding, or could be ontogenic, with larger adults having morphological characteristics described as shortnose and younger individuals deviating from these characteristics (Markle pers. comm., Moyle pers. comm.).

In general, shortnose suckers are usually less than 50 cm SL and are distinguished by a large head, oblique, terminal mouth, and thin lips that have minute or absent papillae (Moyle 1976). Andreasen (1975) describes the shortnose sucker as having approximately 78 lateral line scales and 40 gill rakers. Moyle (1976) found 73 to 82 lateral line scales and 34 to 49 gill rakers. Shortnose suckers are dark in color on the back and silvery to white on the belly (Moyle 1976). Bond (1989) provides a general morphological key to juvenile shortnose suckers less than 100 mm SL:

The lobes of the lower lip are well-separated by a gap and are seldom in contact with each other. A raised ridge or frenum between the lobes is present. The head is short and deep in comparison with that of juvenile Lost River suckers. The body is robust and the caudal peduncle is shorter and deeper than that described for the Lost River sucker. The caudal peduncle's least depth is greater than the distance from the back edge of the eye to the upper end of the opercular opening. The depressed anal fin reaches to below the beginning of the caudal fin. The fishes' pigmentation is dark with gray to black mottling contrasting with a light gray background. The lower portion of the body is nearly white. The gill rakers usually number between 33 and 48 and their edges are armed with processes that become increasingly branched in larger specimens. Lateral line scales number from 74 to 83.

Buettner and Scopettone (1990) provide an in depth morphological key to the eggs, larvae, and juveniles of shortnose suckers in Upper Klamath Lake.

C. Historic Distribution and Population Status

Lost River and shortnose suckers are endemic to the upper Klamath Basin of Oregon and California (Map, page 11). Within their range, early records indicate that the Lost River and shortnose suckers were widespread and abundant. Cope (1884) noted that Upper Klamath Lake sustained "a great population of fishes" and was "more prolific in animal life" than any body of water known to him at that time. Gilbert (1898) noted that the Lost River sucker was "the most important food-fish of the Klamath Lake region." At that time, spring sucker runs "in incredible numbers" (Gilbert 1898) were relied upon as a food source by the Klamath and Modoc Indians and were taken by local settlers for both human consumption and livestock feed (Cope 1879, Coots 1965, Howe 1968). Sucker runs were so numerous that a cannery was established on the Lost River (Howe 1968) and several other commercial operations processed "enormous amounts" of suckers into oil, dried fish, and other products (Andreasen 1975).

The Lost River sucker is native to Upper Klamath Lake (Williams et al. 1985), its tributaries, including the Williamson, Sprague, and Wood rivers, Crooked Creek, Seven Mile Creek, Four Mile Creek, Odessa Creek, and Crystal Creek (Stine 1982), the Lost River system, Tule Lake, Lower Klamath Lake, and Sheepy Lake (Moyle 1976). Andreasen (1975) included Clear Lake as the upstream limit of the sucker in the Lost River system.

The documented native distribution of the shortnose sucker is Upper Klamath Lake and its tributaries (Miller and Smith 1981; Williams et al. 1985), although Moyle (1976) includes Lake of the Woods, Oregon. Andreasen (1975) referred to the Lake of the Woods suckers as another species, *Chasmistes stomias*. Moyle now agrees with Andreasen and considers the Lake of the Woods population of shortnose suckers to have been another species with an unclear taxonomic status (Moyle pers. comm.). The sucker population or species in this lake was extirpated during "fish control" operations in 1952 (Andreasen 1975). It is likely that shortnose suckers also are native to the Lost River system (Scoppettone pers. comm.) and were documented in the Clear Lake watershed in 1955 (Coots 1965). Williams et al. (1985) hypothesized that the fish gained access to the Lost River, and subsequently the other areas, by way of irrigation canals associated with the Bureau of Reclamation's Klamath Project. However, their presence in Clear Lake is evidence that they may be native to the Lost River system. Clear Lake Dam was constructed in 1910 and created an impassible barrier for fish migrating upstream in the Lost River. Construction of the Lost River Diversion Channel that connects the Klamath and Lost River systems did not begin until 1911. The Klamath River and Lost River were connected via a natural slough under high water conditions that may have allowed access under natural conditions prior to construction of irrigation canals.

D. Current Distribution

Lost River suckers

The present distribution of Lost River suckers includes Upper Klamath Lake and its tributaries (Buettner and Scoppettone 1990), Clear Lake Reservoir and its tributaries (Buettner and Scoppettone 1991), Tule Lake and the Lost River up to Anderson-Rose Dam (Scoppettone pers. comm.), and the Klamath River downstream to Copco Reservoir (Beak 1987). A few individual Lost River suckers were observed spawning in the Lost River below the Anderson Rose Dam in 1991, presumably migrating from Tule Lake, where 20 adults and one juvenile were captured in 1992 (Scoppettone pers. comm.). Large suckers that could be Lost River suckers were reported in Iron Gate Reservoir in 1992 (Maria pers. comm.). In the Upper Klamath Lake watershed, spawning runs are primarily limited to the Sprague and Williamson Rivers. However, larval Lost River suckers

were collected in the Wood River and Crooked Creek in 1991 (Markle pers. comm.), which indicates a spawning run still occurs in these streams. Suckers have been reported from Sheepy Lake in 1988 and may represent a resident population but positive species identifications were not made (Johnson pers. comm.).

Shortnose suckers

The present distribution of the shortnose sucker includes Upper Klamath Lake and its tributaries, Klamath River downstream to Iron Gate Reservoir, Clear Lake Reservoir and its tributaries, Gerber Reservoir and its tributaries, the Lost River, and Tule Lake. The Gerber Reservoir population is considered to have been introduced, although the timing of the introduction is not known (Buettner pers. comm.). Shortnose suckers have also been collected in the Upper Klamath River from ~~Link River~~ Dam to Copco Reservoir in recent years (USBR 1992, Maria pers. comm.). A shortnose sucker was collected at the head of Iron Gate Reservoir in 1973 by California Department of Fish and Game biologists. The distribution of shortnose sucker is very similar to that of the Lost River sucker except the shortnose sucker appears to be more widely distributed in the Lost River system.

E. Current Status of Sucker Populations

Upper Klamath Lake

The declining condition of Klamath Basin sucker species has been recognized since the mid-1960's (Andreasen 1975) but it was not until the mid-1980's that the severity of the situation was realized. Surveys in Upper Klamath Lake of sucker spawners in 1984 and 1985 (Bienz and Ziller 1987) produced total population estimates of only 2,650 shortnose in 1984, 8,698 and 6,990 Klamath largescale in 1984 and 1985, respectively, and 23,123 and 11,860 Lost River suckers in 1984 and 1985, respectively. The snag fishery harvest for Upper Klamath Lake spawners declined from approximately 10,000 lake suckers in 1968 (Golden 1969), to only 687 lake suckers in 1985. A fish kill during the summer of 1986 further reduced populations of suckers and apparently eliminated many larger adults (Buettner and Scopettone 1990). Lost River and shortnose suckers were subsequently listed as endangered under the Endangered Species Act in 1988. Significant losses to the gene pool of the Lost River sucker already may have occurred with the disappearance of entire stocks (e.g. Harriman Springs, Barkley Springs, Lower Klamath Lake, Indian Tom Lake, Lake of the Woods) and drastic reductions in other populations (Upper Klamath Lake, Tule Lake) (Bond pers. comm., Scopettone pers. comm.).

In Upper Klamath Lake, recruitment of the Lost River and shortnose suckers to adult size classes is poor, and production of the most recent strong year classes in adult populations, probably occurred

in 1977 and 1978 (Scoppettone pers. comm.). The presence of younger males (males usually mature before females) of both species in the 1992 spawning run in the Sprague River may indicate that new year classes from the early 1980's will be recruiting in larger numbers over the next few years (Dunsmoor pers. comm.). Sexual maturity for Lost River suckers sampled in Upper Klamath Lake occurs between the ages of 6 to 14 years, with most maturing at age 9 (Buettner and Scoppettone 1990). This means that new year classes of Lost River suckers are not present in the spawning populations for about nine years. Shortnose sucker sexual maturity occurs at a slightly younger age (5 to 8 years), which means at least a 5 year wait for evidence of recruitment (Buettner and Scoppettone 1990). A juvenile year class was produced from spawning activity in 1991 and suckers from that year class were still present in significant numbers in the 1992 fall canal salvage (Markle pers. comm.), but because it is not known if most mortalities in any one year class occur in the larval, juvenile, or young adult stages, it is impossible to know if this year class will survive to maturity. Sampling for juveniles in Upper Klamath Lake and canal salvage information indicate that 1992 was probably a poor year for young-of-the-year sucker survival and almost no recruitment from the 1992 year class is expected (Buettner pers. comm.).

A distinct population of Lost River suckers spawns at Sucker Springs on the shores of Upper Klamath Lake from mid-March through mid-April but may begin as early as the first of February (Andreasen 1975, Buettner and Scoppettone 1990, Klamath Tribe 1991). The Klamath Tribe (1991) states that although a large portion of the spring area was covered by rip rap, a population of Lost River suckers has persisted in spawning there. The railroad was built around 1920, and yet the sucker population has persisted until recruitment failures began about 20-25 years ago. The Klamath Tribe (1993) states, "In over 5 years of tagging fish at Sucker Springs (hundreds), and more than 10 years of tagging fish in the Williamson and Sprague Rivers (thousands), we have yet to recapture any Lost River sucker tagged in the river at Sucker Springs and vice versa". This fact, as well as the temporal differences in spawning is certainly sufficient evidence to conclude that these are distinct stocks (Klamath Tribe 1993). Even if full genetic data sets fail to show genetic differences between two groups of fish with dramatically different life histories, the proper management perspective would be to treat the groups as distinct stocks. The Sucker Springs population appears to be comprised of large, older adults, which suggests a lack of recruitment over the last 20 years (Buettner pers. comm.). Population estimates from 1987 to 1989 range from 817 to 1038 adult fish, with the vast majority of spawners exceeding 650 mm fork length (Klamath Tribe 1993). The Sucker Springs population does not reflect recruitment from the 1977 and 1978 year classes observed in the river spawning populations (Dunsmoor pers. comm., Scoppettone pers. comm.).

Shortnose suckers were first observed spawning at Ouxy Springs in April 1992. Lost River suckers also spawn at Ouxy Springs (Klamath Tribe 1993). A population of Lost River suckers spawned at Barkley Spring until 1960, when access was blocked as a result of the development of Hagelstein Park. Harriman Springs is another historical spawning site that is no longer utilized by suckers but for less obvious reasons. Other springs in Upper Klamath Lake also likely provided spawning habitat for distinct populations of endangered suckers.

Clear Lake

Clear Lake supports a large population of shortnose suckers with consistent recruitment and a diverse age structure (Buettner and Scopettone 1991). The status of Lost River suckers in Clear Lake is more uncertain because far fewer fish of this species have been collected in the lake and its tributaries. The population is suspected to be larger than sampling may indicate and the age structure of the fish collected is fairly diverse (Scopettone pers. comm.). However, recent drought conditions have greatly reduced the habitat available for all fish in the Clear Lake watershed and the long-term effects on the sucker populations is unknown. A larger percentage of the Lost River suckers captured in Clear Lake recently have exhibited signs of stress (Buettner pers. comm.). Populations in small reservoirs above Clear Lake may no longer exist due to total or near desiccation during the summer of 1992. Recruitment from 1991 and 1992 year-classes is unlikely due to drought conditions (Scopettone pers. comm.).

Gerber Reservoir

Little is known about the endangered sucker population inhabiting Gerber Reservoir. In May 1992, over 200 shortnose suckers, but no Lost River suckers, were salvaged from Gerber Reservoir. They ranged in size from 78 to 461 mm fork length (FL). The presence of smaller suckers indicates that the population of shortnose suckers in Gerber reservoir has successfully recruited in recent years (Buettner pers. comm.). Juvenile suckers (less than 100 mm FL) were observed in Barnes Valley Creek in 1992, indicating successful reproduction in the creek in 1991 (Buettner pers. comm.). Gerber reservoir has been drawn down to critically low levels for irrigation releases in the last two years. Gerber reservoir reached a minimum elevation of 4796.37 feet (182 surface acres, 835 acre-feet) in October 1992, which is less than 1% of the reservoirs capacity. The reservoir did maintain a population of suckers but aeration was necessary to improve water quality during the summer of 1992. The shortnose suckers sampled in April, 1992 showed signs of stress such as low body weight, poor gonadal development, and reduced growth rates of juveniles, which were probably related to low reservoir levels (Buettner pers. comm.). A survey conducted during late October and early November

of 1992, indicated further degradation in condition factors of the shortnose suckers sampled (Buettner pers. comm.).

Lost River

Koch and Contreras (1973) reported 3 areas from which they captured suckers in their survey of the Lost River, including Harpold Reservoir, the Lost River below River Bridge on the east side of the city of Bonanza, and the Lost River 1 mile downstream from Wilson Dam. At least 3 shortnose suckers have been recorded in Malone Reservoir in earlier surveys and 350 shortnose and 4 Lost River suckers were salvaged from Clear Lake and released into Malone Reservoir during May and June of 1992 (Buettner pers. comm.). Surveys conducted on April 10, 1992 observed approximately 100 shortnose suckers spawning at Big Springs above Harpold Reservoir (Buettner pers. comm.). About 30 days later, several hundred larval suckers were observed in the springs. Thirty-five adult (380 to 490 mm FL) and one juvenile (272 mm FL) shortnose suckers were collected in the Lost River above Harpold Reservoir in 1992. The length-frequency of the suckers sampled does not indicate good recruitment and according to locals, spawning at Big Springs is rare (Buettner pers. comm.). No Lost River suckers were observed in Harpold Reservoir during the 1992 survey.

Tule Lake

Populations of Lost River suckers and shortnose suckers in Tule Lake and Lower Klamath Lake were believed to be extirpated after 1924, when Tule Lake and Lower Klamath Lake were drained for farming (Moyle 1976). However, Lost River and shortnose suckers were observed spawning downstream of Anderson-Rose Dam in May 1991. These fishes may have migrated upstream from Tule Lake, where both species have since been found. In 1992, 18 shortnose and 21 Lost River suckers were captured in Tule Lake. These fish were all tagged and there were no recaptures, which indicates more suckers in the populations but does not allow any estimates of population abundances (Scoppettone pers. comm.). Ongoing research should yield more information on population sizes and composition.

Klamath River Reservoirs

Lost River and shortnose suckers were captured in Copco Reservoir during the 1950's and early 1960's (Coots 1965). By the 1970's very few Lost River suckers were captured and in 1987 Beak Consultants, Inc. captured only one Lost River sucker. Shortnose suckers are still present as an aged population. All shortnose suckers collected in 1987 were older adults (16-33 years old), indicating that neither successful reproduction nor recruitment from upstream sources has occurred since the early 1970's (Buettner and Scoppettone 1991). Radio-tagged shortnose suckers

from Copco Reservoir were followed approximately 2 miles up the Klamath River on apparent spawning migrations and larval suckers were documented migrating back to the reservoir (Beak 1987), but survival to adulthood appears to be limited. Lost River and shortnose suckers have been reported from other reservoirs in the Klamath River system between Upper Klamath Lake and Iron Gate Reservoir but little is known about the suckers in this stretch of river. A shortnose sucker was collected at the head of Iron Gate Reservoir in 1973 by California Department of Fish and Game biologists. Other reports are mostly from observations at fish ladders at J.C. Boyle, Keno and Link River Dams since 1988 (USBR 1992). Several juvenile and adult shortnose and Lost River suckers were captured in J.C. Boyle Reservoir near the Klamath River inflow in August 1988 (Buettner pers. comm.).

F. Life History and Habitat

Lost River and shortnose suckers are large, long-lived and omnivorous suckers that generally spawn in rivers or streams and then return to the lake (Buettner and Scopettone 1990). However, both species have separate populations that spawn near springs in Upper Klamath Lake (Klamath Tribe 1993).

This is a brief summary of life history information and more detailed information is given in several of the references cited in this recovery plan. Relatively little information is currently available on habitat requirements for all life stages. Most of the available data is indicative of habitat utilization, and not necessarily habitat preference. Little is known about the life history traits of the Lost River and shortnose suckers during the winter months.

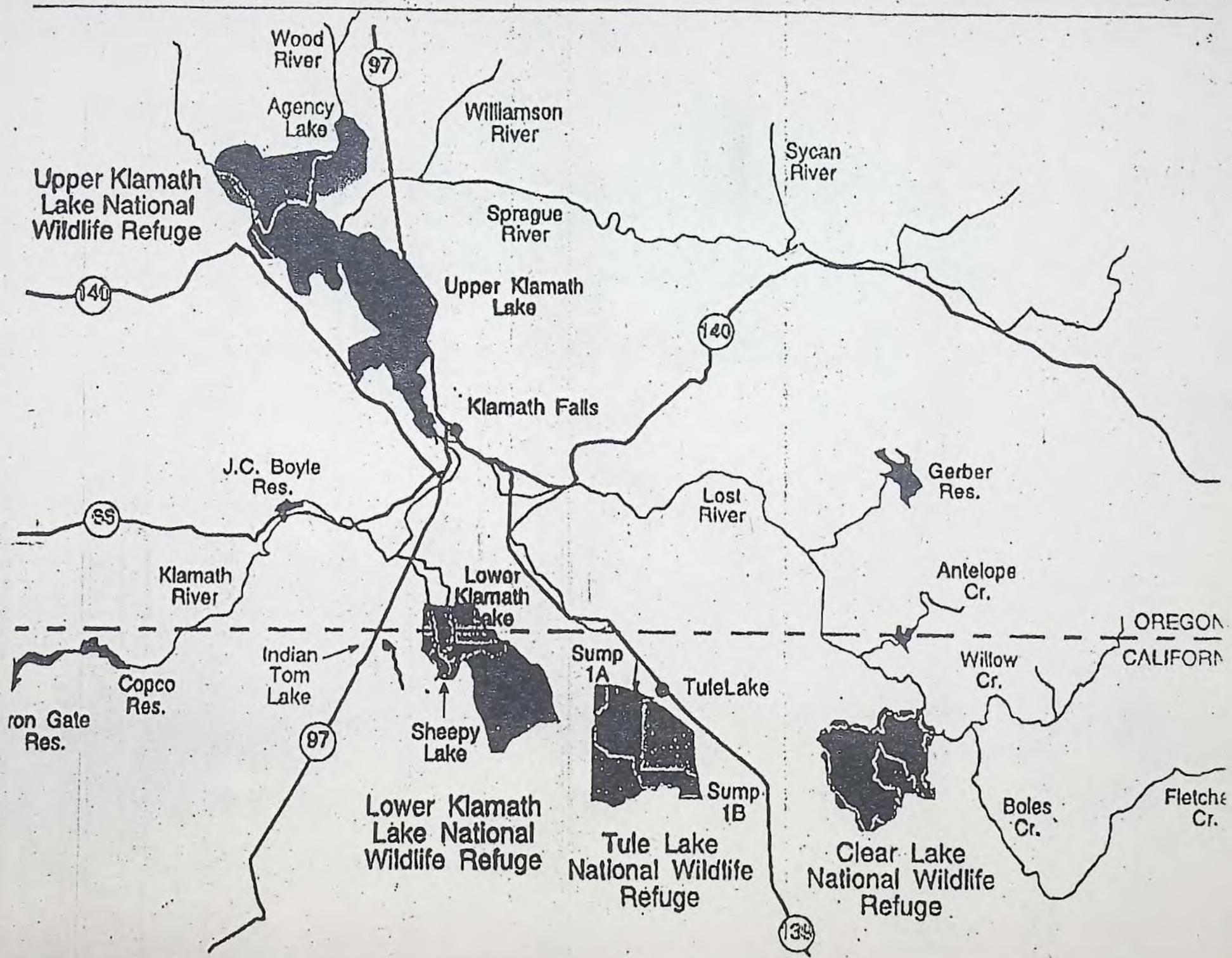
AGE AND GROWTH

Lost River suckers

Scopettone (1988) aged Lost River suckers from Upper Klamath Lake up to 43 years old. Lost River suckers are one of the largest sucker species and may obtain a length of up to 1 meter in total length (Moyle 1976). Sexual maturity for suckers sampled in Upper Klamath Lake occurs between the ages of 6 to 14 years, with most maturing at age 9, with most growth in Upper Klamath Lake occurring mainly during the first 8 to 10 years of life (Buettner and Scopettone 1990).

Shortnose suckers

Scopettone (1988) found shortnose suckers up to 33 years of age from Copco Reservoir. Sexual maturity for shortnose suckers appears to occur between the ages of 5 and 8 with most maturing at the age of 6 or 7 (Buettner and Scopettone 1990). Buettner and



Scoppettone (1990) found that for female shortnose suckers sampled from Upper Klamath Lake, most growth occurred in the first 6 to 8 years of life.

SPAWNING HABITAT

~~Both species of suckers are lake dwelling but spawn in tributary streams or springs.~~ For stream spawning populations, shortnose and Lost River suckers begin their spawning migration into the Williamson and Sprague Rivers in late March or early April, with spawning activity often continuing well into May (Andreasen 1975, Buettner and Scoppettone 1990). For spawning in the Williamson and Sprague Rivers, water depths ranged from 11 to 70 cm and mean water column velocity ranged from 18 to 125 cm/s for Lost River and shortnose suckers (Buettner and Scoppettone 1990). Water temperatures in the Williamson and Sprague Rivers have ranged from 5.5 to 19° C during the spawning period (Golden 1969, Andreasen 1975, Buettner and Scoppettone 1990). In the Clear Lake watershed, the suckers begin spawning activity in February or early March, depending on peak flow in Willow and Boles Creeks (Scoppettone pers. comm.). Spawning at Sucker Springs can occur from February to mid April in water depths ranging from 18 to 61 cm (Buettner and Scoppettone 1990). Water temperature at the spring is a constant 15° C during the spawning period. Shortnose sucker spawning activity was observed at Ouxy Spring in Upper Klamath Lake on April 30, 1992 (Dunsmoor pers. comm.). Lost River and shortnose suckers spawn near the bottom and when gravel is available, eggs are dispersed within the top several centimeters. When spawning occurs over cobble and armored substrate, eggs fall between crevices or are swept downstream (Buettner and Scoppettone 1990). At Sucker Springs, most spawning occurred over a plot of gravel that was introduced during the 1987 spawning season. Large numbers of Lost River suckers were observed using the gravel area in 1987 and 1988 (Buettner pers. comm.), and some spawning activity was recorded in February of 1992 (Dunsmoor pers. comm.). Spawning was rarely observed over the predominant cobble and boulder substrate, suggesting a gravel preference (Buettner and Scoppettone 1990), but more recent observations indicate the preference was more flow related (Klamath Tribe 1993, Scoppettone pers. comm.). More detailed spawning information for both sucker species is provided by Buettner and Scoppettone (1990) and (USBR 1992).

LARVAL AND JUVENILE HABITAT

Larval Lost River and shortnose suckers usually spend relatively little time in tributary streams and migrate back to the lake shortly after swim up. Larval sucker migration from the spawning sites on the Sprague and Williamson Rivers can begin in May or June. Bienz and Ziller (1987) reported that larval sucker emigration surveys were initiated in May of both 1983 and 1984 but no suckers were sampled until mid June of both years. Buettner

and Scopettone (1990) found that in 1987 and 1988 over 90 percent of larval Lost River sucker emigrated back to Upper Klamath Lake between 5 May and 15 June. They found that the majority of larval shortnose sucker emigrated within a six-week period after 1 May in 1978 and after 7 May in 1988. It appears that most larval emigration for both species occurs between the hours of 8:00 P.M. and 07:00 A.M. (Coleman and McGie 1988, Buettner and Scopettone 1990). During the day, the larvae typically move to shallow shoreline areas in the river (Dunsmoor pers. comm.). Ninety percent of larvae were found in water depths less than 50 cm, were surface oriented and over sand, mud and concrete; they were absent from soft organic mud and silt bottom (Buettner and Scopettone 1990).

The channelization of the lower Williamson and Wood Rivers may have negatively affected sucker survival by reducing larval rearing and refuge habitat (Dunsmoor, pers. comm.). Higher densities of larval suckers seem to occur in "pockets of open water surrounded by emergent vegetation" (Klamath Tribe 1991). Coleman and McGie (1988) found sucker larvae during the spring of 1987 in slack, near-shore water at depths less than 30 cm and in close proximity to rooted aquatic vegetation. In the lower Williamson River, the substrate consisted primarily of sand and mud. After emigrating from the parental spawning sites in late spring, larval and juvenile Lost River and shortnose suckers inhabited near shore waters, primarily under 50 cm (19.7 inches) in depth, throughout the summer months (Buettner and Scopettone 1990). Larval and juvenile suckers were found by Buettner and Scopettone (1990) to occur in greatest frequency at 10 to 60 cm depth. Along the lower margins of the Williamson, Buettner found that 35 percent of the larvae were found at sites with emergent vegetation. Coleman and McGie (1988) reported that larvae were found in close proximity to rooted aquatic vegetation, and that they avoided areas devoid of vegetation. Juvenile suckers were found along gentle slopes and were bottom oriented over sand and mud, both in areas devoid of cover and next to macrophytes (Buettner and Scopettone 1990). Although dissolved oxygen in Upper Klamath Lake ranged from 1.3 to 20.0 mg/l in sampling during the summer of 1988, juvenile suckers were only found where concentrations were 4.5 to 12.9 mg/l (Buettner and Scopettone 1990). Few sites with pH values of 9.0 or higher had juvenile suckers (Buettner and Scopettone 1990). In surveys conducted by Oregon State University between July 18 and October 17, 1991, juvenile suckers were found distributed in near shore areas throughout the lake in beach seine and cast net surveys during the summer. Trawling collected suckers in more open water habitat in October (Markle 1992). Although importance of vegetative cover is unknown and sampling in these areas is difficult and limited, larval and juvenile suckers are known to use these areas. Studies to determine habitat preference and survival rates for larval and juvenile suckers are being conducted by Reclamation. The Klamath Tribe (1993) provides the following information. There is little

question that nursery habitat in the lower river is dramatically altered from its historic condition, and that it presently provides poor quality nursery habitat for larval suckers. In fact, this is one of the main reasons behind the water level recommendations made for nursery habitat in Klamath Tribe (1991). The entire delta was once a marsh dominated by emergent vegetation, through which the river meandered. This was a structure-rich environment, and the scientific literature is replete with examples of the value of diverse structure to early life history stages of fish. Given the strong shoreline orientation displayed by sucker larvae, they undoubtedly used the marsh edges as nursery habitat. Indeed, it appears that marsh edges were virtually ubiquitous in the river delta area. Gently sloping, sandy, unvegetated shorelines are common today along the dikes that line the lake and lower river. This type of habitat was probably non-existent historically, and it is unreasonable to assume that such habitats would provide nursery habitats of the same quality as a marsh edge (Klamath Tribe 1993).

ADULT HABITAT

Adult Lost River and shortnose suckers usually spend relatively little time in tributary streams and migrate back to the lake after spawning. Adult Lost River suckers, radio-tagged in the Williamson River and at Sucker Springs in the spring of 1987, gravitated to the northern end of Upper Klamath Lake during the spring and summer. Presumably, this area preference is water-quality related and close proximity to inflow areas may provide refuge when conditions become stressful. Dissolved oxygen levels were at least 6 mg/l where radio-tagged fish were located (Buettner and Scopettone 1990). Only areas of the lake near inflows from streams or springs maintain relatively low densities of algae and consistently provide the water quality needed to support the suckers through stressful periods (Kann pers. comm.). Refugial areas of relatively good water quality are important for fish in Upper Klamath Lake during the summer and early fall when dissolved oxygen and pH levels can be stressful or lethal in much of the lake (Coleman et al. 1988). Bond et al. (1968) reported trout, yellow perch and brown bullheads showed seasonal movements apparently related to heavy algal blooms with attendant fluctuations of dissolved oxygen, pH, and suspended and dissolved materials. These fishes were usually found in the north end of the lake during the summer, or in other areas affected by incoming water. Live-boxed trout failed to survive the combination of high pH, moderate temperature and fluctuating dissolved oxygen at the south end of the Lake (Bond et al. 1968). Hazel (1969) notes that the onset of warm water, *Aphanizomenon* blooms, and high pH seemingly brings about a redistribution of fish from the entire lake to the northern portion of the lake only, particularly along the north and west shore marshes. Hazel (1969) concludes by stating "Because game fish are in abundance in vicinity of marshes during the summer when water quality conditions in the lake are

marginal, there is a good chance that these marshes are necessary for the continued well-being of these fishes. Lost River and shortnose suckers were captured near Pelican Bay, the Wood River, and the Williamson River during summer months of 1986 when water quality was limiting in most of Upper Klamath Lake (Bienz and Ziller 1987). Golden (1969) reported large runs of suckers in the Sprague River during August of 1966 and 1967, which may have been caused by poor water quality in the lake.

G. Reasons for Decline and Current Threats

The final rule listing the Lost River and shortnose suckers as endangered species cited the following reasons for their decline: the damming of rivers, instream flow diversions, hybridization, competition and predation by exotic species, insularization of habitat, dredging and draining of marshes, and water quality problems associated with timber harvest; removal of riparian vegetation, livestock grazing, and agricultural practices (Federal Register 53:27130-27134). A shift toward hypereutrophication in Upper Klamath Lake has been documented (Miller and Tash 1967, Vincent 1968) and is considered by the Service to be a probable cause for the decline of Lost River and shortnose suckers and a major limiting factor in recovery of the species. Tule Lake, lower portions of the Lost River, Lake Ewauna, and the Klamath River above Keno Dam also have severe water quality problems associated with hypereutrophication. Overharvest and chemical contaminants may also have contributed to the decline. Reduction and degradation of lake and stream habitats in the upper Klamath Basin is considered by the Service as the most important factor in the decline of both species.

Dams

The construction in 1914-1918 of the Sprague River Dam, near Chiloquin, Oregon, may have reduced access to approximately 95% of the potential spawning range of Lost River and shortnose suckers in the Sprague River drainage. Records from the Oregon Department of Fish and Wildlife document the passage of Lost River and shortnose suckers from the mid-1960's to 1986. Since 1981, tribal biologists have found both Lost River and shortnose suckers moving through the ladder, and during the snag fishery the ladder was a favorite snagging area for many tribal members catching Lost River suckers. Limited radio telemetry work further documented use of the ladder by endangered suckers. Radio transmitters were placed on three shortnose suckers and one largescale sucker captured at the Williamson River mouth in October, 1983. All four fish ascended to river mile 6.5 on the Williamson River in January, 1984, and then moved upstream and ascended the ladder at the Chiloquin Dam (Klamath Tribe 1993). In recent years few endangered suckers have been captured in the ladder. Few of either sucker species have been observed passing the fish ladder

at Chiloquin Dam (Bienz and Ziller 1987, Buettner and Scopettone 1990). However, little effort has been expended to monitor fish movement through the ladder, so lack of monitoring may be a reason for the perception that the dam blocks passage of suckers. Potential spawning habitat exists in 50 km of the Sprague River, of which 48 km is upstream from the Chiloquin Dam (Buettner and Scopettone 1990). However, the habitat upstream of the dam has been severely degraded. Lack of adequate instream flow and virtual removal of the riparian ecosystem along most of the 70+ river miles upstream of the dam have changed this river to a sediment-laden, hypertrophic system (Klamath Tribe 1993). As a result of the low gradient of much of the Sprague River above the dam, fast-water, rocky habitats used for spawning would occur infrequently. In addition, largemouth bass and yellow perch are very abundant, have completely replaced the native species in some reaches above the dam, and may reduce larval survival through predation (Klamath Tribe 1993). The dam may prevent segregation in location and timing of spawning runs of three sucker species. Although the amount of current spawning habitat available may not be limiting the sucker populations, the concentrations of spawning suckers in relatively small areas of suitable habitat may increase the likelihood of hybridization between species (Scopettone per. comm.). However, since 1990 the Tribe has snorkeled extensively during each spawning season, and have found shortnose and Lost River suckers spawning in more locations in the Sprague River downstream from the dam and at several locations in the Williamson River below the confluence. To say spawning is concentrated completely ignores the ≈ 6.5 km of Williamson River below the confluence that provides spawning habitat for the suckers (Klamath Tribe 1993). Finally, the dam reduces downstream recruitment of suitable spawning gravel and the effect of the free-fall drop over the dam on 13 mm sucker larva attempting to emigrate to the lake is unknown.

Other diversion dams in many of the spawning streams may restrict access to potential spawning areas or impair downstream migration of adults and larval suckers. The Anderson-Rose Dam on the Lost River may limit spawning access for suckers migrating from Tule Lake (Buettner and Scopettone 1991). Dams also fragment populations and restrict genetic mixing within populations.

Although spawning habitat has certainly been reduced and degraded, available evidence does not provide strong support for the hypothesis that spawning habitat availability is limiting recruitment. Field work by Oregon State University and results of Bureau of Reclamation canal salvage operations have shown the successful formation of a year class from the 1991 spawn. In 1989, approximately 70 million sucker larvae emigrated downstream past river mile 6 of the Williamson River, and approximately 5 million sucker larvae emigrated into Upper Klamath Lake (Klamath Tribe 1993). Juvenile fish captured in subsequent field work appeared to belong to the 1989 year class (based on length); but

accurate aging was not possible because fish were released (Klamath Tribe 1993). While year classes of juveniles have been found in recent years, there is no certainty that sufficient numbers of juveniles were produced to provide adequate recruitment to spawning populations 5 to 9 years later.

Diversions

Diversion of water can reduce flows in streams and lower lake elevations. The EPA Clean Lakes study (Klamath Consulting 1983) states "It became apparent during the course of this project that water level in Upper Klamath Lake was a critical factor in relation to several of the problems". They compared the summer of 1981 (one of "reduced lake surface elevation to minimal levels due to drawdown") to the summer of 1982 (one where lake levels were "near maximum"), and state "although algal mats were still present in the lake in massive amounts [in 1982], they did not become the aesthetic nuisance they did the previous summer [1981] ... and water quality, as measured by several parameters did improve" (e.g. pH, chlorophyll and total phosphorus). Klamath Consulting Service (1982) goes on to state that "the increased level of total phosphorus could be the result of increased sediment resuspension caused by wind action over the shallower water in the lake in 1981". A comparison of July and August values for total phosphorus show that 1981 values averaged 138 ug/L higher than for this same period in 1982 (Klamath Consulting 1983). While other factors can influence these annual differences (e.g. climatic differences), the effect of lake level cannot be ruled out.

Diversions of water out of streams and lakes also can entrain suckers, which can be killed by pumps or trapped in the irrigation canals. Any suckers in the water delivery systems, including canals, drains, fields, headgates, and turnouts potentially could be killed or harmed due to low water quality, chemical vegetation control, entrainment in pumps, increased predation, and desiccation (USFWS 1992). Entrainment of larval suckers has been documented at the A Canal headworks (Markle 1992). In 1991, entrainment estimates peaked twice, once in early June (at 43,887 suckers per day) and once in early July (at 21,773 suckers per day). All but one of the suckers collected during the June peak were identified as Lost River suckers (Markle per. comm.). The suckers collected during the July peak were shortnose and Klamath largescale suckers and preliminary identifications indicate that most of these fish are shortnose suckers (Markle per. comm.). The cumulative estimate for the period between May 13 and July 15 was 759,150 larval suckers entrained. The cumulative estimate was extrapolated from a total catch of 51 larval suckers and 35 of the 51 suckers have been identified as Lost River suckers (Markle 1992). The 3,236 suckers of undetermined species salvaged out of the Project canals in October-December of 1991 provides further evidence of entrainment. Entrainment of suckers also occurs at the PacificCorp hydroelectric diversion near the Link River Dam.

Suckers have been observed in the Eastside Diversion Canal when it was shut down for maintenance (Fortune pers. comm.).

Hybridization and Genetics

A recent analysis of the population genetics of the Lost River sucker and shortnose suckers (Moyle and Berg 1991) suggested that "if populations continue to decline, these species may cross below the minimum viable population threshold and be lost." Low numbers and hybridization could threaten the genetic diversity and purity of the suckers. Intraspecific morphological variation among segregated populations has been thought to be a result of hybridization (e.g., Clear Lake shortnose suckers are morphologically and meristically different from Copco Lake or Upper Klamath Lake shortnose suckers). However, recent preliminary protein electrophoresis research suggests that significant hybridization has not occurred and that the wide range of overlapping morphological characters exhibited by Klamath Basin suckers may reflect differences in phenotypic expression as a response to differing physical environments, or the age of the individual (Moyle and Berg 1991). Two genetic studies have been done to date on Klamath Basin suckers, and while neither has been broad enough in scope to answer all questions, their data did not support the hypothesis that shortnose were introgressed with other sucker species. Moyle and Berg (1991) stated "...we are confident in asserting that the three shortnose sucker populations [Upper Klamath Lake, Copco Reservoir, and Clear Lake] tested in this study are 'pure'". Harris (1991) found no conclusive evidence of hybridization between sucker species, although his analyses were hampered by small sample sizes. More research is being conducted to help resolve hybridization and other genetic questions.

Introduced Fish

Introductions of non-native fishes have contributed to declines in populations of other sucker species in the Colorado River system and could be a factor in the upper Klamath Basin suckers decline. Species such as brown bullhead, fathead minnow, Sacramento perch, yellow perch, pumpkinseed, and green sunfish, bluegill, largemouth bass, and brown trout have become established and abundant in parts of the upper Klamath Basin. Predation or competition with small suckers by fathead minnows, yellow perch, and other introduced species is a possible cause for limited recruitment of suckers in Upper Klamath Lake and Copco Reservoir. However, relatively stable populations of suckers co-exist with abundant non-native species in parts of the Lost River system and native species such as tui chub, blue chub and rainbow trout are also very effective predators and potential competitors. Many of the introduced species have been in the upper Klamath Basin since the 1930's (Fortune pers. comm.) and declining sucker populations were not noticed until the 1960's. Golden (1969) noted a decrease in

the number of 'mullet' taken per angler from 1966 to 68. Also, Andreasen (1975) expressed deep concern for the status of these species before exotics like fathead minnows were established in the system. Influences of exotics need to be carefully assessed, but other factors are clearly involved (Klamath Tribe 1993).

Overharvest

A decline in the average size of suckers harvested in the snag fishery from 1966 to 1974 indicates that the fishery may have impacted the population. A fish kill in 1971 also may have contributed to the decline in average size. Exploitation estimates (percent of the population harvested by snagging) in 1984 and 1985 indicated less than a 6 percent angler exploitation rate for Lost River Suckers, which were the most exploited species due to their larger size (Bienz and Ziller 1987).

Chemical Contaminants

Chemical contaminants may have a role in the decline of the suckers. Large amounts of chemicals are applied in the watershed on an annual basis for agricultural uses, control of mosquitoes and other pests, forestry and forest fire control, and other uses. Many of these chemicals are sprayed from airplanes over wide areas and find their way into waterways directly or from surface and sub-surface flow. The reconnaissance investigation of water quality in the Klamath Basin by USGS, et al. in 1991 found that organochlorine pesticides are still detectable in bottom sediments at many locations due to past pesticide applications. Pesticides and other chemicals can have an acute toxicity that causes direct mortality of organisms, which has happened in the Klamath basin on several occasions. Chronic effects of pesticides include reducing the survival of organisms as well as widespread disruption of food chains that can affect aquatic habitats throughout the basin. USGS, et al. in 1991 also observed that there were very low numbers of benthic organisms in many locations, including Tule Lake, and an overall reduction in numbers of aquatic reptiles and amphibians, all of which may be due to the effects of pesticides. Potential for a major catastrophic spill exists with roads and railways crossing and running parallel with waterways in many areas of the upper Klamath Basin.

Habitat Reduction

Over 350,000 acres of natural wetlands probably existed in the Klamath Basin prior to 1900 (Adkins 1970). Since the Klamath Reclamation Project was passed in 1905, well over 100,000 acres of wetlands have been destroyed and reservoirs have inundated some of the former wetlands (USFWS 1989). Additionally, thousands of acres of wet meadows and shallow marsh have been and are continuing to be degraded or lost as a result of ditching, tiling and diking, and intensive livestock grazing (USFWS 1989).

Estimates of direct loss range from 75 to 90 percent (USFWS 1989). Approximately 35,000 acres of marshland around Upper Klamath and Agency Lakes have been lost this century. Between 1940 and 1955 approximately 12 miles of wetland shoreline habitat were lost between Modoc Point and the Narrows linking Upper Klamath and Agency Lakes, in addition to more than 3 miles in the lower Williamson River (Klamath Tribe 1993). Since 1955, approximately 3 miles of wetland shoreline habitat was lost on the west side of Agency Lake (Klamath Tribe 1993). Tule Lake was reduced from a historical 96,000 surface acres of open lake and marsh to only 13,000 acres of water available to the suckers. Lower Klamath Lake was eliminated as sucker habitat after 1924 when it was drained for farming (Moyle 1976), with the possible exception of the area referred to as Sheepy Lake. In addition to losses of lake habitats, an unknown number of miles of sucker spawning habitat in streams has been eliminated due to construction of dams with poor or no provisions for fish passage.

Degradation and Water Quality

Upper Klamath Lake was historically eutrophic (highly productive) but has become hypereutrophic (Goldman and Horne 1983). It has been hypothesized that the hypereutrophic condition of the lake is a result of 20th century marsh drainage and agricultural practices within its watershed (Miller and Tash 1967, Vincent 1968). Phinney *et al.* (1959) state that "except for *Microcystis*, the bloom algae (*Aphanizomenon*) do not flourish where humate content is high". They state that the reason for this effect is an inhibition of blue-green algae by the low pH water caused by high concentrations of humates (Phinney *et al.* 1959). They note that this same water can have a stimulatory effect at lower pH's, but that this serves as an explanation for the low productivity of the humic waters at the north end of the lake. Such waters may have been crucial for providing adequate rearing areas for larval and juvenile suckers entering the lake through the tributaries and dispersing out along the shoreline (Klamath Tribe 1993).

The following description of wetlands benefits is extracted from an EPA publication on wetlands (EPA 1988). In their natural condition, wetlands provide many benefits, including water quality improvement, flood protection, shoreline erosion control, natural products for human use, food, habitat and spawning grounds for fish, and opportunities for recreation and aesthetic appreciation. One of the most important values of wetlands is their ability to help maintain and improve the water quality of our nation's rivers, estuaries, and other water bodies. Wetlands do this by removing and retaining nutrients, processing chemical and organic wastes, and reducing sediment from flood waters. Wetlands function like natural tubs, storing either flood waters that overflow riverbanks or surface water that collects in isolated depressions. When wetlands absorb flood waters, they reduce damage downstream. Trees and other wetland vegetation help slow

the speed of flood waters. This action, combined with water storage, lowers flood heights and reduces the water's erosive potential. The stored water is then slowly released downstream as the flood peaks recede (EPA 1988). This EPA reference and the following statement, "Wetlands restoration at appropriate locations will likely be a desirable measure toward upper Klamath River Basin ecosystem restoration," are also in the Klamath Basin Water Users Protective Association's Initial Ecosystem Restoration Plan for the Upper Klamath River Basin.

Historical data suggests that man's increasing activity in the basin is causing longer, more intense periods of low water quality (Coleman et al. 1988). The hypereutrophic condition of Upper Klamath Lake impacts Tule Lake, lower portions of the Lost River, the Link River, Lake Ewauna, and the Klamath River downstream. Tule Lake is hypereutrophic and water quality is marginal for suckers during the summer months. In June and July of 1992, the pH in most of Tule Lake was frequently above 9.5 (Reclamation unpublished data). Most of the inflow during these months is irrigation return water that has been reused up to 6 times and is of poor quality for fish with high pH and low dissolved oxygen levels (USGS 1991). In 1970, Upper Klamath Lake's algal blooms were noted to be "seriously detrimental to the quality of water in Link and Klamath Rivers" (OSWRB 1971). In 1986, the majority of nutrients (79% of the nitrogen and 68% of the phosphorus) found in the Klamath River at Seiad Valley were determined to come from sources upstream of Iron Gate (CDWR 1986).

Other evidence indicates that while the Upper Klamath Lake has been historically eutrophic, man-caused changes have served to increase the level of nutrient export to the lake over background levels. Miller and Tash (1967) and USACE (1982) reported that, despite accounting for only 12.4% of the inflow, direct agricultural input from pumps and canals accounted for 31% of the phosphorus entering the lake. This figure includes only direct agricultural input, so the overall increase over background (historic) levels is likely substantially higher when considering non-point agricultural sources (Klamath Tribe 1993). This is especially true considering the large scale changes which have occurred throughout the watershed over the past 50 years. Such changes include grazing of more than 100,000 head of cattle upstream from the lake and conversion of riparian corridors and wetlands to cattle pasture and cropping areas (Klamath Tribe 1993). These practices have led to severe degradation of the Sprague and Wood River riparian areas and have therefore greatly increased the nutrient and sediment export potential (Karr and Schlosser 1978; Schlosser and Karr 1981; Lowrance et al. 1984; Peterjohn and Correll 1984; Gregory et al. 1991).

Disturbing marshlands aerates the soil, increases its pH, increases phosphate release from peat, and increases aerobic decomposition of nitrogen. Even in eutrophic systems increased

availability of nutrients will cause further changes in productivity and associated water quality parameters; this is what has happened in Upper Klamath Lake (Klamath Tribe 1993). It is important to note that because hypertrophic systems are disturbed and unstable (Barica 1980), they have the potential to deteriorate further.

Upper Klamath Lake nutrient inputs and cycling have been altered, and it has been hypothesized that, as a result, the algal community has shifted to more of a monoculture of the bluegreen algae *Aphanizomenon flos-aquae* which is more efficient than green algae at utilizing low concentrations of carbon dioxide. The massive blooms of algae that occur during the summer and autumn months are known to cause extremely high pH, wide fluctuations of dissolved oxygen and carbon dioxide levels, a green appearance and foul odors as the algae decay, and possibly an algal toxicity problem. When the algae crashes, the pH declines, but dissolved oxygen levels usually fall to very low levels (Kann per. comm.). At least minor fish kills due to water quality problems have occurred in parts of the basin since at least the 1960's. The most recent Upper Klamath Lake fish kill in 1986 is thought to have been caused by water quality problems associated with the algae, such as dissolved oxygen depletion due to high water temperatures, and extensive algal decay. Water quality in Upper Klamath Lake during these summer and fall months can quickly degrade to pH values in excess of 10.0 and dissolved oxygen concentrations near 0 mg/l (Scopettone 1986, Bienz and Ziller 1987, Kann pers. comm.). Dissolved oxygen depletion can occur on a regular diel basis through respiration, not only when blooms crash and decomposition occurs and conditions leading to dissolved oxygen depletion are not always localized, but can occur over large areas of the lake (Klamath Tribe 1993). Another point to consider is that too much dissolved oxygen may also be harmful to fish (e.g. Stewart et al. 1967), so the frequent occurrence of supersaturated dissolved oxygen conditions from high rates of productivity may be harmful. High ammonia levels are also a problem at times in most of the upper Klamath Basin and the more toxic unionized form is more prevalent at high pH levels (Kann pers. comm., Schwarzbach per. comm.). During the summer and early fall months, pH levels have been above 9.5 in most of Upper Klamath Lake on several occasions in recent years (Kann per. comm.) and in June of 1992, pH levels as high as 10.5 were measured in the water leaving the lake through the A-Canal (Schwarzbach pers. comm.). Falter and Cech (1991) found the maximum pH tolerance (permanent loss of equilibrium) found for juvenile shortnose suckers to be 9.55 and Castleberry and Cech (1990) found the minimum critical dissolved oxygen concentration (permanent loss of equilibrium) to be 0.7 mg/l. Preliminary toxicity research by the Service in 1992, observed mortalities of juvenile Lost River and shortnose suckers beginning at a pH of about 10 during a 96 hour test. The same preliminary research found mortalities in dissolved oxygen tests began at 3 to 4 mg/l,

and mortalities began to occur at 0.2 ppm in unionized ammonia nitrogen tests. The Service's tolerance results were from single variable tests that were not repeated and do not necessarily reflect actual tolerances in natural conditions where fish face combinations of stressful conditions, nor do they reflect long-term or sublethal conditions. Tule Lake, lower portions of the Lost River, Lake Ewauna, and the Klamath River above Keno Dam have similar water quality problems. In situ, survival of fathead minnow fry was very low with no more than 2 of 20 surviving during any of 4 separate tests at the same site in the Lost River just above Tule Lake during June of 1992 (Schwarzbach per. comm). Water quality conditions in the upper Klamath River are described as poor, high water temperature, low dissolved oxygen, high turbidity, high pH, and high levels of algae, bacteria, and suspended sediment (ODEQ 1988).

Upper Klamath Lake is now classified as hypertrophic (Goldman and Horne 1983) because of its mono-specific *Aphanizomenon* blooms of long duration and extremely high biomass, and the coincident extreme fluctuations in pH, CO₂, and dissolved oxygen. Given that lakes are not static systems (even under totally natural circumstances) it logically follows that Upper Klamath Lake has undergone trophic changes over the last 100 years. Bond et al. (1968) states "since 1913 there has been a change in the dominant species of plankton", and goes on to state that this thesis is supportable in that "the concentration of *Aphanizomenon* has increased greatly over the last 50 years, and it is also supported by conversations with older residents who recall conditions in the lake previous to about 1917". Hazel (1969) states that production was historically at a high level, but that "in the past several years complaints about odor, unsightly concentrations of algae, dead fish and birds, unpalatable fish and drinking water, etc., have increased in frequency, especially during the summer". Such changes in phytoplankton diversity and quantity are typical of lakes undergoing a change from eutrophic to hypertrophic conditions (diatom/green algae dominance to mixed blue-green algae assemblages to mono-cultures of blue-green algae [Goldman and Horne 1983; Wetzel 1985]).

Nutrient Loading

Many tributaries to Upper Klamath Lake are known to have serious nonpoint source pollution problems, including high turbidity, low dissolved oxygen, excessive nutrients, pesticides, sediment, and excessive plant growths (ODEQ 1988). Studies by Sanville et al. (1974) showed concentrations of nitrogen and phosphorus in the interstitial water of Howard Bay sediment were several times higher than those near Buck Island and the lake outlet. These high concentrations of nitrogen and phosphorus in the interstitial water of Howard Bay was believed to be the result of agricultural drainage from nearby ranches. A sediment core taken near the outlet of the lake indicated an accelerated rate of sedimentation

in more recent years, possibly related to changes in the watershed and productivity of the lake (Sanville et al. 1974). Miller and Tash (1967) stated "the quantity of nitrogen and phosphorus in only the upper inch of lake sediments is as great as that quantity which would flow into the lake during the next 60 years if the present rate of inflow continues." However, the availability of sediment nutrients is unknown. Wildung and Schmidt (1973) concluded that generally 12 percent of total sediment phosphorus was subject to release, not including interstitial phosphorus.

Available nutrients may not be unlimited in Upper Klamath Lake. Dissolved inorganic nitrogen usually was depleted below the detection level when algal production was high, suggesting that nitrogen could be a limiting nutrient for algal production (USACE 1982). Even though background phosphorus concentrations are relatively high and are likely to support high algal growth, evidence exists to support the fact that phosphorus does become limiting in the system. For example, annual depletions of soluble reactive phosphorus occur during periods of intense algal growth over the growing season, and generally coincide with bloom crashes (Klamath Tribe 1993). Maloney et al. (1972) and Miller et al. (1974) showed stimulation of algal growth after addition of phosphorus to water from Upper Klamath Lake collected in October and July. The July sample showed stimulation of algal growth with phosphorus addition despite total phosphorus being 330 ug/L, and ortho phosphorus being 50 ug/l (Miller et al. 1974). It is very likely that increased input of nutrients may substantially increase the intensity and duration of algae growth (Klamath Tribe 1993). Water quality data gathered during the summer of 1992 provided potential evidence that reductions in external nutrient loading can alter abundance and composition of the algal community in Upper Klamath Lake. Due to severe drought conditions, Upper Klamath Lake received record low inflows which likely reduced external nutrient loading. An algae bloom of *Aphanizomenon flos-aquae* developed earlier than usual and created water quality problems in May and June, but then crashed and did not re-develop on a lake-wide basis. The algae bloom normally would crash about a month later, then quickly recover and maintain a dense bloom until colder weather in October or November caused a decline (Kann pers. comm.). Other types of algae did increase after the *Aphanizomenon flos-aquae* crash, but did not cause the water quality problems that are normal for Upper Klamath Lake in the late summer and early fall (Kann pers. comm.). If nutrients from sediments were available and unlimited, the *Aphanizomenon flos-aquae* bloom should have recovered. What was limiting the algae is unknown, but it is likely that the availability of essential nutrients was inadequate. If nutrient loading and algal populations can be controlled, water quality should be improved greatly in Upper Klamath Lake and the Klamath River system. Algal blooms are still likely to occur given high background concentrations of nutrients, and a total change in trophic state is unlikely; however, more subtle changes in duration and

intensity of blooms, and in such water quality parameters as pH and dissolved oxygen are entirely possible. Data shows that reduced algal biomass decreases the probability of attaining elevated pH in Upper Klamath Lake, even when the reduced biomass still falls within the hypertrophic range (Kann and Smith 1993).

Below Upper Klamath Lake, other sources of nutrients and contaminants contribute to the problem. Another result of consumptive water use in the lower Lost River and upper Klamath River is an increased concentration of salts in surface water (NCRWQCB 1989). During the 1960s, coliform levels were extremely high immediately downstream of Lake Ewauna, which reflected waste discharges from sewage treatment facilities and industries at that time (OSWRB 1971). Sewage effluent from the Klamath Falls area was noted as a water quality problem in the 1960's and early 1970's (Fortune et al. 1966, OSWRB 1971). Nutrients and contaminants from an increasing number of housing developments near the Williamson and Sprague Rivers or other areas above Upper Klamath Lake could also be contributing to water quality problems. In the Klamath River at the Highway 97 bridge, coliform counts (bacteria levels indicative of human or animal wastes) were 20 times above acceptable limits for public health and recreational purposes. However, the outflow from Upper Klamath Lake in the Link River about 5.5 miles upstream was well below the standard (OSWRB 1971). Improvements in waste treatment and better regulation of waste discharge as a result of the 1972 Clean Water Act now have reduced coliform levels to acceptable levels. Still, problem levels of pesticides and metals have been detected in the lake (USGS 1991).

Discharges of poor quality water from agricultural operations in the Klamath Project via the Klamath Straits are noted by the Oregon and California state water quality agencies as a problem (NCRWQCB 1989; ODEQ 1988). Dissolved oxygen levels as low as 0.0 mg/l, temperatures up to 31.27 °C, and pH levels as high as 10.08 were measured in the Klamath Straits Drain in 1992 with at least 96 hour periods when the pH did not go below 9.4 (Schwarzbach pers. comm.). Total ammonia levels as high as 0.94 mg/l have been measured in the Klamath Straits Drain and survival of fathead minnow fry was 0/20 in 2 of 4 days of testing at 2 different sites in the drain during June of 1992 (Schwarzbach per. comm.).

Grazing

Overgrazing in the riparian areas of streams, especially in the Sprague River system, has left no stream structure for fish habitat and has exposed the stream to solar radiation (USFS 1989). Grazing practices have led to severe degradation of the riparian areas and have therefore greatly increased the nutrient and sediment export potential (Karr and Schlosser 1978; Schlosser and Karr 1981; Lowrance et al. 1984; Peterjohn and Correll 1984; Gregory et al. 1991). On Fishhole Creek, for example, a century

of season-long use by cattle has destroyed the stabilizing streambank vegetation, resulting in erosion and lowered water tables (Todd 1989). Similar conditions exist in the Wood River Valley. The resulting conditions have left marginal habitat in the Sprague River for spawning populations of trout and suckers, increased stream temperatures for miles downstream, and contributed sediment and nutrients to the stream system. As a result, the Sprague River was identified by the Oregon Dept. of Environmental Quality as one of the highest priority streams in the state for control of nonpoint source pollution (ODEQ 1989). In addition to the Sprague River system, grazing problems have been noted for the Williamson River, Sevenmile Creek, Spencer Creek and Shovel Creek (ODEQ 1989, USBLM 1990b and 1990c). The Water Users Plan suggests that significant opportunities exist to improve riparian habitat in the Clear Lake/Lost River/Gerber Reservoir drainage, as well as on tributaries of Upper Klamath Lake and Agency Lake. Efforts to improve riparian habitat should also be expanded to watersheds of tributary streams that have been degraded in the Klamath River system below Upper Klamath Lake, such as efforts already initiated on Spencer Creek and Shovel Creek (Maria pers. comm.).

Forestry

Forestry practices also contributed to water quality problems in the basin. In 1970, the Oregon State Water Resources Board noted that "serious erosion and sedimentation problems have been caused by logging and road building practices that have not provided for soil stabilization" in the upper Klamath Basin. By eliminating vegetative cover from much of the volcanic ash and pumice type soils, these sites became highly susceptible to erosion. The soils carry salts and nutrients, especially phosphorous, to surface waters, where they dissolve and "accelerate the eutrophication process in streams and lakes." Sedimentation of fish habitat also was noted as an impact (OSWRB 1971). Log storage on the Klamath River below Klamath Falls was greatly reduced after fish kills in the late 1960s, but sections of the river above US 97 are still used for log storage today. In the late 1980s, many changes began to occur in forest practices on both private and public land in Oregon. The 1987 amendment to the Oregon Forest Practices Act led to an apparent improvement over the previous practices, especially regarding riparian protection.

Water Quality Summary

The overall picture appears to be one of an unbalanced ecosystem which has become dominated by an algal monoculture only within the past 75 years. In 1913, the Upper Klamath Lake was found to be eutrophic but was characterized by mixed blue-green and diatom communities (Kemmerer *et al.* 1923). By the 1930's, *A. flos-aquae* was present and abundant but not yet dominant (Phinney *et al.*

1959). Since at least the 1950's, however, this one species has dominated the massive algal blooms. Bond et al. (1968) reported mean *A. flos-aquae* counts from Phinney and Peak (1961) to be nearly 10,000 times those of the maximum count reported by Bonnell and Mote (1942). Its die-offs and high production are the cause of the drastic fluctuations in dissolved oxygen and pH observed throughout the lake (Kann 1989; Coleman et al. 1988) and similar problems exist downstream. The water quality problems have limited the availability and quality of habitat for suckers and other fish and caused major fish kills in the basin. It is the Service's opinion that water quality must be improved to provide stable habitat for the recovery of the suckers and other fish and wildlife in the upper Klamath Basin.

Other Factors

Additionally, a multi-year drought throughout the basin has reduced the quantity and quality of sucker habitats, although in most cases water diversions have contributed to this reduction. For example, Clear Lake was recently described as supporting the largest and healthiest population of shortnose suckers. In 1992, only the western lobe of the lake held water and spawning runs were not observed in 1991 or 1992 (Scopettone pers. comm.). Suckers in Gerber Reservoir were also in a greatly reduced body of water in 1991 and 1992 and were exhibiting signs of stress (Buettner pers. comm.).

H. Conservation Efforts

Recovery Efforts to Improve Habitat and Water Quality

Potential eutrophication control measures have been investigated using numerous lake restoration or management techniques (USACE 1982). Short term or smaller scale techniques, such as chemical treatment of algae, would not be effective or economical for the upper Klamath Basin. Improvements in land management, including changes in agricultural practices, riparian and wetland restoration, improved forestry practices, range management, and erosion control are all proven methods of improving water quality in a watershed. However, the principal debate focuses on whether the lake's quality can be improved in any cost-effective way from the current hypereutrophic condition to a condition where the duration and intensity of the underlying *Aphanizomenon* blooms can be reduced (Kann 1989; Bortleson and Fretwell 1990). The lake may still be hypereutrophic but decreased duration and intensity of blooms will have beneficial effects for water quality and fish species.

Independent actions, such as fencing and planting vegetation along portions of tributary streams like the Wood and Sprague Rivers, already have been initiated by local landowners and private organizations. Wetlands are being restored on private lands in

the basin through the Service's Partners for Wildlife program. These lands are primarily managed as duck clubs and provide a source of income for owners and managers. Other sources of funding also are available for restoring wetlands and new sources should be investigated. The term "wetlands" includes seasonal wetlands, like wet meadows, as well as marshes. Improving watershed conditions and reducing nutrient loading by changing land management to wet meadows for hay production, or improving grazing practices to restore riparian areas and range conditions, are examples of recovery actions that would be relatively inexpensive to implement and provide a beneficial use for landowners. Efforts like this should be encouraged with assistance in planning and funding to make them economically feasible.

Many of the tasks for water quality improvements in this recovery plan are very similar to actions recommended in the Draft Upper Klamath River Basin Amendment to the Long-Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program, prepared for the Klamath River Basin Fisheries Task Force for restoration of salmonids. Much of the wetland restoration in this recovery plan is recommended in the North American Waterfowl Plan. Many similar recovery tasks also are recommended in the Klamath Basin Water Users Protective Association's Initial Ecosystem Restoration Plan for the Upper Klamath River Basin (Water Users Plan).

Agency Actions

Current conservation efforts for the Klamath suckers have focused on the need to re-establish a more naturally functioning Klamath ecosystem. Among the research efforts are projects designed and coordinated through a series of research coordination meetings, where researchers from all involved agencies present results and research plans to allow for coordination and to prevent duplication of effort. This will provide data to help quantify many of the complex interactions in the Klamath ecosystem. Specific projects include: Wetland Nutrient Processing studies (Reclamation, Denver Office), Hydrology of Shallow Groundwater for the Upper Klamath/Agency Lake Basin (USGS Portland, Tribe), External Nutrient Inflows to Upper Klamath lake (USGS Portland), Assessing Contaminant Load in Irrigation Drainwater (USGS, Reclamation, USFWS, Sacramento Field Office), Genetic Surveys of Sucker Populations (CDFG), and Modeling Nutrient Flux and Water Quality and Their Effects on Sucker Habitat (Tribe). All federal agency actions and other projects involving federal funding, require compliance with the National Environmental Policy Act and other appropriate legislation before implementation.

Oregon has a Statewide Water Quality Management Plan, as required by section 208 of the Federal Clean Water Act. A Memorandum of Understanding (MOU) between the Oregon Dept. of Environmental

Quality (ODEQ) and the U.S. Forest Service includes recommended water quality protection by the Pacific Northwest Region, as identified in "General Water Quality Best Management Practices" (USFS 1988). For private lands, DEQ and the U.S. Environmental Protection Agency (EPA) annually certified the Oregon Forest Practices Act as Best Management Practices (BMPs) between 1978 and 1985. However, no significant water quality data is available to assess the effectiveness of the practices. The DEQ concluded that Forest Service practices meet or exceed State forest practice requirements (R. Wood, ODEQ, pers. comm.).

The Forest Service recently has conducted fish surveys on some of the potential sucker spawning tributaries on Forest Service lands and hired fisheries biologists in the Modoc, Fremont, and Winema National Forests. The Forest Service also is helping to fund sucker research efforts. The Fremont and Winema National Forests adopted their Land and Resource Management Plans, which address riparian protection and restoration, watershed management, and erosion prevention and control. The Modoc National Forest has a similar management plan. For example, the Winema National Forest has specific standards relating to prevention of temperature increases in Class I and II streams, limiting the increase in stream turbidities, and contribution of Class III and IV streams to downstream water quality. In addition, the timing of road building and timber harvest shall be scheduled to minimize long-term detrimental changes in watershed conditions as a principle means to avoid unacceptable cumulative impacts.

The Clear Lake watershed occurs primarily within the boundaries of the Fremont and Modoc National Forests. The Gerber Reservoir watershed is located primarily on lands administered by the U.S. Bureau of Land Management (BLM) and the Fremont National Forest. The Forest Service and BLM have initiated fencing projects on some Gerber Reservoir tributaries to restore the riparian areas. The Modoc National Forest has initiated fencing projects on some tributaries in these watersheds to restore riparian habitat.

BLM is in the process of developing its Resource Management Plan but is already acknowledging habitat protection for the upper Klamath River canyon. Current BLM management direction to mitigate timber harvesting impacts on water quality include: no or restricted timber harvest within the riparian zone of streams (restrictions vary with stream class); special logging practices, where appropriate; and road construction to state-of-the-art standards. In addition, BLM has closed and rehabilitated unsurfaced roads and seeded, mulched, and fertilized road cutbanks, fill slopes, and landings (USBLM 1990b). For the Klamath River Canyon area, BLM's current management direction is to allow no new roads and to perform minimal forest management activities, with recreational, scenic, and wildlife values to be emphasized. (Pacific Power and Light's management of its forestland in the canyon is reportedly similar) (USBLM 1990a). BLM

has designated the Gerber watershed as a state Riparian Demonstration Area and has implemented multiple use management strategies to restore, maintain, and improve riparian areas. BLM is also pursuing acquisition of the 3,000 acre Wood River Ranch with the objective of restoring marsh habitat on the property.

The Oregon Department of Fish and Wildlife (ODFW) closed the snag fishery in 1987. Section 6 funds provided under the Endangered Species Act to ODFW have funded research projects into the biology of the suckers since 1987. Research since 1991 has been conducted by Dr. Douglas Markle of Oregon State University, Corvallis. This research has focused on understanding important features of the juvenile ecology of the suckers, including estimating year class strength of juvenile suckers (Markle 1992). Markle's research also seeks to improve identification of species in their larval and juvenile life stages. Reclamation also began contracting Dr. Markle's group from OSU in 1990. The first project sought to quantify sucker entrainment into the "A" Canal of the Klamath Project.

The CDFG has funded several stream restoration projects on Shovel Creek. Banks were stabilized with riprap and planted with willows, and check dams were constructed. Riparian areas were fenced on Klamath National Forest lands and the lower mile of Shovel Creek, owned by PacifiCorp. The resident trout population in Shovel Creek has increased as much as ten fold in some reaches, however this increase may not be representative of the creek's entire population trend. The population is expected to increase dramatically in the upper Shovel Creek meadow area because of stream enhancement efforts (Maria pers. comm.).

The Service's, National Fisheries Research, Seattle Research Station, Reno Office (NFRSR) has conducted research on suckers in the upper Klamath Basin since 1986. At first in Upper Klamath Lake with funding from the Tribe and the ODFW, and more recently in the California portion of the basin with funding from the California Department of Fish and Game (Buettner pers. comm.). These projects have focused on the distribution, life history, habitat requirements, and status of the Lost River and shortnose suckers. The CDFG is contracting Dr. Don Buth of the University of California, Los Angeles, for genetic studies of Lost River, shortnose, and other suckers in the basin in 1993. Approximately 124 shortnose suckers salvaged from Clear Lake are being held by CDFG at a hatchery site to provide a source of suckers for reintroduction if needed.

The U.S. Fish and Wildlife Service plans to open a new inter-agency office in Klamath Falls, Oregon to coordinate ecosystem recovery efforts in the upper Klamath Basin. This office will coordinate research and recovery actions of all agencies in the upper Klamath Basin. Researchers will be encouraged to publish the results of research done in coordination with recovery efforts

and make results more available to the public. This office also will work with other agencies to establish information and education programs to inform the public about endangered and threatened species and recovery efforts in the basin.

Beginning in 1991, Reclamation also conducted salvages of suckers from the canals of the Klamath Project at the end of the irrigation season. In 1991, Reclamation began studying various aspects of the suckers' biology and habitat needs, with a focus on refugial habitats, water quality needs and tolerances, status and distribution, drought related salvage and water quality monitoring. Salvaged suckers from the irrigation systems have been returned to more permanent waters, and a small number of suckers from Clear Lake were sent to the Service's Dexter National Fish Hatchery, in Dexter, New Mexico. As of December 1992, 25 shortnose suckers and 16 Lost River suckers were being held at the Dexter hatchery. Reclamation will be carrying out many more studies and habitat restoration projects under the terms of the Service's July 22, 1992, biological opinion for long term operations of the Klamath Project. Most of the sucker populations are within Reclamation's Klamath Project area and the Service's biological opinion suggests or requires some of the same actions recommended in this recovery plan. The long-term biological opinion also sets minimum lake levels and other restrictions on Klamath Project operations that are not addressed in this plan. This recovery plan incorporates information from, but does not supersede, the long-term biological opinion. The scope of this recovery plan goes beyond effects of the Klamath Project and addresses effects of resource management in the upper Klamath Basin as part of an ecosystem recovery effort. Implementation of this recovery plan also should benefit game fish in the watershed, trout and salmon downstream, amphibians, reptiles, waterfowl and other wildlife.

Other Actions

The Klamath Tribe (Tribe) began monitoring the Upper Klamath Lake populations of suckers in 1983, with the goal of establishing the species' status and generating biological information to support the listing. The Tribe then passed a resolution prohibiting the take of Upper Klamath Lake suckers. Spawning gravel was added to Sucker Springs in 1987, 1991, and 1992 to expand the usable spawning habitat in these areas. Gravel placements have all been cooperative efforts involving the Tribe, USFWS, Reclamation, and/or ODFW. Large numbers of Lost River suckers were observed using the improved area in 1987, and some spawning activity was recorded in February 1992 (Buettner pers. comm.). In 1988, the Tribe began work on the hatchery facility on the Sprague River. This facility was built with the intent of raising fish for research and developing culture techniques. The Tribe currently is pushing for the development of a genetic management plan, and

the potential hatchery supplementation of certain reduced stocks such as the Sucker Spring stock (Dunsmoor pers. comm.).

The City of Klamath Falls contracted Beak Consultants Inc. to study sucker populations in Copco Reservoir and the Klamath River in 1987 to assess potential impacts of the proposed Salt Caves hydroelectric project. Sewage treatment was upgraded to improve water quality. The City of Klamath Falls currently treats its sewage at a facility providing secondary level of treatment using activated sludge and discharges its treated effluent into Lake Ewauna. Storm water drains are separate from sewage lines and do not contribute to sewage inflow to the plant. Although the treatment plant's current capacity is 6.0 million gallons per day (mgd), a facility study is being performed to evaluate changes in its operations and size (City of Klamath Falls Public Works Dept., verbal communication). Waste discharge standards could be increased for the City's plant as a result of a requirement of the federal Water Quality Act of 1987.

The South Suburban Sanitary District (SSSD) sewage treatment facility also discharges into Lake Ewauna. Sewage is treated in a series of four lagoons containing activated sludge, aerated, chlorinated, and then passed through a marsh before release into the lake. Effluent standards for this facility are 30 mg/l Biological Oxygen Demand (an indicator of nutrient loading) and 85 mg/l of suspended solids, and 200 coliform/l. Dissolved oxygen concentration ranges from 2.0 mg/l to 5.0 mg/l in the summer months, and rises above 10.0 mg/l in winter months. ODEQ is refining these standards as a part of its permit issuance process, and may require the SSSD to develop an additional wetlands marsh on an adjacent 120 acre parcel (R. Rivenes, SSSD, personal communication).

Independent actions such as fencing and planting vegetation along portions of tributary streams (e.g., Wood and Sprague Rivers) already have been initiated by local landowners and private organizations. Wetlands are being restored on private lands in the basin through the Service's Partners for Wildlife program. Efforts like this should be encouraged with more assistance in planning and funding.

Some successful pilot projects have been taken to restore fish habitat in the Upper Basin. Fish passage continues to be improved by increment, and riparian restoration is showing strong potential as a tool to reverse water quality problems in Upper Klamath Lake. The treated reach of the Williamson River (above the Williamson Marsh) was wide and shallow due to overgrazing and erosion. Trees were felled, pulled into the stream, and secured by anchoring with cabled rocks. Silt began to be deposited at the edge of the stream and eventually stream width was reduced by half. The narrower channel substantially increased in depth. Funding for this Cooperative Resource Management Plan (CRMP) effort on private

and public land came partially from the Oregon Governor's Watershed Enhancement Board (GWEB) program. Riparian planting has also been done on several miles of the upper Williamson (Dunsmoor pers. comm.).

Another successful CRMP project benefitting from GWEB funds has been initiated on Spencer Creek, an important spawning tributary above J.C. Boyle Dam (USBLM 1990c). Before treatment with fencing and bank stabilization with woody material, Spencer Creek warmed up 0.5 C per mile on USFS lands. Recovery has been dramatic (Fraser pers. comm.).

Part of Fishhole Creek, a tributary of the Sprague, was rehabilitated economically by using temporary electric fences along with rock check weirs, flood control spills, and bank stabilization plantings. As permanent fencing was determined to be an unacceptably expensive way to control livestock, the temporary electric fences proved to offer excellent cattle control and became the key to better livestock management on an adjacent meadow. Less than \$400 was spent on the fencing materials in comparison to \$2,000 for conventional fencing. Revegetation was also seen to be the long term key to restoration of excessively drained meadows. Partial funding came from the Agricultural Conservation Program of the U.S. Agricultural Stabilization and Conservation Service (ASCS) while the design was developed with assistance from the Soil Conservation Service (SCS) (Todd 1989).

The Klamath Basin Water Users Protective Association (Association) has prepared an Initial Ecosystem Restoration Plan for the Upper Klamath River Basin. The plan provides a summary of information and outlines the Association's recommendations for recovery of the suckers and the ecosystem. A number of those recommendations are incorporated into this recovery plan. They also funded biologists and technicians to work with Reclamation in collecting data on the suckers' biology and habitat needs, including information on larval migration and surveys of springs in Upper Klamath Lake.

Information for reporting dead, injured, or sick endangered suckers:

Upon locating a dead, injured, or sick endangered or threatened species specimen, initial notification must be made to the nearest Service Law Enforcement Office. In Oregon, contact the U.S. Fish and Wildlife Service, Division of Law Enforcement, District 1, P.O. Box 1910, Klamath Falls, Oregon 97601 (503/883-6900). In California, contact the U.S. Fish and Wildlife Service, Division of Law Enforcement, District 1, 2800 Cottage Way, Room E-1924, Sacramento, California 95825 (916/978-4861). Care should be taken in handling sick or injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or

injured endangered species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

The Service should be notified of the finding of any endangered or threatened species found dead or injured in the upper Klamath Basin. Notification should include the date, time, and precise location of the injured animal or carcass, and any other pertinent information. In Oregon, the Service contact person for this information is Mr. Russell D. Peterson (503/231-6179 and in California, the contact person is Mr. Wayne White (916/978-4613. Any Lost River suckers or shortnose suckers found dead or injured in California shall be turned into the CDFG. The agency contact is Ms. Susan Ellis (916/355-7097).

January 13, 1995

WATER
RESOURCES
DEPARTMENT

~~CIRCLE FIVE RANCH INC.
45850 GERBER RD
BONANZA OR 97623~~

*Sent to all
applicants*

Reference: File number(s) 12493 & 12494

Dear Bonanza Area Groundwater Applicant:

Enclosed is a list of applications filed for use of groundwater in the Lost River Basin. Technical reviews have been issued for each of these applications. Objections have been filed in opposition to each of the technical reviews. Department staff met with the applicants on August 15, 1994. In addition, Department staff participated in the Health Division "Bonanza Summit" on November 1, 1994.

As we stated at the August 15, 1994, meeting we have determined that the objections filed by the Bureau of Reclamation, Oregon Department of Fish and Wildlife and WaterWatch of Oregon raise valid public interest issues. (Copies of these objection letters are enclosed.) Department rules allow for voluntary alternative dispute resolution (ADR) to resolve public interest issues if possible. The dispute resolution discussions are specifically intended to address these public interest issues. The purpose of the August 15 meeting was to initiate the ADR discussions.

However, at the August 15 meeting a number of individuals indicated that they felt they could prove that use of water from their wells located within the study area described in the "Groundwater Open File Report" (Gorman Report # 94-01) would not have the potential for interference with the surface water of the Lost River. Department staff encouraged individuals to submit any additional information they had or could develop concerning the interference question. At the request of a number of applicants, we transmitted a letter on October 4, 1994, outlining the examples of the type of information that would be of value to either confirm the Gorman Report or modify its conclusions. In our October 4 letter we agreed to put the ADR discussions on hold pending receipt of additional groundwater information.



Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

January 13, 1995

Page Two

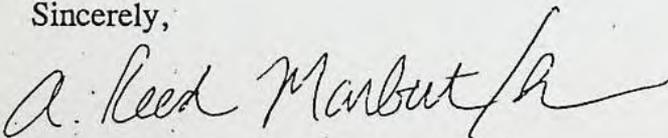
At the November 1 Bonanza Summit we met with a number of applicants, representatives of the City of Bonanza, Bureau of Reclamation staff, Health Division staff and other interested parties to understand how all parties could participate in discussions concerning the impact of development of the pending groundwater applications. A number of individuals indicated that it would take a few months for the parties to develop options for solutions to the City of Bonanza water quality problems. However, to date we have not received any additional groundwater information, nor have we received details as to the status of the Bonanza Summit discussions.

We are aware of the potential for great expense associated with gathering and analyzing additional data relative to the groundwater/surface water connection. Nevertheless, we do not feel we can further delay our ADR discussions. We would like to schedule the first discussion for 7:00 p.m., February 7, 1995, at the Oregon State Extension Service Building, 3328 Vandenberg RD, in Klamath Falls.

We are required to address all public interest issues raised by the objectors and would like to resolve as many as possible by way of the ADR process. However, if you elect not to participate in the ADR discussions we propose to schedule a contested case proceeding to address the issues set out in the objections. Therefore, if you do not wish to participate in the ADR discussions, please send me a written statement to that effect before the February 7, 1995 meeting. Be sure to include your file number on any correspondence.

If you elect to participate in the ADR discussions please attend the February 7, 1995 meeting. If you have questions please call Dwight French at (503) 378-8455, Ext. 268 or Bob Main at 388-6669.

Sincerely,



A. Reed Marbut, Administrator
Water Rights/Adjudication Division

ARM/dpc

Enclosures

cc: Martha O. Pagel
Bob Main
Dwight French
Fred Lissner
Steve Sanders

PROPOSED PERMIT CONDITIONS

Application: ~~XXXXXX~~

The following conditions will apply to water use under the permit, and will appear in the permit.

1. Period of allowed use: March 1 through September 30 of each year.
2. Rate (cfs or gpm) and/or Volume (acre/feet or gallons) of use: ~~XXXXXX~~
3. Water use development requirements:
 - A. Begin construction by (one year from issuance of permit).
 - B. Complete construction by October 1, 1996.
 - C. Completely apply the water to beneficial use by October 1, 1997.
4. The use of water under this permit will expire (five years from the issuance of the permit). The permit may be extended if the Director finds that:
 - A. Surface water flows are not significantly diminished;
 - B. Within two years of permit issuance, the permittee has submitted a plan to the Commission indicating potential sources for an alternative long-term water supply;
 - C. Periodic water level reports have been timely submitted; and
 - D. Excessively declining water levels have not occurred.
5. The amount of water used for irrigation under this right, together with the amount secured under any other right existing for the same lands, is limited to a diversion of ONE-EIGHTIETH of one cubic foot per second (or its equivalent) and 2.5 acre-feet for each acre irrigated during the irrigation season of each year.
6. Measurement, recording and reporting conditions:
 - A. The Director may require the permittee to report general water use information, including the periods of water use and the place and nature of use of water under the permit.
 - B. 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
 - C. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

- D. The Director may require the permittee to keep and maintain a record of the amount (volume) of water used and may require the permittee to report water use on a periodic schedule as established by the Director.
7. The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.
 8. The permittee/appropriator shall install a meter or other suitable measuring device approved by the Director and submit an annual report of water used under this permit to the Department by April 15 of each year.
 9. A static water level measurement shall be made and submitted before any use of water may commence from the well.
 10. The permittee shall obtain a static water-level measurement for each well during March and September of each year and report the measurements to the Department. The measurement shall be made by a certified water rights examiner, registered geologist, licensed land surveyor or registered professional engineer. Water levels shall be reported as depth-to-water below ground level in feet and inches or to one-hundredth of a foot and shall be accompanied by supporting calculations. The water user shall report the static water level(s) in the well(s) to the Groundwater/Hydrology Section of the Water Resources Department by April 15 and October 15, respectively, of each year.
 11. If substantial interference with a senior surface or ground water right occurs due to withdrawal of water from the well(s) listed on this permit, then use of water from such well(s) shall be discontinued or reduced or the schedule of withdrawal shall be regulated until the Department approves or implements an alternative administrative action to mitigate such interference.
 12. Failure to comply with any of the provisions of the permit may result in action including, but not limited to, restrictions on the use, penalties, or cancellation of the permit.
 13. The 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.
 14. The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.
 15. This right is limited to any deficiency in the available supply of any prior right existing for the same land.

newly proposed

PROPOSED PERMIT CONDITIONS

Water use under the permits shall be conditioned as follows:

1. Period of allowed use: April 15 through October 15 of each year.
2. (SPECIFIC TO EACH APPLICATION) Rate (cfs or gpm) and/or Volume acre/feet or gallons) of use:
3. (SPECIFIC TO EACH APPLICATION) The use of water is limited to supplemental irrigation.
4. Water use development requirements:
 - A. Begin construction by (one year from issuance of permit).
 - B. Complete construction by October 1, 1997.
 - C. Completely apply the water to beneficial use, by five years from date of issuance of permit.
5. The use of water under this permit may expire or be extended five years from the date of issuance of the permit. Alternatively, a water right certificate shall be issued at the end of the five year period if the Director finds:
 - A. River stage or Bonanza Big Spring flows are not significantly diminished by use of water under this permit as determined by the Oregon Water Resources Department, in consultation with the Bureau of Reclamation and Oregon Department of Fish and Wildlife, using quantifiable groundwater and hydrologic science that stands up to peer review;
 - B. Within two years of permit issuance for primary use, the permittee/appropriator has submitted a plan to the Commission indicating potential economical sources for an alternative long term water supply;
 - C. Periodic water level reports have been submitted; and
 - D. Excessively declining ground water levels have not occurred due to well use as determined by the Oregon Water Resources Department, in consultation with the Bureau of Reclamation and Oregon Department of Fish and Wildlife, using quantifiable groundwater and hydrologic science that stands up to peer review.
6. The amount of water used for irrigation under this right, together with the amount used under any other right existing for the same land, is limited to a diversion of ONE-

EIGHTIETH of one cubic foot per second (or its equivalent) and 2.5 acre-feet for each acre irrigated during the irrigation season of each year.

7. Measurement, recording and reporting conditions:
 - A. Before water use may begin under this permit, the permittee/appropriator 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 by April 15, 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/appropriator shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located on private property, the watermaster shall request access upon reasonable notice.
8. The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and a pressure gauge adequate to determine water level elevation in the well at all times.
9. A static water level measurement shall be made and submitted before any use of water may commence from the well.
10. The permittee/appropriator shall obtain a static water-level measurement for each well during March and October of each year and report the measurements to the Department. The measurement shall be made by a certified water-rights examiner, registered professional geologist, certified engineering geologist, professional engineer, licensed well constructor or pump installer licensed by the Construction Contractors Board or by the permittee/appropriator under the direction of the local watermaster. Water levels shall be reported as depth-to-water below ground in feet and inches or to one-hundredth of a foot and shall be accompanied by supporting calculations. The permittee/appropriator shall report the static water level(s) in the well(s) to the Groundwater/Hydrology Section of the Water Resources Department by April 15 and November 15, respectively, of each year.

Proposed Permit Conditions
Page Three

11. If substantial interference with a senior surface or ground water right occurs due to withdrawal of water from the well(s) listed on this permit, then use of water from such well(s) shall be discontinued or reduced or the schedule of withdrawal shall be regulated until the Department approves or implements an alternative administrative action to mitigate such interference.
12. Failure to comply with any of the provisions of the permit may result in action including, but not limited to, restrictions on the use, penalties, or cancellation of the permit.
13. The permit is for the beneficial use of water without waste.
14. The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.
15. This right is limited to any deficiency in the available supply of any prior right existing for the same land.

MEMORANDUM

TO: Water Resources Commission

FROM: Director *ms*

SUBJECT: Agenda Item 3, June 2, 1994
Water Resources Commission Meeting

WATER
RESOURCES
DEPARTMENT

Status Report: Groundwater Conditions and Water Use Application
Processing in the Bonanza Area, Klamath County

I. Issue Statement

Department staff, the U.S. Bureau of Reclamation (BOR), Oregon Department of Fish and Wildlife (ODFW), WaterWatch of Oregon and residents in and around the agricultural community of Bonanza are currently struggling with how further development of the area's water resources should proceed. Area farmers have applied for groundwater rights and have invested large sums of money anticipating being able to use the resource. Residents of the town have expressed concerns for groundwater quality deterioration as groundwater levels decline in response to pumping. Some holders of prior rights to surface water perceive injury if groundwater is allowed to be further developed. The BOR, ODFW and WaterWatch are concerned for various instream values if groundwater use is allowed to increase.

II. Background

In the winter and spring of 1992 staff conducted a preliminary review of the Bonanza area geology and hydrology to evaluate the possible connection of ground and surface water. As a result, on June 5, 1992, the Department recommended that the Commission authorize staff to begin proceedings to withdraw the local groundwater resources from further appropriation until staff could complete a more thorough investigation. Some residents objected, indicating that area surface water users had not been disadvantaged by groundwater pumping. In addition, they did not think additional groundwater development would deplete surface water supplies.

 In response, the Commission opted not to begin withdrawal proceedings but directed staff to further study the area groundwater resource. At that point, staff continued to process applications in accordance with rules and procedures already in place. Technical reviews have now been completed for the Bonanza area groundwater applications. The Department has received objections to all of the technical reviews. Processing of the objections has been delayed pending completion of a groundwater study.



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The study, which began in August 1992, examined the local groundwater system and its relationship to surface waters in Lost River and its tributaries. The study is now complete and will be essential to the Department in resolving the objections. On April 12, staff met with area residents to discuss the study report and will soon meet with the affected parties to try to resolve the objections through an alternative dispute resolution (ADR) process.

III. Discussion

A. Water Quality Problems:

The community of Bonanza is dependent on groundwater for drinking water supplies. There is no community water system. Residences, several small commercial establishments, and the school are served by individual wells.

In July 1991, routine water quality sampling revealed the presence of bacterial contamination in a number of wells throughout the community. Water in Lost River, which flows through Bonanza, is backed up to make it possible to divert water for irrigation. The Oregon Health Division observed that when this occurs, the normal head relationship between groundwater and surface water can be reversed, allowing surface water to percolate underground. When it does so, the surface water flows into the aquifer and carries with it bacteria. Because this reversal takes place when the stream surface is higher than groundwater levels, the phenomenon occurs more easily when groundwater levels are lower than normal.

The bacterial problems were discovered after several years of below average precipitation. The reduced precipitation resulted in diminished recharge to the aquifer which, in turn, resulted in a lowered groundwater level—just the circumstances that favor groundwater contamination in the manner described by the Health Division. Any increases in groundwater pumping to supplement an inadequate surface water resource would further lower groundwater levels.

B. Water Right Applications:

In the area of concern, there are at present groundwater rights issued for a cumulative total of 47 cubic feet per second (cfs). In addition to those, applications have been filed for an additional 37 cfs for primary irrigation and 106 cfs for supplemental irrigation from groundwater.

C. Surface Water Sources:

Much of the flow of the Lost River is due to storage releases from BOR projects. The remainder is due to groundwater discharge. Once groundwater discharges, it becomes surface water and as such is available for diversion. While some

groundwater discharge doubtless occurs at numerous sites along the stream channel, the most prominent discharge is Bonanza Springs.

Discharge from Bonanza Springs is poorly documented through time, but a number of measurements have been taken by U.S. Geological Survey and BOR personnel. In 1992, discharge measurements varied somewhat around 20 cfs, while historic discharge rates typically have been between 80 and 100 cfs. This discharge and the storage releases from BOR projects combine to create the flows in Lost River. These flows are relied upon by downstream surface water appropriators.

D. Department Action:

In addition to the meeting in Bonanza on April 12 of this year, staff have also met with a number of the area residents several times during the final phases of investigation and report writing. These meetings focused on issues that the residents felt needed to be addressed in the report and on water right processing and conditioning issues. All the meetings held were helpful for staff in identifying and clarifying issues important to the area. They were also helpful in that they afforded an opportunity for local residents to identify for staff data or analyses that were in disagreement with their knowledge or understanding of the area.

Staff will use study information to assist in evaluating objections to pending applications. As mentioned above, an additional meeting will be held soon with the local residents and the objectors to try to resolve objections through an ADR process.

E. Groundwater Study:

The groundwater study lasted one year. This is admittedly short when considering the kinds of data usually required to describe a groundwater flow system and the effects upon it of pumping wells. Our approach relied heavily on work completed by others, principally U.S. Geological Survey personnel, in the area. Recent (1992) work by Sherrod and Pickthorn proved to be of particular value. Staff collected some additional groundwater level data and stream flow data. Staff were unable to measure actual groundwater pumping but did compile data relative to cumulative appropriation rates allowed under permit. Gross estimates of actual pumping can be made from these data, but they cannot be used to estimate which wells were pumped, at what rate, and when.

Staff drew a number of conclusions from the study, but four are most significant to the resolution of the objections to technical reviews. These four are:

- 1) All the various stratigraphic units present within the study area to a depth of approximately 500-600 ft. are hydraulically inter-connected and are, therefore,

considered to be a single aquifer, even though the hydraulic properties of the individual units are widely disparate.

- 2) The aquifer is readily accessible to the atmosphere and water levels in the aquifer respond to climatic events.
- 3) Aquifer water levels respond to groundwater pumping.
- 4) The aquifer is hydraulically connected to surface water. The discharge at Bonanza Springs is the most obvious connection.

Staff also recommend that the Department:

- 1) Continue monitoring groundwater levels in the area to further define recharge/discharge relationships in the aquifer, to refine the relationship of head changes to pumping and to better document and map highly and poorly transmissive units in the aquifer;
- 2) Measure groundwater use to allow development of a more quantitative relationship between pumping and water level behavior; and
- 3) Monitor stream flow at least twice annually to better be able to quantify the groundwater contribution to stream flow.

In addition, so that town residents can better assess how to obtain safe and dependable water supplies, staff urge Bonanza town residents to:

- 4) Have their individual wells tested several times throughout the year to better be able to associate water quality problems with groundwater and surface water conditions;
- 5) Repair or abandon any wells with construction defects that may facilitate contamination of the wells or the aquifer; and
- 6) Collectively reexamine the feasibility of a community water system, and individually consider constructing wells to include deeper casings and seals.

F. 4/12/94 Meeting in Bonanza:

Staff held a public information meeting in Bonanza on April 12, 1994. At that meeting, staff presented the report and its findings. Staff also listened to criticism of the report and have made modifications to the text where possible to accommodate concerns expressed. Some of the concerns cannot be addressed at this time given the constraints of current data. The concerns have been paraphrased and categorized in Attachment 1 which also contains staff responses to those concerns.

G. Permit Processing:

In August 1993, the Department announced technical review reports for a number of applications for use of groundwater within the Bonanza area. The technical review reports proposed conditions to address concerns regarding the potential for interference with surface water in the Bonanza area. The proposed conditions

would allow an opportunity for the use of water on a temporary basis pending the collection of data to support or refine the groundwater study. These conditions (Attachment 2) include measurement and reporting of water use which would be used to determine how the groundwater pumping impacts surface water. 

The applicants and interested parties, including the BOR, ODFW and WaterWatch of Oregon, filed objections to our technical review reports. These objections have raised valid public interest issues. The applicants and objectors now have an opportunity to engage in ADR and to request the Director to facilitate the discussions.

Permit processing could take several different directions from this point forward. The applicants and objectors may be able to resolve the issues on their own. If so, the parties would execute a settlement agreement setting forth such resolution and submitting the agreement to the Director for review.

Alternatively, the Commission, in cases described in OAR 690-11-185(2) or the Director, in cases described in OAR 690-11-185(3), may determine that the proposed water use described in the applications may or will impair or be detrimental to the public interest. Such determination leads to a contested case.

Finally, the Director may find that the settlement agreement does not resolve the technical review or public interest issues. This finding also results in a contested case hearing.

H. Report Implications:

Most wells in the town of Bonanza are shallow and are constructed with minimal casing and seal. With wells constructed as they currently are, and with area surface water supplies being managed as they currently are, individual water supplies are at risk from at least a water quality perspective if groundwater levels are lowered. That lowering can be caused either by drought or by groundwater pumping. If water quality impacts are the only ones, they can likely be resolved by reconstructing wells deeper into the aquifer and extending casings and seals to greater depths, since the contamination likely resides at and near the surface of the groundwater body. This, of course, cannot be done without considerable expense to the individual well owners.

If water quantity is adversely affected in the town wells, once again deepening the wells seems to be the answer. If there is more water available at depth within the same source, the Department requires appropriators to make a good faith effort to fully develop the source before a junior will be regulated. Our interpretation as a result of this study is that the upper 500 to 600 feet of geologic materials in this area constitute a single aquifer. Unless it is shown that there is insufficient water

available at greater depth to satisfy the prior appropriators' needs, shallow community wells would have to be deepened in the event groundwater levels drop significantly. However, quantity problems have not arisen to date.

Given that lowering groundwater levels results in decreased spring flow and thereby causes a reduction in surface water availability, and that pumping lowers groundwater levels, it is inevitable that increasing the demand on the groundwater resource will impact flows in Lost River. To the extent that issuance of new groundwater rights results in increased groundwater appropriations, the water levels in the aquifer will be lowered and surface water availability diminished.

The degree to which any individual appropriation affects the river and the timing of the effect are dependent upon proximity to the river and pumping time and rate. Not all proposed new appropriations will have the same effect.

Many of the proposed new appropriations are for supplemental use of groundwater. Surface water would be used as long as it is available with groundwater making up any deficit. In years of normal or abundant surface water supplies there would be relatively small surface water impacts from groundwater appropriation. However, in dry years, years when groundwater levels are already somewhat lowered in response to reduced precipitation, groundwater pumping would be at its greatest. The resultant impacts on surface water would, of course, be at a time when surface water is already most stressed.

Nothing in the investigation suggested there is insufficient groundwater to satisfy the proposed new appropriations. The principal concern is with the interference those appropriations will have with surface water.

I. Unanswered Concerns:

Perhaps the most significant shortcoming of the investigation is that it is only qualitative in nature. Without knowing how much groundwater is being pumped, staff are unable to estimate surface water impacts, to relate water level declines to pumped volumes or to separate drought effects from pumping effects. Specific groundwater pumpage data are not available.

A second deficiency is with surface water measurement. Improvement in the methods and place of measurement and an increased frequency of measurement would add to staff's ability to document and quantify interference effects.

The investigation does not attempt to identify surface water needs for fish and aquatic life. It does not examine the downstream demand potential under terms of existing surface water rights. It also does not investigate the availability of additional groundwater at depth below the town of Bonanza.

J. Department Plans:

Staff will pursue completion of the application process already begun. All pending applications have been issued technical reviews. All technical reviews have been the subject of objections. Another public meeting is planned for the near future to include all applicants and objectors. Staff hope to resolve the outstanding issues through an alternative dispute resolution process to be begun at that meeting. The Division 11 process would be followed through to issuance or denial.

K. Future Commission Follow-Up:

Staff expect to continue some level of data collection in the Bonanza area. To some extent, the level will be dependent upon the outcome of any alternative dispute resolution process that may develop. The data collection plan will almost certainly involve measuring groundwater use. These and other data and their analyses will serve as the basis for extension of the permits beyond their first five years if they are ultimately issued with a five-year expiration as contemplated in the technical reviews.

IV. Recommendation

Staff and the Director have no recommendation. This report is intended only as an information item.

Attachments: 1) Comments and Responses to 4/12/94 Meeting
 2) Proposed Permit Conditions

Frederick G. Lissner, Steve Brown
May 6, 1994
378-8455, Ext. 204

Comments and Responses, 4/12/94 Meeting

- 1) There is no shortage of groundwater. 1992-93 precipitation caused groundwater level recovery.

Staff Response: Staff agree. There is no evidence that the groundwater resource is unable to sustain additional appropriation. Concern is for the impacts on surface water of additional groundwater appropriation.

- 2) Drought is responsible for lower water levels, and we need to compare drought effects now with those prior to development.

Staff Response: Staff partially agree. Drought is certainly a factor in the lowered water levels and decreased spring discharge observed early in this decade. However, additional pumping, because it draws down the aquifer water levels, only exacerbates the problem. While there may be some change in aquifer response to drought conditions as a result of land use changes, a study thereof does not seem germane since our real concern is with the issuance of additional water rights under today's conditions.

- 3) Study area boundaries were questioned: do ridge lines block groundwater flow; does all the study area connect to the Bonanza Springs; are some areas within the study boundaries excludable from the conclusions of the study?

Staff Response: Indeed ridge tops can be groundwater divides or barriers to groundwater flow. They can also allow flow to occur. Which is the case in the study area was not investigated. Throughout the study area, the lower elevations are underlain by geologic materials that are all interconnected hydrologically. In theory, at least, all such areas are hydraulically connected to Bonanza Springs. However, parts of the study area are sufficiently remote from the springs that, as a practical matter, pumping groundwater in those localities would have little or no effect of the spring discharge in the course of an irrigation season. However, that does not mean that pumping in those locations does not impact surface water. There are other surface water impacts than those readily observable at Bonanza Springs. Whether any areas are excludable from the conclusions of the study depends on a variety of factors that are examined during the water right issuance process.

4) Questions about local knowledge that did not seem to be answered by the report: Many of the applications listed in the report as being for primary water groundwater rights should be listed as being supplemental. Some wells that seem appropriate to include in the study are not included. Even when river levels are up, the aquifer levels remain low; doesn't that suggest the two are not connected? Some of the wells used as data points in the study have short casings and others long ones. How can data from those be compared? Spring flow dropped off in 1990 and 1991, but there were no new wells drilled then. Doesn't this suggest drought, and not pumping, is the cause of the water level declines? Annual flood irrigation recharges 40,000 acre feet of water to the aquifer, but in 1990-91 there was no flood irrigation. Isn't that the cause of lower water levels in the aquifer? Water use is not metered. How can pumping be blamed for the water level declines?

Staff Response:

--Staff have corrected the data tables based on information in the water right application files and have picked up wells that were suggested for inclusion to the extent that data were available.

--River levels higher than groundwater levels may be indicative of a variety of circumstances, but the most likely is that the aquifer materials in the vicinity of the observations are only poorly transmissive. That does not mean there is no connection between the two, but only that insufficient time has passed for the water levels to equalize, or that local pumping is holding aquifer water levels artificially low and, because of the lower transmissivity, surface water cannot flow into the aquifer rapidly enough to counteract the pumping.

--Water levels throughout the study area do not seem to depend upon what stratigraphic materials are tapped by the wells in which the water level observations are made. Materials at depth have the same heads as shallower materials because of the hydraulic connection and because groundwater gradients in the area are shallow. As a result, the length of casing is immaterial insofar as determining the static water level.

--We do not have pumping records to address the issue of whether there was more groundwater pumping in 1990-91 because of the drought. If there was not, then clearly deficient recharge due to reduced precipitation could be the cause of lower groundwater levels and decreased spring flow. However, at least one resident asserts that groundwater levels were lower because there were 40,000 acre feet less recharge since there was no flood irrigation in those years. In either case the relationship between water levels in the aquifer and discharge at Bonanza Springs seems clear. It does not much matter what the cause of water level lowering in the aquifer is, when the level is lowered, spring flow drops off. If pumping can also be a cause for lowering the aquifer water level, then it as well as drought can reduce spring flow and thereby impact surface water availability. Our study concludes that groundwater pumping does, in fact, lower aquifer water levels.

--The lack of metering on groundwater appropriations is a major shortcoming. Without it, it is not possible to estimate with any certainty in this study area how much groundwater is pumped. Because of this, our study is qualitative rather than quantitative in its conclusions. Accurate water use data would enhance our understanding of the hydrologic system.

5) Town residents expressed great concern over their continued ability to use groundwater as a source of potable water.

Staff Response: With wells constructed as they currently are in Bonanza, and with area surface water supplies being managed as they currently are, individual water supplies are at risk from at least a water quality perspective.

6) The Department should be a facilitator to find a solution to the water conflict in the area.

Staff Response: It is the Department's hope that through alternative dispute resolution we can do just that.

7) Several suggestions were offered that, if followed, would add credibility to staff's conclusions. There should be a more sophisticated method of measuring spring discharge, and measurements should be taken more frequently, if not continuously. The new wells should be allowed to be pumped and additional data collected during pumping would better define local hydrologic conditions. Specific tests should be organized involving pumping particular wells and measuring the impacts. There should be more study of drought impacts and the effects of land use changes on the aquifer.

Staff Response: Staff agree with the comments relative to spring measurements and specific interference testing. Whether these are ultimately needed will depend, at least in part, on the outcome of our future attempts to resolve objections to the technical reviews. Similarly, whether new wells are allowed to pump will hopefully be determined in the same process. Staff is less enthusiastic about examining historical drought impacts on spring flow given that it is today's conditions which are expected to accommodate additional groundwater development.

8) Several folks expressed frustration at having made large investments to drill wells and install pumps, but, because permits are not yet issued, they cannot realize any return on those investments.

Staff Response: There are no guarantees that permits will ultimately be issued. The Department proposed issuance with conditions. That was not acceptable to all concerned. The issue awaits resolution.

9) Department staff should broaden the overall investigation to include a study of area water management practices and their impacts.

Staff Response: Such a study is beyond what staff currently contemplate. If it becomes apparent that such a study is necessary to resolve issues surrounding applications for groundwater rights, staff will reconsider.

10) Department staff should formulate a plan to deal with a repeat of the 1992 experience should it occur.

Staff Response: It is staff's intent to deal with such occurrence through permit conditions and field presence.

11) The technical report should include a description of the author's qualifications.

Staff Response: Reports in the Groundwater series have not historically included such information. Reports are not released until they are approved internally, and the Department is responsible for their content.

MEMORANDUM

TO: Water Resources Commission

FROM: Director *grd*

SUBJECT: Agenda Item E, October 1, 1993
Water Resources Commission Meeting

WATER
RESOURCES
DEPARTMENT

Status Report on Groundwater Conditions and Water Use Application
Processing in the Bonanza Area, Klamath County

I. Issue Statement

Concerns about groundwater levels in the Bonanza area of Klamath County have been expressed during the past year by Department staff and others. This staff report presents an preliminary analysis of the issues associated with management of the groundwater resources of the Bonanza area. Included are those issues relating to emergency drought and standard Division 11 water right permitting.

II. Background

At its August meeting, the Commission asked staff to provide an update of the Bonanza issue at the next Commission meeting.

In the winter and spring of 1992, staff looked briefly at the Bonanza area geology and hydrology to evaluate the possible connection of ground- and surface water. As a result, on June 5, 1992, the Department recommended that the Commission authorize staff to begin proceedings to withdraw the local groundwater resources from further appropriation until staff could complete a more thorough look at the area water resources. A copy of that staff report is appended as Attachment 1.

Residents objected, indicating that they had not experienced surface water shortages. In addition, they did not think additional groundwater development would deplete surface water supplies.

In response, the Commission opted not to begin withdrawal proceedings. At that point, staff continued to process applications in accordance with rules and procedures already in place. Technical reviews have now been completed for the Bonanza area groundwater applications. However, permits were not issued in time for the 1993 irrigation season. As a result, some appropriators began the irrigation season pumping under terms of drought permits, but they were unable to continue pumping when the drought declaration for Klamath County was rescinded on July 8. Others found themselves without the ability to pump groundwater at all.



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In response to continued concerns, staff, in August, 1992, began a more intensive study of the area groundwater resources. At present, field data collection and data analysis are complete and report preparation is underway.

III. Evaluation

A. Bonanza Water Quality Problems

Bonanza is a small agricultural community 20 miles east of Klamath Falls. The community is dependent on groundwater for drinking water. There is no community water system, however. Residences, the several small commercial establishments and the school are served by individual wells.

In July of 1991, routine water quality sampling revealed the presence of bacterial contamination in a number of wells throughout the community. In response, the Oregon Health Division (HD) began an investigation to identify the cause(s) and possible solutions. HD concluded that there is a hydraulic connection between ground- and surface water in the area. They further conclude that when water in Lost River, which flows through Bonanza, is backed up to make it possible to divert water for irrigation, the normal head relationship between groundwater and surface water may be reversed, allowing surface water to percolate underground. As the surface water then percolates into the aquifer, it carries with it bacteria.

Health Division further concluded that this process may be accentuated when groundwater levels are lowered by pumping. The bacterial problems were discovered after several years of below average precipitation and increased groundwater pumping. The reduced precipitation resulted in diminished recharge to the aquifer which, in turn, would result in a lowered groundwater level. Increased ground water pumping to supplement the inadequate surface water resource would further lower the groundwater levels.

B. Groundwater Development

Following release of HD's findings in January 1992, Department staff became concerned about the ground-/surface water system for another, but related, reason. HD's conclusion that the ground- and surface water in the area are hydraulically connected suggests that groundwater appropriation may interfere with surface water users. Given that concern, the Department needs to carefully examine new applications for groundwater use permits for possible impacts on surface water availability. In the area of concern there are at present groundwater rights issued for a cumulative total of 47 cubic feet per second (cfs). In addition during the

drought, the Department issued drought emergency permits for 39 cfs. Many of the appropriators who applied for drought permits also simultaneously applied for permanent primary or supplemental groundwater rights. In addition to those, many others have also applied for groundwater rights. Currently pending in the Department are applications for a total of 51 cfs for primary irrigation and 94 cfs for supplemental irrigation from groundwater.

C. Surface Water Sources

Much of the flow of the Lost River is due to storage releases from Bureau of Reclamation (BOR) projects. The remainder is due to groundwater discharge. Once groundwater discharges, it becomes surface water and is available for appropriation as such. While some groundwater discharge doubtless occurs at numerous sites along the stream channel, the most prominent discharge is Bonanza Springs.

Discharge from Bonanza Springs is poorly documented through time. However, the measurements that do exist indicate discharge rates generally between 80 and 100 cfs. This discharge, the other groundwater discharges to the channel and the storage releases from BOR projects combine to create the flows in Lost River. These flows are relied upon by downstream surface water appropriators.

D. Hydrogeologic Study

In the summer of 1991 Bonanza Springs ceased to flow, and surface water made its way into the aquifer resulting in the contamination HD documented. The same phenomenon occurred in the summers of 1992 and 93.

Staff assisted HD in its 1991 investigation. At the time HD's report was released, it was not clear whether the demise of Bonanza Spring was predominantly the result of increased groundwater pumpage or decreased groundwater recharge due to reduced precipitation. In either case, staff was concerned that issuance of additional water rights without a better understanding of the area hydrogeology could exacerbate the spring depletion problem. The results would likely be continued deterioration of the groundwater quality and down-stream surface water shortages. The latter would, in turn, result in increased need for distribution by the local watermaster.

E. Groundwater/Surface Water System

The most important conclusion to date in the Bonanza groundwater investigation is that there is a direct connection between groundwater and surface water. The

discharge from Bonanza Springs correlates closely with changes in groundwater levels. Increases in head in the aquifer result in increases in spring discharge.

There is a correlation between water levels in wells and overall stream flows. Pumping groundwater lowers aquifer water levels and, therefore, reduces surface water flows. As would be expected, observation wells at greater distances from the stream experience a greater water level fluctuation per unit of change in spring discharge than do wells nearer to the stream.

Wells farther from the stream, when pumped, will not have as immediate of an effect on the spring discharge as will those that are nearer to the stream. However, the aquifer is highly transmissive. Pumping effects spread quickly resulting in well-to-well and, more importantly, well-to-surface water interference soon after pumping begins no matter where the pumping wells are located. This is affirmed by this summer's observations that, although the springs did recover somewhat through the fall and winter seasons, discharge dropped off quickly when groundwater pumping began early in the 1993 irrigation season.

More details will be available upon completion of the technical report scheduled for late this year. At that time staff will more thoroughly brief the Commission and, perhaps, make recommendations relative to the further development of the resource.

F. 1993 Surface Water Availability

On July 8, the drought declaration in Klamath County was lifted. At that point appropriators who had been using groundwater under terms of more than 40 drought emergency permits found themselves unable to use groundwater for irrigation.

Some of these irrigators had moved parts of their surface water pumping plants and power lines to their drought permit wells. Prior to the drought declaration being lifted, they had claimed that it would be an excessive financial burden to move this equipment back to the original surface water points of diversion and urged, therefore, that the drought declaration not be lifted. Clearly, their argument was not persuasive. After the drought declaration was lifted and the emergency permits had thus expired, the Klamath County watermaster discussed with the permittees the necessity of returning to their original surface water diversion points.

The watermaster reports that while the springs that discharge to Lost River have not yet fully recovered from the drought, surface water supplies have been adequate

this summer due to recovery of the storage facilities. However, new minimum pool requirements for Klamath Lake, Gerber Reservoir and Clear Lake have been established by the BOR in consultation with the U.S. Fish and Wildlife Service pursuant to the Endangered Species Act. These reservoirs are the main supply for the entire Klamath Project operated by the BOR and local irrigation and drainage districts. While these minimum pools have not affected the delivery of water to contract holders this season, they do have the potential to affect future water deliveries in times of low surface water supplies.

Following termination of the drought declaration, the watermaster monitored groundwater use in the Bonanza area. All groundwater users without valid primary or supplemental rights were required to terminate groundwater use. All but one complied with the regulation. That one is the subject of continuing administrative action by the Department.

G. Application Processing

Early in 1992, the BOR projected that it would be unable to satisfy all its contracts because of inadequate storage. Irrigators who would not receive Bureau water sought to replace the stored water source by developing groundwater. Sixty-four emergency drought permit applications were filed between February 28, 1992 and the end of the 1992 irrigation season. In most cases, the drought applicants also filed applications for permanent water rights. A significant number of these "dual" applicants elected to convert their water use from project water to their new groundwater developments. This decision indicated that they intended to permanently forgo use of project water, in preference to what they viewed as a more dependable groundwater supply.

As already mentioned, staff have continued to process groundwater applications from the Bonanza area. Technical reviews have been issued on a number of these applications. Each technical review proposes a rather stringent set of conditions designed to protect surface water rights from substantial interference. Attachment 2 lists these conditions and highlights with an asterisk (*) the conditions designed specifically to control groundwater/surface water interference in the Bonanza area. Generally, the conditions limit the life of a permit to five years, require metering and reporting, require periodic water level measurement and reporting and require regulation if surface water rights are interfered with substantially.

Reports of technical review for these applications were published from August 6 to August 11, 1993. The objection periods will close starting on October 13 and extending through October 20, 1993.

IV. Recommendation

This is an information item. No action is required.

- Attachments: 1) June 5, 1992, Staff Report
 2) Permit Conditions for Bonanza Area Technical Reviews

Frederick G. Lissner, Reed Marbut
378-8544, Ext. 204
September 16, 1993

MEMORANDUM

TO: Water Resources Commission
 FROM: *for* *Becky Kreeg*
 Director
 SUBJECT: Agenda Item L, June 5, 1992,
 Water Resources Commission Meeting

WATER
 RESOURCES
 DEPARTMENT

Request for authorization to initiate withdrawal proceedings for a Lost River groundwater reservoir, Klamath County.

Background

Department staff have noted declines in the discharge of Big Bonanza Springs in the Lost River Drainage of the Klamath Basin (See Big Bonanza Springs Hydrograph, Attachment 3). There are thousands of acres of land with 1905 irrigation rights dependent on flows from Big Bonanza Springs. The Department has received numerous applications in the last year for groundwater rights in the area.

The aquifer appears to be connected with the springs, and staff cannot make water availability findings with current data. Discharge rates have been monitored periodically since 1918. Measurements have been made by the Bureau of Reclamation, U.S. Geological Survey, and Water Resources Department. Measurement data gaps of 10 to 30 years are common in the record.

Spring flow measurements taken by Del Sparks (local watermaster) at Bonanza Springs indicate approximate average flow in 1980 and 1981 of 93 and 78 cubic feet per second (cfs), respectively. Measurements taken in January 1992 were 38 cfs. Observations from local residents confirm a significant decrease this year.

These springs are major contributors to the Lost River below Bonanza. Currently (May 8, 1992), Lost River is dry above Bonanza.

Discussion

The Lost River meanders through several small fault-bounded basins in south-central Oregon. The small basins include the Langell, Yonna, and Poe Valleys near Bonanza. The city of Bonanza is located where the Langell and Yonna Valleys connect.

Three state observation wells are located in the southern Yonna and northern Langell Valleys. All three wells have exhibited steady decline since about 1985 (See Monitoring Wells Hydrographs, Attachment 4). The three wells have declined a total of about five feet in this period. There are no observation wells currently monitored in the immediate vicinity of Bonanza.



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Two main aquifer units are present in the Lost River area. The upper unit is composed of unconsolidated to poorly consolidated sediments and the lower aquifer is within basalt rock units. Results of contouring and cross section analysis indicate that the lower basalt aquifer unit is deformed. Staff's preliminary conclusion is that the deformation has resulted in the lower basalt aquifer unit occurring at approximately 200 feet below land surface within the valley floor area and near land surface adjacent to the local ridge alignments. Also, the vast majority of wells in the Bonanza area are completed in the lower basalt aquifer. The significance of these findings is that the deeper wells within the valley are, most likely, hydraulically connected to the shallower wells and springs located near the ridges.

Ground Water Report 21 prepared by the U.S. Geologic Survey, November 1974, estimates that an average of 60,000 acre feet of Lost River Basin surface water flows come from groundwater contributions.

Since 1974, the Department has issued permits that allow appropriation of up to 30,000 acre feet of groundwater annually in the Lost River Basin. Pending applications to use groundwater in the basin (see Attachment 5), if approved, could appropriate an additional 30,000 acre feet per year. Many of the pending applications are for supplemental uses to augment inadequate supplies caused by the drought.

Additionally, hydroelectric application HE 531, in the name of Energy Storage Partners, has been filed to develop a pump-storage project. This proposes to appropriate 12,000 to 15,000 acre feet of groundwater initially to fill a surface reservoir. After the initial filling, it is anticipated that 500 to 1,000 acre feet would be needed annually to compensate for evaporation and seepage losses. The stored water would be used to generate 1,000 megawatts of electricity by draining this reservoir into another at a lower elevation during peak energy demand periods. When energy demands were low, the water in the lower reservoir would be pumped back to the higher elevation storage site.

A drought emergency was declared in Klamath County on February 28, 1992. This allows the filing of applications for emergency drought permits under ORS 536.700 to 536.780 and Chapter 690, Division 19, administrative rules.

The city of Bonanza does not have a municipal water system. All residences use shallow wells for domestic purposes. In 1991, fecal coliform was detected in many wells at levels that exceed state and federal standards. The Health Division of the Department of Human Resources has recommended that the city develop a municipal water system from a deep well.

The observation well and miscellaneous spring flow measurements indicate that both groundwater levels and springflows are declining. We are currently unable to distinguish the amount of groundwater and springflow decline that is attributable to groundwater use from that which may be caused by the lack of precipitation in recent years. Our initial judgement is that the lack of precipitation is probably the major cause of the declines.

Evaluation

Staff recognizes four issues in the Lost River area that need resolution by the Commission. The issues include the disposition of pending groundwater right applications, the Bonanza municipal water supply, issuance of drought permits, and regulation of groundwater in order to maintain surface water supplies.

Pending groundwater applications totaling approximately 30,000 acre-feet represent a doubling of the groundwater appropriations issued in the area since 1974. Preliminary findings indicate that the groundwater may not be available without injury to existing rights, specifically surface water rights from the Lost River which is supported by spring discharge. Staff is also unable to determine at this time what total impacts to the groundwater and surface water resources will result from issuing the pending groundwater applications.

Some of the domestic water supplies within the city of Bonanza have proven to be vulnerable to contamination. A solution for the city of Bonanza may be the development of a municipal water supply. A municipal supply would mostly represent a replacement of a similar quantity of water currently pumped from many wells.

Drought permits are being issued as an alternative to issuing permanent groundwater permits. Staff concludes that the temporary nature of drought permits do not pose a long-term threat to the groundwater or surface water resources.

The decline in discharge rates at Big Bonanza Springs and water

level declines in state observation wells indicate a regional lowering of the groundwater surface in the Lost River area. Staff has concluded that the declines are not substantial enough at this time to be concerned about groundwater overdraft. However, the regional water level decline is causing substantial interference with some springs, specifically Big Bonanza Springs.

The Groundwater/Hydrology Section is unable to commit staff to analyze this problem until the beginning of the next biennium. In the interim, groundwater staff will identify specific data collection tasks that will be carried out during this biennium by the regional staffs.

Alternatives

There are several alternative courses of action to prevent this.

1. Do nothing and continue the current practice of accepting groundwater applications. However, as they are reviewed, due to surface water interference and limited surface water supplies, staff would propose action in accordance with Division 9 rules. If an applicant protested, the application would be sent to a contested case hearing for a public interest determination.
2. Except for drought applications, stop processing existing and new groundwater applications until we know more about the resource. Under this scenario, pending and new applications would remain on file until either the resource recovers (the springs flow at historic levels), staff completes a groundwater study or someone else completes the study that better explains the resource, or an applicant insists that their application be processed.
3. By order and rule, withdraw, for a specified time, the groundwater reservoir from further appropriation for permitted uses and hold all pending applications until either:
 - 1) The Commission determines, through Department studies or the submission of information from others, that groundwater resources can satisfy additional appropriation without harm to the public interest; or

- 2) Flows at Big Bonanza Springs recover to historic rates; or
 - 3) The withdrawal expires in 1997 when we would process remaining applications based upon information available at that time.
4. By order and rule, withdraw, for a specified time, the groundwater reservoir from further appropriation with exceptions for municipal use by the city of Bonanza, the exempt uses of groundwater listed in OAR 537.545 and drought permits for any use and hold all pending applications until either:
- 1) The Commission determines, through its own studies or the submission of information from others, that groundwater resources can satisfy additional appropriation without harm to the public interest; or
 - 2) Flows at Big Bonanza Springs recover to historic rates; or
 - 3) The withdrawal expires in 1997 when we would process remaining applications based upon information available at that time.

Exempt groundwater uses do not represent a large volume of use. Therefore, none of the proposed alternatives would limit the development of groundwater uses statutorily exempt from permit requirements by ORS 537.545.

However, because of declining surface water flows and the impact groundwater development is anticipated to have on surface water resources the Commission must take some action.

Alternative 1 would have the Department continue to accept new applications while we are simultaneously proposing some for rejection. We would likely schedule a contested case on a protested rejection soon. Staff does not see any likelihood that a hearings officer could recommend issuance of even a conditioned permit with the information we now have. Therefore, Alternative 1 is not recommended.

An advantage of alternative 2 is that while it allows new

applications to be filed, all applicants are placed on notice that no action is anticipated in the near future.

Alternative 2 also recognizes that the area has been declared to be in a drought emergency. This declaration is an attempt to respond to an emergency situation. Since drought permits represent only a short lived demand on the groundwater resource, we think an exception for drought permits is appropriate. Under Alternatives 2, if a standard permit applicant were to insist that their application be processed, we would likely propose rejection and, if a protest is filed, hold a contested case hearing.

A withdrawal, unless otherwise conditioned would eliminate the continued acceptance of new applications. A withdrawal could be worded to allow acceptance of applications for specified uses only. A withdrawal could also discuss the disposal of pending applications.

For this reason the opportunities to issue permits for pending applications when more information is available were developed for both withdrawal options. The acceptance of information from third parties is to recognize the potential for applicants to sponsor a hydrologic investigation which the Department may not otherwise be able to accomplish in the near future. The withdrawal options also recognize that the primary concern or indication of a significant problem is the decline in flows at Big Bonanza Springs. Option 3. may severely limit the city of Bonanza's ability to solve its water quality problem. The city of Bonanza exception in Alternative 4. would not guarantee that a permit would be granted. In fact, since the use is apt to impact senior rights, a contested case hearing would be likely. But, in the contested case, it may be found that the public interest is best served by allowing such a use, particularly in view of the fact that the community system may not pump significantly more water than the cumulative total of all the current individual wells in the town.

Both Alternatives 3. and 4. put an expiration date on the withdrawal. If within five years, the resource fails to recover another withdrawal or a restrictive classification would be in order. Alternatively we might then, with additional information, be able to restrictively condition applications in a way that protects the public interest.

Our legal counsel feels that the State Agency Coordination (SAC)

Program is not entirely clear as to the proper method to accomplish a withdrawal. The Department is currently involved in litigation over this issue. In anticipation of court resolution, we recommend a conservative approach. Therefore, both a withdrawal by order and rulemaking are proposed in Alternatives 3. and 4.

The withdrawal statute (ORS 536.410) requires public notice and a hearing. The same notice and hearing could be used to receive testimony on both a proposed order and a draft rule.

Staff feels Alternative 4. is the most equitable approach to protect the public interest associated with the water resources of the area. This alternative is more fully developed in Attachment 1.

The initiation of these proceedings begins a public process whereby additional options may be developed and considered. Prompt notice to applicants and the public is needed. This would allow potential uses to make informed decisions whether to make substantial investments in well construction.

The groundwater flow system in the area is complex. Because of this, the precise boundaries of the aquifer are difficult to define. Attachment 2 is a map showing the extent of land area which staff feels should be affected by any withdrawal. No new permits will be issued for appropriations within this area prior to some Commission direction.

Should the Department take on a study of the groundwater resource, the important considerations include:

1. Quantifying the impact groundwater appropriations have on surface water resources;
2. Determining the availability of groundwater resources.

Summation

1. Springflows in the Bonanza area are declining.
2. Groundwater levels also show a declining trend.
3. Groundwater appears to be hydraulically connected to surface

water supplies.

4. Additional surface water supplies in the area are unavailable.
5. Many applications are pending.
6. Staff developed three alternative withdrawal proposals.
7. Alternative 4. recommended. This would temporarily close the resource to all new uses except for municipal use by the city of Bonanza, emergency drought permits, and exempt uses.
8. Until directed otherwise, the Department has stopped issuing permits for appropriations within the area shown on Attachment 2.

Director's Recommendation

The staff recommends Alternative 4. that the Commission authorize the initiation of withdrawal and rulemaking proceedings for a Lost River groundwater reservoir in the Bonanza Springs area, with exceptions for the city of Bonanza, drought permits and exempt uses; existing applications would be held until the springflows recover, new information is found that shows new uses would not harm the public interest, or December of 1997.

- Attachments:
1. Proposed Withdrawal Order
 2. Map of Proposed Withdrawal Area
 3. Big Bonanza Springs Hydrograph
 4. Monitoring Wells Hydrographs
 5. List of pending applications

Mattick, Lite
378-3739
May 22, 1991

MEMORANDUM

TO: Water Resources Commission
FROM: *Becky Kragg*
Director
SUBJECT: Agenda Item L, June 5, 1992,
Water Resources Commission Meeting

WATER
RESOURCES
DEPARTMENT

Request for authorization to initiate withdrawal proceedings for a Lost River groundwater reservoir, Klamath County.

Background

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Director's Recommendation

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River groundwater reservoir in the Bonanza Springs area, with exceptions for the city of Bonanza, drought permits and exempt uses; existing applications would be held until the springflows recover, new information is found that shows new uses would not harm the public interest, or December of 1997.

- Attachments:
1. Proposed Withdrawal Order
 2. Map of Proposed Withdrawal Area
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 4. Monitoring Wells Hydrographs
 5. List of pending applications

Mattick, Lite
378-3739
May 22, 1991

May 15, 1995

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

Re: Denial of Objections to Application File Numbers:

G 12493	G 12494	G 13514	Circle Five Ranch
G 12618			Haskins & Co Inc
G 12644			Lost River Ranch
G 12732			Earl Weirisma
G 12735			George Teague
G 12746			Donald Horsley
G 12766			William B. Hill
G 12768			Elso DeJong
G 12772			Carl Gibson
G 12777	G 12808		Halousek Brothers
G 12811			Lynn R. Pope
G 12814			Donald R. Manning
G 12860			Weyerhaeuser Co.
G 12874			Kenneth Masten
G 12876			Charles Masten and Ned Goecken
G 12885 77			S. C. Masten
G 12885			Gary Williams (Peggy Biaggi)
G 12935			John Dark
G 12955			B. Bennett & J. Connelly
G 12972	G 13184		Balin Ranches
G 12994			Charles Cheyne
G 13011			W. E. Hammerich
G 13019			Wells Farms Inc.
G 13101			Barrett Livestock
G 13106			Grohs Ranch
G 13387			William DeJong

Dear Ms. Russell:

The Director of the Water Resources Department has reviewed the Objections filed jointly by WaterWatch and Oregon Natural Resources Congress to the proposed water use reported in the Satisfactory Report of Technical Review announced for the application files listed above. In light of the agreement that was reached between the Oregon Department of Fish and Wildlife (ODFW), Bureau of Reclamation (BOR) and the above-listed applicants, the Director has determined that all of your Objections to the proposed uses are hereby denied.



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158 12th Street NE
Salem, OR 97310-0210
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Karen Russell, Assistant Director
May 15, 1995
Page Two

Attached is a list of conditions that will be included on each permit for the Applications. The conditions numbered two and three are specific to each application and will be excluded and/or individually tailored as appropriate.

These conditions were agreed to by the BOR, ODFW and the Applicants during the Alternative Dispute Resolution meetings.

As a part of the settlement agreement, the ODFW and BOR have withdrawn their objections to all of the Applications listed.

The Department's Groundwater/Hydrology Section determined that use of water from the wells described in the Technical Reviews for the Applications would have the potential to interfere with the Lost River. However, the ODFW and BOR agreed that if the permits for these uses included the conditions set out in the settlement agreement, the surface flows of the Lost River would be protected.

Given the fact that the proposed conditions include a requirement for site specific monitoring for both surface and groundwater, the Department has determined that the settlement agreement conditions will adequately address the public interest issues raised by the objectors, including the issues raised in the objections of WaterWatch and ONRC.

You have alleged the Technical Report is defective and the use as proposed is not in the public interest.

You have asserted the Technical Report is defective because the report fails to contain many of the elements and evaluations required in OAR 690-11-160(1).

The rules of the Water Resources Commission require that the technical review analysis include the elements contained in OAR 690-11-160(1)(a)-(h). There is no requirement that the report of technical review include those elements. In order to maintain clarity and simplicity, a number of technical review factors included in the file checklists are not contained in the reports.

A technical review report is a summary of the technical evaluation conducted on a water use application.

Your objections do not meet the requirements of OAR 690-11-170(1). The Director has determined that you have not established that the Technical Review is defective. In addition, given the fact that each application will be conditioned in accordance with the settlement agreement, you have not identified elements of the proposed water use that may impair or be detrimental to the

Karen Russell, Assistant Director
May 15, 1995
Page Three

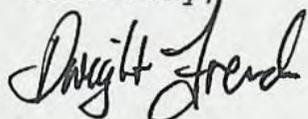
public interest. You have not set forth facts which would support allegations that the proposed water use is prohibited.

You may protest this denial of your Objections. You have thirty (30) days from the date of this letter to file a protest. Your protest must comply with the standards set out in the Oregon Administrative Rules, Chapter 690, Division Two, Sections 030 through 080. (OAR 690-02-030 through 080).

Send your protest by regular mail or deliver it in person. Your protest must be received by the Water Resources Department in Salem, Oregon, no later than 5:00 p.m. on or before June 15, 1995. Your protest must be in proper form and accompanied by a fee of \$25.00.

If you have any questions, please call.

Sincerely,

 FOR

Steven P. Applegate, Administrator
Water Rights and Adjudications Division

Enclosures: Conditions

cc: Applicants
Michael Ryan, Bureau of Reclamation
Roger Smith, Oregon Department of Fish and Wildlife
Kip Lombard, Attorney, City of Bonanza
files

PROPOSED PERMIT CONDITIONS

Water use under the permits shall be conditioned as follows:

1. Period of allowed use: April 15 through October 15 of each year.
2. (SPECIFIC TO EACH APPLICATION) Rate (cfs or gpm) and/or Volume acre/feet or gallons) of use:
3. (SPECIFIC TO EACH APPLICATION) The use of water is limited to supplemental irrigation.
4. Water use development requirements:
 - A. Begin construction by (one year from issuance of permit).
 - B. Complete construction by October 1, 1997.
 - C. Completely apply the water to beneficial use, by five years from date of issuance of permit.
5. The use of water under this permit may expire or be extended five years from the date of issuance of the permit. Alternatively, a water right certificate shall be issued at the end of the five year period if the Director finds:
 - A. River stage or Bonanza Big Spring flows are not significantly diminished by use of water under this permit as determined by the Oregon Water Resources Department, in consultation with the Bureau of Reclamation and Oregon Department of Fish and Wildlife, using quantifiable groundwater and hydrologic science that stands up to peer review;
 - B. Within two years of permit issuance for primary use, the permittee/appropriator has submitted a plan to the Commission indicating potential economical sources for an alternative long term water supply;
 - C. Periodic water level reports have been submitted; and
 - D. Excessively declining ground water levels have not occurred due to well use as determined by the Oregon Water Resources Department, in consultation with the Bureau of Reclamation and Oregon Department of Fish and Wildlife, using quantifiable groundwater and hydrologic science that stands up to peer review.
6. The amount of water used for irrigation under this right, together with the amount used under any other right existing for the same land, is limited to a diversion of ONE-

Proposed Permit Conditions
Page Two

EIGHTIETH of one cubic foot per second (or its equivalent) and 2.5 acre-feet for each acre irrigated during the irrigation season of each year.

7. Measurement, recording and reporting conditions:
 - A. Before water use may begin under this permit, the permittee/appropriator 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 by April 15, 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/appropriator shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located on private property, the watermaster shall request access upon reasonable notice.
8. The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and a pressure gauge adequate to determine water level elevation in the well at all times.
9. A static water level measurement shall be made and submitted before any use of water may commence from the well.
10. The permittee/appropriator shall obtain a static water-level measurement for each well during March and October of each year and report the measurements to the Department. The measurement shall be made by a certified water-rights examiner, registered professional geologist, certified engineering geologist, professional engineer, licensed well constructor or pump installer licensed by the Construction Contractors Board or by the permittee/appropriator under the direction of the local watermaster. Water levels shall be reported as depth-to-water below ground in feet and inches or to one-hundredth of a foot and shall be accompanied by supporting calculations. The permittee/appropriator shall report the static water level(s) in the well(s) to the Groundwater/Hydrology Section of the Water Resources Department by April 15 and November 15, respectively, of each year.

Proposed Permit Conditions
Page Three

11. If substantial interference with a senior surface or ground water right occurs due to withdrawal of water from the well(s) listed on this permit, then use of water from such well(s) shall be discontinued or reduced or the schedule of withdrawal shall be regulated until the Department approves or implements an alternative administrative action to mitigate such interference.
12. Failure to comply with any of the provisions of the permit may result in action including, but not limited to, restrictions on the use, penalties, or cancellation of the permit.
13. The permit is for the beneficial use of water without waste.
14. The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.
15. This right is limited to any deficiency in the available supply of any prior right existing for the same land.

October 4, 1994

BALIN RANCHES
13600 HOMEDALE RD
KLAMATH FALLS OR 97603

Reference: File number(s) 13184

Dear BALIN RANCHES:

At our August 15, 1994, meeting in Bonanza a number of individuals indicated that they could prove that use of water from their wells located within the study area described in the "Groundwater Open File Report" (Gorman Report # 94-01) would not have the potential for interference with the surface water of the Lost River. Naturally, if such information is available, it should be submitted to the Water Resources Department as soon as possible. Information concerning the characteristics of the Lost River area groundwater reservoir and the relationship between the groundwater and surface water are critical to our evaluation of the use of water in the area.

In addition, a number of individuals at the meeting suggested that some form of groundwater test could prove that use of groundwater does not interfere with the Lost River surface water. These individuals asked if Department staff could assist with design of a groundwater test. Specifically, it was asked "what kind of information could we develop that would allow you to grant our permits."

While it is not possible to set out the precise parameters of a successful test, we can provide some general concepts of the type of information that would be of value in either a confirmation of the Gorman Report or a modification of its conclusions.

Staff in our Groundwater/Hydrology Section suggest that the following information could be useful:

1. Geologic mapping or aquifer testing showing physical barriers to the movement of groundwater to the river from the source your well taps;
2. Interpretation of existing geologic data demonstrating the groundwater underlying the study area is a different source of water than that discharging to the Lost River surface water;



Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

October 4, 1994
Page Two

3. A well by well analysis demonstrating that the specific aquifer being tapped is different than the one that discharges to Lost River (e.g., the Lorrella project well); and
4. Water level head analysis demonstrating that the particular groundwater to be pumped from the well is at a different level than the aquifers known to be in connection with the Lost River surface water.

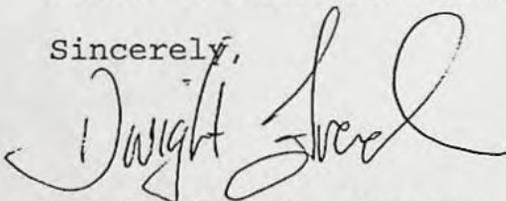
If a test includes actual test pumping, the pumping must be for a substantial period of time to demonstrate that there is no effect on the aquifer known to be in hydraulic connection with the Lost River.

It is essential that any test be designed and supervised by a qualified groundwater hydrologist. We suggest that the hydrologist review our files before the test is designed. In addition, the hydrologist should be in contact with Fred Lissner before beginning design of the test.

Given the interest in the groundwater test matter, we have put the alternative dispute resolution schedule on hold for the time being. We will not initiate our dispute resolution program until we have heard from you and other applicants concerning the test suggestion.

If you have questions concerning the groundwater test matter, please give Fred Lissner a call at (503) 378-3739. If you have questions concerning the dispute resolution, please give Reed Marbut a call (same number).

Sincerely,



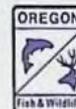
Dwight French, Manager
Water Rights Section

cc: Senator Gene Timms
Martha Pagel, Director
Bob Main, SC Region Manager
Del Sparks, Watermaster

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JAN 13 1994

WATER RESOURCES DEPT.
SALEM, OREGON



DEPARTMENT OF
FISH AND
WILDLIFE

January 11, 1994

Water Rights Section
Water Resources Department
3850 Portland Rd., NE
Salem, OR 97310

RE: Water Right Application #G-13184; Report of Technical Review

According to a WRD staff report presented to WRC June 5, 1992,¹ there is considerable speculation and some evidence that ground water and surface water in the Lost River area are interconnected to a significant degree. This fact is acknowledge in the Report. Because the proposed groundwater withdrawal appears to have a strong potential for reducing flows in Lost River and other area streams, ODFW harbors serious reservations regarding impacts on streamflows and fish populations that depend on them.

Lost River sucker ("mullet"; *Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are indigenous to the Klamath Lake watershed. Recent surveys by BOR personnel² have verified that the latter species, at least, is reproducing in Lost River in the areas that would potentially be impacted by some or all of the proposed appropriations. Because these aging populations are showing very little or no annual juvenile recruitment over much of their historical range, Oregon and the federal government (USFWS) have listed them as "endangered" throughout their historic range. Numerous large and small unscreened BOR, PGE and irrigation diversions and marsh drainage for agriculture have profoundly modified the historic habitat base for these unique fish. Continued diminishment of surface water resources could easily push these species to extinction before recovery efforts can improve the situation.

¹Agenda Item L; Request for authorization to initiate withdrawal proceedings for a Lost River groundwater reservoir, Klamath County.

²Buettner, personal communication--(503) 883-6935, Klamath Falls



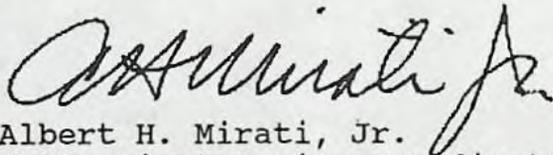
WR G-13184
January 11, 1994
Page 2

Because Lost River and its tributary creeks and springs contain 2 listed T&E species, ODFW is concerned that permitting these appropriations will exacerbate instream flow problems that already exist. There is considerable information on Lost River and short-nose suckers that indicates these species rely heavily on springs in the Lost River basin for spawning and some rearing. Several isolated and genetically distinct populations of suckers have already been lost, arguably due to dewatering or destruction of critical spring habitats.

With the above in mind, ODFW hereby objects to the issuance of a permit for the subject groundwater application because there is reason to believe that groundwater withdrawals will deplete surface flows in this basin. We believe that development of this permit could have serious negative impacts on local fish populations, especially the 2 listed species of suckers, and would, therefore, be contrary to the public interest.

Thank you for the opportunity to comment.

Sincerely,



Albert H. Mirati, Jr.
Water Right Review Coordinator

c. WaterWatch of Oregon (public information request)
Fortune, Klamath Falls

FILE: G-13184.TEC



United States Department of the Interior



BUREAU OF RECLAMATION

MID-PACIFIC REGION

KLAMATH PROJECT

6600 WASHBURN WAY

KLAMATH FALLS, OREGON 97603-9365

IN REPLY
REFER TO:

CERTIFIED RETURN RECEIPT REQUESTED NOV 10 1993

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NOV 12 1993

WATER RESOURCES DEPT.
SALEM, OREGON

Oregon Water Resources Department
3850 Portland Road NE
Salem OR 97310

Subject: Protest of Application for Groundwater Use in the Bonanza, Oregon Area (Water Rights Protest)

We have recently become aware of Agenda Item E for the October 1, 1993, meeting of the Water Resources Commission. The information presented in this agenda item briefing indicates a strong possibility that a connection exists between groundwater and surface water supplies in the Bonanza, Oregon area. A follow-up conversation with Fred Listner, Oregon Department of Water Resources, indicated that a technical evaluation supporting the connection between groundwater and surface water will be forthcoming in the near future.

The U.S. Bureau of Reclamation (Reclamation) depends on the flows from Bonanza Springs to satisfy contractual agreements with Horsefly Irrigation District and to satisfy pre-project rights to the use of Lost River water. The Lost River watershed is over-appropriated and it has been the policy of Reclamation to protest all surface water applications that would require water use during the irrigation season. Accordingly, in January 1991, the Klamath Project requested the Water Resources Commission close the Lost River to further appropriations. To our knowledge, this was not acted upon by the Commission.

Until a method is developed by the State of Oregon to adequately determine the extent of depletion of the springs in the Bonanza area caused by groundwater pumping during the irrigation season, we must object to the granting of any non-domestic groundwater permits in the Bonanza area. As you are aware, any depletions would have to be replaced with stored water from Reclamation reservoirs located above Bonanza (Gerber and Clear Lake Reservoirs). Specifically, the following applications are being objected to:

Application Number	Name of Applicant	Address	Town	State
G 12768	DeJong, Elso & Arie	4771 Harpold Rd.	Bonanza	OR
G 13184	Balin Ranches	13600 Homedale Rd.	Klamath Falls	OR
G 13198	Gallup, Robert & Kelly	11234 W. Langell Valley Rd.	Bonanza	OR
G 13387	DeJong, William	6735 Bunn Rd.	Bonanza	OR

If you have any questions, please contact Jim Bryant at (503) 883-6935.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Ryan". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Michael J. Ryan
Project Manager

WaterWatch

O F O R E G O N

Hand Delivered

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JAN 12 1994

WATER RESOURCES DEPT
SALEM, OREGON

January 12, 1994

Oregon Water Resources Department
Water Rights Section
3850 Portland Road NE
Salem, Oregon 97310

Re: Objections to Technical Reports for:
G-13184, Balin Ranches, Irrigation, Klamath Co., Lost River
G-13219, Haught, Irrigation, Klamath Co., Lost River

Overview

The above referenced applications propose to use 6.04 cfs of ground water in the Lost River basin. This amount, when added to the over 37 earlier filed applications that have been proposed for issuance, bring the total amount of new groundwater use that have been proposed for approval of up to 159 cfs of ground water for irrigation use in the Lost River Basin (approximately 39 cfs is for primary irrigation use, approximately 44 cfs is for supplemental irrigation use and the remainder is for both primary and supplemental irrigation use). These applicants are likely looking to ground water as a source of water supply because existing surface water supplies whether from natural flow or Bureau of Reclamation (BOR) projects in the basin, are insufficient to meet irrigation needs. This surface water shortage is due, in part, to changes in reservoir operations made to protect habitat for Lost River and shortnose sucker species listed as endangered under both the federal and state Endangered Species Acts. The recent drought aggravated the existing water supply problems.

Unfortunately these applicants, there is growing evidence that the ground water resource is not capable of supporting **existing** ground water pumping, much less these proposed uses of water. The Water Resources Department's own analysis is that ground water pumping has exceeded the capacity of the ground water resource and that the pumping is having substantial effects on surface water flows in the Lost River. The Lost River system supports two endangered suckers and currently suffers from severe water quality problems. Any solution to these applicants' water supply problems **will not** come from ignoring existing water supply and environmental problems and issuing permits for these applications, whether temporary or permanent. The solution must come from increasing efficiencies in water use and achieving a better balance in water use in the basin. It is for these and other reasons that WaterWatch of Oregon and the Oregon Natural Resources Council (ONRC) submit these objections pursuant to OAR 690-11-170.

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The Ground Water Resource

Ground water in the Bonanza area is directly connected to the Lost River. WRC Agenda Item E, October 1, 1993 at 3 (hereinafter Agenda Item E). The most prominent ground water discharge is Bonanza Big Springs. Id. Ground water pumping from **already existing** permitted and exempt ground water uses in the area has been found to reduce Bonanza Springs discharges to the Lost River. Id. at 4. This and other applications propose to tap the very same aquifer that feeds the Lost River. See Id., and Memo to Water Rights Section from Groundwater/Hydrology Section, Subject Application G-13198, August 24, 1993. It is hard to imagine a clearer case of ground water/surface water interaction.

Existing ground water use has, at times, resulted in reversal of the hydraulic gradient of the aquifer flow such that the Lost River is actually drawn into the ground water through Bonanza Springs. Agenda Item E at 2. This has been identified by the Oregon Health Division as one of the causes of ground water contamination in the area. Id. See also Preliminary Assessment of Occurrence of Bacterial Contamination of Ground Water in Bonanza, Oregon, Nelson, Oregon Health Division at 2. This ground and surface water quality contamination problems is an **ongoing** chronic problems that has been aggravated in the past few years by the area wide drought. Oregon Department of Human Resources - Sanitary Survey Report, City of Bonanza.

The Surface Water Resource

Quantity

The flow in the Lost River arises from storage releases of BOR projects and groundwater discharges. Agenda Item E, at 3. The Lost River is overappropriated and "much of the flow of the Lost River is due to storage releases." Id. and Letter to Water Resources Department, from Bureau of Reclamation, 11/10/93. Concern over the overappropriated condition of the resource lead the Klamath Project to request that the Commission close the Lost River to further appropriations in January of 1991. Id. The Commission declined to initiate withdrawal proceedings in June of 1992. The Bureau of Reclamation has a policy of protesting all new surface water applications for use during the irrigation season because of concerns that further depletions of streamflows would have to be replaced with stored water. Id.

Quality

The Department of Environmental Quality (DEQ) has identified the Lost River from river mile 0 to 65 as water quality limited. See Oregon's 1992 Water Quality Status Assessment Report, 305(b) Report, A-79. From river mile 0 to river mile 5 the Lost River's water quality violates dissolved oxygen level standards. It is incapable of supporting the designated beneficial use of aquatic life during the summer months. This section of the river also violates water quality parameters for pH, nutrients and algae rendering only partially able to support the listed beneficial uses of aquatic life and aesthetics during the summer months. From river mile 5 to 65 (the segment containing Bonanza Springs) the water quality violations are year round for dissolved oxygen and fecal coliform parameters such that the

listed beneficial uses of aquatic life and water contact are not supported. Agricultural practices have been identified by DEQ as a possible cause of these water quality problems.

The Fish Resource

The Lost River supports two endangered suckers, the short nose and lost river suckers. The United States Fish and Wildlife Service (USFWS) Lost River (*Deltistes luxatus*) and Shortnose (*Chasmistes brevirostris*) Sucker Recovery Plan provides a good description of the history of these suckers:

Lost River and shortnose suckers are endemic to the upper Klamath Basin of Oregon and California (Map, page 11). Within their range, early records indicate that the Lost River and shortnose suckers were widespread and abundant. Cope (1884) noted that Upper Klamath Lake sustained "a great population of fishes" and was "more prolific in animal life" than any body of water known to him at that time. Gilbert (1898) noted that the Lost River sucker was "the most important food-fish of the Klamath Lake region." At that time, spring sucker runs "in incredible numbers" (Gilbert 1898) were relied upon as a food source by the Klamath and Modoc Indians and were taken by local settlers for both human consumption and livestock feed (Cope 1879, Coots 1965, Howe 1968). Sucker runs were so numerous that a cannery was established on the Lost River (Howe 1968) and several other commercial operations processed "enormous amounts" of suckers into oil, dried fish, and other products (Andreasen 1975).

Recovery Plan at 4. The decline of these suckers has been recognized since the mid-1960's, but the severity of the decline was not recognized until the 1980's. Recovery Plan Executive Summary.

In 1988 both species were listed under the federal Endangered Species Act as endangered. Executive summary. These species are also listed under the Oregon Endangered Species Act. By that time, entire stocks had already disappeared from sections of the Klamath Basin. Id. Both species of sucker are found in the Lost River. The Lost River and shortnose suckers are lake dwelling but spawn in tributary streams or springs. Recovery plan at 9, Executive Summary. Recent studies indicate that Bonanza Big Springs provides critical spawning habitat to at least some of these sucker populations. Recovery Plan at 9.

The USFWS has identified water diversion and water quality problems associated with agricultural practices as some of the causes of the decline of these species. Id. "Reduction and degradation of lake and stream habitat in the Upper Klamath Basin has been proposed by the (USFW) Service as the major factor in the decline of both species." Executive. Summ. The recovery actions identified by the USFWS in the recovery plan for the suckers include

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improving habitat conditions by, among other things, developing and achieving water quality and water quality goals, improving fish habitat and improving land management practices. Executive summary. To date, no streamflow goals have been established for suckers in the Lost River.¹

◆ **The Technical Reports are Defective.**

The technical reports fail to include many of the elements and evaluations required in OAR 690-11-160(1). The following are specific areas of deficiency:

- The reports fail to assess whether the proposed use are restricted by statute. OAR 690-11-160(1)(b).
- The reports fail to assess the proposed use with respect to conditions on other permits from the same source or the same type of use. OAR 690-11-160(1)(c).
- The reports fail to assess the uses with respect to **all** applicable administrative rules. OAR 690-11-160. For example, the reports do not assess these uses with respect to the applicable basin plan.
- The reports fail to evaluate potential conflicts with existing rights. OAR 690-11-160(1)(e). The information outlined in the section entitled CONFLICTS WITH OTHER WATER RIGHTS does not meet this requirement. The scope of the information is narrowly focused on other rights from the same point of diversion and for lands described in the applications. The rules are not that limited. The technical reports must evaluate the potential for conflict with existing rights -- rights that use the same **source** of water and rights that use other sources that may be affected by the proposed withdrawals.
- The reports fail to evaluate water availability from the proposed source pursuant to OAR 690-11-160(f).
- The reports do not evaluate whether the amounts requested is necessary to meet the proposed uses. OAR 690-11-160(1)(g).
- Finally, there is no evaluation of land use compatibility. OAR 690-11-160(1)(h).

¹ The Oregon Department of Fish and Wildlife has developed recommended flows for **trout** habitat. See attachment 1. However, these may not be appropriate for suckers needs.

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◆ **The Uses As Proposed are Not in the Public Interest.**

The proposed uses fail to pass the public interest considerations in ORS 537.525, 537.620 and 537.170 and the policies of Oregon's laws calling for the protection of native and anadromous fish, ORS 496.430 et sec. *See also*, OAR 690-11-195(3)(b), (d), (4)(a), (4)(b), (4)(c)(A), (4)(d), (4)(e), (4)(f). The State holds the waters from all sources of supply, in trust for the public. ORS 536.310(1), ORS 537.110, ORS 537.334(2), ORS 537.535, OAR 690-410-010(1) and OAR 690-410-070(1). Use of Oregon's ground water can generally only allowed by permit or certificate. The Ground Water Act of 1955 (ORS 537.505 to 537.795) requires the Commission to deny permit requests unless it can ensure that the "public welfare, safety and health" are protected. ORS 537.620. Thus, when evaluating the above referenced applications the Commission has a duty to ensure that the uses will not harm the quality of the ground and surface waters (*See* ORS 468B.015(1), 468B.015(2), (4) OAR 690-410-070(2)(e)), and instream flow needs for fish populations (ORS 496.430, OAR 690-410-070(2)(h)). *See also* OAR 690-11-195(4)(c), (d) and (h).

The state and federal Endangered Species Acts also place a burden on the Commission. Under the state Act, the Commission is required to consult with the Oregon Department of Fish and Wildlife to ensure that any action taken by the Commission is consistent with ODFW programs to conserve the species or, if no plan is in place, that the act will not "reduce the likelihood of the survival or recovery of the threatened species of endangered species." ORS 496.182(2). The federal Act prohibits the "taking" of endangered species. 16 USCA § 1538(a)(1)(B). Taking is defined in Section (3)(18) includes "harm" as well as killing and capturing. 16 USCA § 1532 (19). The regulatory definition of "harm" includes "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 CFR § 17.3. Thus it is clear that actions by the Commission can rise to the level of an unpermitted taking of a species if habitat destruction or modification harms a listed species. *See Palilia v. Hawaii Department of Land and Natural Resources*, 649 F.Supp. 1070 (D. Hawaii 1986), *aff'd*, 852 F.2d 1106 (9th Cir. 1988). Significantly, the above referenced *Palilia* case, the oft-cited case on habitat alteration rising to the level of take involved a state agency allowing goats to destroy the food source of an endangered bird. Taking water from fish is at least as clear a causal connection.

Listing under the state and federal endangered species act is a sign not only of the health of a particular species but also a warning signal for the health of the human environment. It has been a goal of Governor Roberts and the state not to allow resource conflicts to reach the level where federal intervention removes the state control. The proposed approval of this application will inevitably lead to these issues being resolved in Washington D.C. not in Oregon.

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1. The Water Availability Analyses are Defective

The analyses are defective for the following reasons:

- There is no analysis of surface water availability. The technical reports do not have any analysis of the status of water availability in the Lost River. Since the uses proposed will substantially interfere with Lost River flows, a surface water availability analysis is crucial to the water availability analysis for these ground water applications.

In addition, any such analysis must adequately consider rights-of-record. At any given moment there may be valid, but unexercised, water rights in a basin. Water users may at any time use the water to which they are legally entitled up to the limit of their rights-of-record. Failure to account for future increases in water use pursuant to rights-of-record results in an over-estimation of water availability and over-allocation of the resource. This is contrary to the statewide Water Allocation Policy. OAR 690-400-010.

- The analysis of groundwater availability appears to ignore existing and possible future uses of ground water that are exempt from Oregon's permitting requirements. We understand that there is no municipal water supply system in the City of Bonanza and most if not all residential uses of water in the City is diverted through exempt ground water wells. Thus, existing and future exempt wells have a cumulative impact on the resource and should be factored into the water availability analysis.

- The water availability analysis for surface flows in the Lost River must differentiate between natural flows and regulated flows (water released from upstream storage). Clearly, additional groundwater withdrawals will be interfering with stored water releases in the Lost River System, not just natural flows. See Letter to Water Resources Department from Bureau of Reclamation 11/10/93.

In addition, the flow releases from these federal projects are likely to be going through alterations in response to endangered species habitat concerns in the reservoirs. This will mean that flow regimes in the Lost River will be changing. If the proposed ground water use in these applications essentially draw from surface waters then the source may be essentially stored water. Failure to differentiate between natural flows and regulated flows in the analysis overestimates the amount of natural flow available for use, leads to unrealistic expectations on the part of these applicants and will result in the over-allocation of the resource. This is contrary to the statewide Water

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WATER RESOURCES DEPARTMENT
SALEM, OREGON

Allocation Policy. OAR 690-400-010. As a legal and policy matter, the Department must differentiate between stored water and natural flow in its water availability analysis for new permits and in its regulation of existing permits.

- The "analysis" that was done fails to take into account the overappropriated state of the river system and the flows needed to protect endangered fish populations in the Lost River. This is contrary to the statewide allocation and instream flow policies which require protection of instream flow needs when considering applications for out-of-stream uses. OAR 690-410-070(2) and 690-410-030.

2. **The proposed conditions are not sufficient to protect the public's interest in the resource.**

Temporary Permits

The technical reports propose to issue temporary permits for these proposed uses that will be renewed if certain conditions are met. WaterWatch and ONRC object to the use of temporary permits for the following reasons:

- The issuance of temporary permits does **nothing** to halt the further degradation of the resources in the Lost River. The fact that the water use is "temporary" ignores the fact that the resource, **without** this new use of water, is already in critical condition.
- The permit only requires this permittee to discontinue use if the use harms **existing senior** water right holders. There are no water rights, senior or otherwise, that protect instream values in this river system. Thus, these conditions do not allow the Commission to regulate the new permittee to protect instream values such as water quality or endangered species.
- There is no public notice or opportunity to comment on permit renewals.
- There are no clear standards for renewal. The condition allows renewal of the temporary permits if the surface flows are not "significantly diminished"; requires a "plan" for alternative long-term water supply; if ground water levels

JAN 12 1994

WATER RESOURCES DEPT.
SALMON, OREGON

have not "excessively declined"; and water level reports have been "timely submitted"².

Other Permit Conditions

In addition, the proposed permit conditions relating to measurement and reporting of water use would not be sufficient if by some stretch of the imagination these applications were in the public interest. In addition, proposed conditions #6 and #8 appear to be conflicting. Condition #6 requires measurement of water use and annual or more frequent reporting of use. Condition #8 requires measurement and limits reporting to an annual report to be filed by April 15 of each year. Any reporting condition should not limit the directors ability to require frequent (monthly or even daily) reporting of use.

- 3. The proposed uses are not in the public interest because they will deplete and adversely affect quantity and quality of water needed to meet the needs for endangered species uses of the Lost River.**

The proposed uses would deplete spring flows needed for endangered suckers in the Lost River. Adequate quantity and quality of water needed for migration and spawning are critical for the survival and restoration of sucker species in the basin. Reduced streamflows caused by depletion of springs by groundwater pumping contribute to higher water temperatures, reduced water quality and loss of aquatic habitat. Low flows impede passage and rearing in the mainstem Lost River. In addition, this water is proposed to be diverted for agricultural uses which have identified by DEQ as causing water quality problems. In addition, agricultural practices in the area have been identified by the USFWS as one of the causes of decline of the endangered suckers. The continued issuance of water use permits, whether temporary or permanent, in the face of the duty to protect critical habitat for threatened and endangered fish species, is contrary to the requirements of state and federal law.

- 4. The proposed uses are contrary to Oregon policy.**

ORS 537.170(5)(a) and (c) require the Department to ensure that waters in the basin will be used and controlled for all purposes, not just consumptive purposes. Instead of spending valuable state resources processing these applications, the state should be working to protect instream flows in this basin through the adoption of instream water rights. The Statewide Instream Flow Protection Policy states that "(w)here streamflows have been

² If temporary permits were issued, the permittee should be required to show that they complied with measurement and reporting requirements relating to water use **and** to periodic water level reports.

Water Resources Department

G-13184, G-13219

Page 9

JAN 12 1994

WATER RESOURCES DEPT
SEASIDE, OREGON

depleted to the point that public uses have been impaired, methods to restore the flows are to be developed and implemented." OAR 690-410-030(1). When considering applications for new water rights the agency is required to consider the needs of instream and out-of-stream uses and the need to develop streamflow restoration programs. OAR 690-410-030(2)(a). The Commission's review relating to instream needs is not limited to existing instream water rights or applications for water rights, it must also consider instream flow needs that are not specifically protected. OAR 690-410-070(2)(h). No such consideration has been done.

Instream water rights are an essential tool that must be utilized if Oregon is to achieve equitable allocation of water. Instream water rights not only protect unallocated waters instream, they serve as a management objective for obtaining the amount of instream flows needed to support public uses. OAR 690-77-015(2). The presence of endangered sucker populations in the Klamath River system makes the protection of instream flows even more important for achieving a balance in this basin. The establishment and protection of instream water rights will help to achieve a balanced allocation of water between public instream and other uses in the basin and throughout the state.

Establishment of the instream water right also furthers statewide policies, priorities and goals for streamflow restoration including those in OAR 690-11-030(1), 690-410-070, and 690-77-015. Protection of streamflows is also necessary in order to carry out the state policy of restoring native fish stocks. Oregon law states that "it is declared to be a goal of the people of the State of Oregon to restore native stocks of salmon and trout to their historic levels of abundance." ORS 496.435.

Oregon statutes and rules also call for the state to "aggressively promote" water conservation and places a high priority on eliminating waste and improving the efficiency of water use. ORS 537.460(2)(a) and OAR 690-410-060(1). Proposed condition #13 does little to further these policies. Given the critical status of fish populations in the basin, the water quality problems and the fact that these proposed uses are the type of use known to cause these existing problems, it is imperative that any use allowed be held to a strict efficiency standard **prior to** issuance of any new permit.

Oregon's statewide storage policy recognizes that storage is an "integral part" of the State's "strategy to enhance the public" benefits resulting from instream uses of Oregon's waters. OAR 690-410-080(1). The policy also recognizes that "(s)orage can provide increased water management flexibility and control." *Id.* One of the principles of the policy is to require that storage projects be managed in a way that will "protect and enhance the public health, safety and welfare, and the state's natural resources." OAR 690-410-080(2)(d). The Department's historic failure to manage stored water once it is released from storage and to distinguish between natural and regulated flows is not consistent with these policy mandates. Until the state begins to differentiate between natural and stored, and then begins to manage the resource consistent with that management strategy it will be ill-

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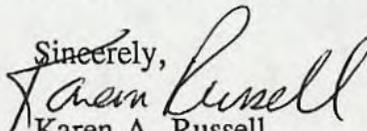
WATER RESOURCES DEPT
SALEM, OREGON

equipped to address the management and resource protection issues that it faces in the Klamath River Basin.³

Finally, the Commission's statewide policy on ground water management states that "(g)roundwater and surface water shall be managed conjunctively where to do so will protect the water resources, existing water rights, and the public interest." OAR 690-410-010(2)(a). The Policy also requires that "(i)nterference between groundwater uses and competing ground and surface water uses shall be prevented and/or controlled to protect the water resource and existing rights." OAR 690-410-010(1). The policy recognizes the state's duty to prevent ground water overdraft or contamination in order to avoid environmental damage. *Id.* For the reasons outlined above, the proposed issuance of these and other pending applications are not consistent with **any** of the parts of this statewide policy.

◆ **Conclusion**

In order to protect the public's interest in the resource, and the endangered fish species which rely on this resource, these and other applications for permits for water from the Lost River Basin should not be considered until sufficient instream flows are determined and guaranteed throughout the basin. Until these flows are determined and protected, the Department has no way to ensure that new uses proposed in the system will not harm the public interest. It is bad public policy to issue water rights based upon limited information when there is clearly a biological crisis in this critical river system.

Sincerely,

Karen A. Russell
Assistant Director
WaterWatch
Wendell Wood
ONRC

³ This failure also undermines efforts of the BOR and other federal agencies to obtain water needed for fish in the Lost River basin. The endangered suckers rely both on lakes and on stream and spring habitat. This means the BOR and the state will have to develop a management strategy for the suckers that protect certain reservoir levels **and** instream flows. Unless and until the Department differentiates between natural flow and stored water, the Department is creating yet another situation where a person who does not have a rights to use stored water is diverting ground water which affects stored water flows - potentially the stored water that the public is paying to have released into the river for fish needs. This is not only contrary to Oregon water law, it undermines the efforts of federal, state, and local governments, tribal governments and concerned citizens who have been working to protect one of Oregon's, and the nations, most precious resources.

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JAN 12 1994
WATER RESOURCES DEPT
SALEM, OREGON

Attachment 1

OREGON DEPARTMENT OF FISH & WILDLIFE
MINIMUM FLOW RECOMMENDATIONS FOR LOST RIVER

PERIOD	MERRILL	BONANZA	RM 64.0
January	30	25	15
February	30	30	15
March	30	30	15
April	50	35	20
May	50	35	20
June	50	35	20
July	20	10	10
August	15	10	5
September	15	10	5
October	15	10	5
November	15	10	5
December	20	15	10

Flow recommendations in cubic feet per second.
Estimates for Trout habitat.

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JAN - 7 1994

This Indenture Witnesseth, THAT OTTO BALIN, a single man,

WATER RESOURCES DEPT. SALEM, OREGON

65-33

hereinafter known as grantor for and in consideration of the sum of Ten and 00/100 Dollars to him paid, has bargained and sold, and by these presents does grant, bargain, sell and convey unto HAROLD E. BALIN,

his heirs and assigns, the following described premises, situated in Klamath County, Oregon, to-wit:

SE 1/4 of Sec. 11; SW 1/4 NW 1/4, W 1/2 SW 1/4, portion of SE 1/4 SW 1/4 lying North of Canal, in Sec. 12; Portion SE 1/4 SW 1/4 lying South of Canal, in Sec. 12; Beginning at Northwest corner of NW 1/4 NW 1/4 of Sec. 13; thence South along West line of said Section 13, 15 chains; thence E. 40 chains to a point 15 chains South of the Northeast corner of the NE 1/4 NW 1/4 of said Section 13; thence North 15 chains; thence West 40 chains to point of beginning, being 60 acres off North side of the N 1/2 NW 1/4 of said Section 13; also NW 1/4 NE 1/4 of Section 13, All in Township 40 South, Range 9 E.W.M.



Subject to: Contract and/or lien for irrigation and/or drainage; easements and rights of way of record and those apparent on the land, if any.

44-100



TO HAVE AND TO HOLD the said premises with their appurtenances unto the said grantee, his heirs and assigns forever. And the said grantor does hereby covenant to and with the said grantee, his heirs and assigns, that he is the owner in fee simple of said premises; that they are free from all incumbrances, except those above set forth, and that he will warrant and defend the same from all lawful claims whatsoever, except those above set forth.

IN WITNESS WHEREOF, He has hereunto set his hand and seal this 15th day of January 1965.

Handwritten signature of Otto Balin and three dotted lines for seals.

STATE OF OREGON, } ss County of Klamath }

BE IT REMEMBERED, That on this 18th day of January A. D. 1965, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared the within named Otto Balin, a single man,

who is known to me to be the identical person described in and who executed the within instrument, and acknowledged to me that he executed the same freely and voluntarily.

In TESTIMONY WHEREOF, I have hereunto set my hand and official seal the day and year last above written.

Notary seal for William Harvey, Notary Public for Oregon, My Commission Expires October 3, 1968. Includes a grid of 15 documentary stamps (3-cent each) and a large handwritten signature.

RECEIVED

JAN - 7 1994

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON; COUNTY OF KLAMATH; ss.

Filed for record at request of Oregon Title Ins. Co.
this 12 day of April A. D. 1965 at 3:59 o'clock P M., and
duly recorded in Vol. 360, of Deeds on Page 556

DOROTHY ROGERS, County Clerk

Fee 2.50

By Laura M. Lutton

557

Mrs. Gayle Gordon

44187

Vol. 1484 Page 21012

KNOW ALL MEN BY THESE PRESENTS, That LOYAL H. LOVENESS and MILDRED LOVENESS, husband and wife, and VINTON H. LOVENESS AND FERN LOVENESS, husband and wife, in consideration of

Ten and More

Dollars, RECEIVED

to them paid by OTTO BALIN, a single man,

JAN - 7 1994

do hereby grant, bargain, sell and convey unto said Otto Balin, his

WATER RESOURCES DEPT. SALEM, OREGON

heirs and assigns, all the following real property, with the tenements, hereditaments and appurtenances situated in the County of Klamath and State of Oregon, bounded and described as follows, to-wit:

NE 1/4, E 1/2 of W 1/2, N 1/2 SE 1/4 of Section 12, Township 41 South, Range 13 E., W.M.; SUBJECT To (1) Acreage and use limitations under provisions of the United States Statutes and regulations issued thereunder; (2) Easements and rights of way of record or apparent on the land; (3) Liens and assessments of Klamath Project and Langell Valley Irrigation District, and regulations, contracts, easements and water and irrigation rights in connection therewith; (4) reservation of a 100 foot strip of land in the NE 1/4 NW 1/4 of said Sec. 12, as disclosed in deed recorded July 23, 1924, in Deed Book 64, page 335, Records of Klamath County, Oregon; and (5) Reservations in deed recorded Jan. 5, 1929, in Deed Book 84, page 111, Records of said Klamath County; EXCEPTING and RESERVING unto the Grantors, their heirs, executors, administrators and assigns forever the right and easement to use the existing private road extending southwesterly through and across said land from the Langell Valley Road in NE 1/4 NW 1/4 of said Sec. 12 to lands now owned by Grantors lying West of the lands herewith conveyed so long as Grantors own such other land; and in the event Grantors sell or otherwise dispose of such other land, Grantee herein and his heirs and assigns agree to grant to the grantees of such other lands and to their heirs and assigns a perpetual easement 60 feet in width over and across the lands herein conveyed for road purposes from said Langell Valley Road to such other land, at a location to be selected by Grantee herein or his heirs or assigns. This agreement on the part of Grantee is intended as a reservation herein, and shall run with and enure to the benefit of such other lands owned by Grantors.

To Have and to Hold, the above described and granted premises unto the said Otto Balin,

his heirs and assigns forever.

And Grantors

the grantor

above named do covenant to and with the above named grantee, his heirs and assigns that they are lawfully seized in fee simple of the above granted premises, that the above granted premises are free from all encumbrances, except as above noted,

and that they will and their heirs, executors and administrators, shall warrant and forever defend the above granted premises, and every part and parcel thereof, against the lawful claims and demands of all persons whomsoever,

Witness our hands and seals this 18th day of March, 19 65.

Loyal H. Loveness (SEAL)

Mildred Loveness (SEAL)

Vinton H. Loveness (SEAL)

Fern Loveness (SEAL)

RECEIVED

STATE OF OREGON,

County of Klamath

ss.

JAN - 7 1994

21013

WATER RESOURCES DEPT.
SALEM, OREGON

BE IT REMEMBERED, That on this 7th day of May, 1965, before me, the undersigned, a Notary Public in and for said County and State, personally appeared the within named Loyal H. Loveness and Mildred Loveness, husband and wife, and Vinton H. Loveness and Fern Loveness, husband and wife, known to me to be the identical individual s described in and who executed the within instrument and acknowledged to me that they executed the same freely and voluntarily.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Wilbur O. Bricker

Notary Public for Oregon.

My Commission expires 10-29-67

WARRANTY DEED

(FORM No. 703)

STEVENS-NESS LAW PUB. CO., PORTLAND, ORE.

STATE OF OREGON,

ss.

County of Klamath

I certify that the within instrument was received for record on the 17th day of December 19 84, at 3:54 o'clock P M., on and recorded in book M84 on page 21012, Record of Deeds of said County.

Witness my hand and seal of said County affixed.



Evelyne Stebbins

By *F. Ann...* County Clerk-Recorder

Fee: \$9.00

WHEN RECORDED RETURN TO

Arsell Balin
13131 Homedale Rd.
Klamath Falls, Ore 97603

9 00 00

November 1, 1993

BALIN RANCHES
13600 HOMEDALE RD
KLAMATH FALLS, OR 97603

Reference: G 13184

Dear BALIN RANCHES,

Under separate cover I have enclosed our report of technical review. This process is fairly new to staff and has taken more time to complete than anticipated; however, we believe that the process is more fair and will allow staff to deal with issues in a more timely manner. I truly apologize for the delay.

The technical review reveals that your proposed uses of water is irrigation use on 600 acres. Prior to issuance of the permit, we will need to receive total fees in the amount of \$1480.00; being an examination fee of \$200.00, permit recording fee for the irrigation of 600 acres of \$ 1280.00. Since you have previously submitted \$ 200.00, an additional amount of \$ 1280.00 is required.

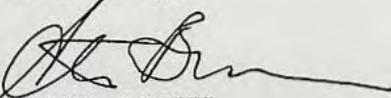
It will be necessary for you to submit a copy of your legal description. You can copy this from your deed. A signed statement certifying that the information you provided in your application is true and accurate is also needed.

A map prepared by a Certified Water Rights Examiner (CWRE) is required prior to permit issuance. A list of CWRE's is enclosed.

After submission of your legal description, oath statement, CWRE map, fees and the deadline for objections to the technical review expires, staff will again review the file for objections and further process your application as soon as possible.

Please feel free to contact me if you have any questions and I will be happy to address any concerns you may have.

Sincerely,



STEVE BROWN
Manager
Water Rights Division



TECHNICAL REVIEW CHECKLIST

FORM-71393

- (1) Application: G13184
- (2) Review Date: 9-17-93

S Indicates information was completed or adequately addressed.
 U Indicates information is needed, or incomplete, or inadequately addressed
 N/A Indicates Not Applicable

SUMMARY	
<u>U</u>	Completeness <i>oath, legal + fees</i>
<u>S</u>	Land Use <i>map, well logs</i>
<u>S</u>	GW Interference (if potential interference with surface water, see results of water availability analysis)
<u> </u>	Conflicts
<u>S</u>	Water Availability

(3) U The applicant has certified that the information provided in the application is an accurate representation of the proposed use and is true and correct to the best of their knowledge.

(4) N/A No oath is required because application was filed before June 5, 1992.

(5) Application fees:

Examination fee:	\$ 200	1
Recording fee:	\$ 1280	590
TOTAL REQUIRED	\$ 1480	2
TOTAL SUBMITTED	\$ 200	1180
AMOUNT DUE prior to issuance of permit	\$ 1280	
AMOUNT OVERPAID	\$	
refund due applicant	\$	

(6) Proposed dates of beginning and completion of construction, and complete application of water.

(7) U MAP: Prepared by a CWRE
 Exempt under OAR 690-11-150(3)
 A map or drawing included (non-CWRE)
 No map or drawing in file

- (8) N/A A CWRE map is not required for applications filed before November 9, 1987.
- (9) U A written copy of the legal description of the property on which the water is to be used.
- (10) NA A copy of written authorization, contract or easement permitting access to the land or reservoir not owned by the applicant.
- (11) S The proposed use is not restricted or prohibited by statute.
- (12) S The source of water is not withdrawn from appropriation by order of the State Engineer or Water Resources Commission, or legislatively withdrawn under ORS Chapter 538.
- (13) S irrig use(s) is/are classified uses(s) under the Klamath Basin Program, OAR 690-015 542.010-630.
- (14) The application, map and supporting data are complete and free of defects.

Land Use Compatibility:

- (15) As expressed by the Planning Department of Klamath
- (16) The land uses to be served by proposed water uses (including proposed construction) are allowed or are not regulated by the local comprehensive plan (ordinance section 54.070 A).
- (17) The land uses to be served by proposed water uses (including proposed construction) involve discretionary land use approvals which have been obtained.
- (18) The local government was notified, and sent no comment pursuant to the rules at the time; land use was presumed in compliance per such statement printed on the application.

For ground water applications:

- (20) U A copy of the constructor's log, if available, for any well already constructed, or required information regarding actual or anticipated construction.
- (21) S The report from groundwater section has been received.

For reservoir applications:

- (22) Plans, specifications and supporting information for the dam and impoundment area.

WaterWatch

O F O R E G O N

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DEC - 8 1992

WATER RESOURCES DEPT.
SALEM, OREGON

December 1, 1992

Water Resources Department
3850 Portland Rd. N. E.
Salem, OR 97310

RE: Application for Permit #G13184, Balin Ranches
Lost R. Basin, Klamath Co., Irrigation

WaterWatch has reviewed the limited amount of information contained in the public notice of this water right application. Based upon that information, WaterWatch raises the following issues, questions and concerns:

Is there unappropriated water available for this proposed use? How will the Department determine water availability for this proposed use? What will be the cumulative effect of this proposed use, in combination with other, already existing uses of the aquifer?

Is the groundwater source in question in hydraulic connection with surrounding surface waters? If so, what is the amount of surface water depletion and what effect will this proposed use have on instream flows necessary to protect the public's interest in fish, wildlife, recreation and a health aquatic system? We oppose any application which in any way reduces surface water flows needed for the public uses that are served by any instream water right.

Given the importance of this groundwater resource, and the Department's limited enforcement staff, it only makes sense to require this applicant to measure and record water use. Measurement not only helps the Department carry out its statutory mandate to promote the control of water resources in Oregon for all beneficial uses, it helps the Department protect the public's interest in assuring the use is within the bounds of the permit. ORS 536.220(1)(a), 537.170(5)

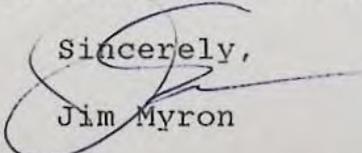
Will this proposed use be compatible with Goal 5 elements in the local comprehensive plan?

It is a high priority of the state to eliminate waste and improve the efficiency of water use. OAR 690-410-060(1) Statewide policy also calls upon water users to use and maintain their water systems in a manner consistent with the state's priority. What conditions are proposed for this permit that will carry out and encourage compliance with state policy?

Is this an existing illegal use of water? If so, will the continued use without a permit cause harm to existing water rights and the public interest?

We request copies of the draft permit and the Department's technical analysis of this application.

Sincerely,


Jim Myron

bc:

November 24, 1992

BALIN RANCHES
13600 HOMEDALE RD
KLAMATH FALLS, OR 97603

REFERENCE: File(s) G-13184

We received your application(s) proposing to use water, along with supporting data and fees. Your receipt is enclosed unless you received it earlier. The application has been assigned the above referenced file number and will be reviewed in detail as time allows. If you need to call or write to us, be sure to reference the file number(s) listed above so we may assist you promptly.

Applications which are received in proper form with required maps, supporting data and fees can be considered for approval by issuance of permits following a mandatory 60-day waiting period and after public interest matters are resolved.

Processing of applications which require additional information will be delayed further. If you feel that a delay in the processing of your application will cause a hardship, please advise in writing.

If the application is approved, the use allowed by the permit will be subject to the Water Resources Commission's Basin Program statements, instream flow requirements, and demands of prior rights.

If you have any questions, please contact the Water Right Section at the telephone number referenced below.

cc: CWRE

DRAFT

STATE OF OREGON

COUNTY OF KLAMATH

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

BALIN RANCHES
13600 HOMEDALE ROAD
KLAMATH FALLS, OREGON 97603

503-882-9797
503-884-2452

to use the waters of A WELL in the LOST RIVER BASIN for SUPPLEMENTAL IRRIGATION OF 600 ACRES.

This permit is issued approving Application G-13184. The date of priority is NOVEMBER 13, 1992. The use is limited to not more than 2000 GALLONS PER MINUTE, or its equivalent in case of rotation, measured at the well.

The well is located as follows:

NE 1/4 SW 1/4, SECTION 12, T 41 S, R 13 E, W.M.

The amount of water used for irrigation under this right, together with the amount secured under any other right existing for the same lands, is limited to a diversion of ONE-EIGHTIETH of one cubic foot per second (or its equivalent) and 3.0 acre-feet for each acre irrigated during the irrigation season of each year.

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

A description of the proposed place of use under this permit is as follows:

IRRIGATION OF 600 ACRES

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times. When required by the department, the permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Actual construction work shall begin on or before , and shall be completed on or before October 1, 1994. Complete application of the water shall be made on or before October 1, 1995.

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

DRAFT

PAGE TWO

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water shall be limited when it interferes with any prior surface or ground water rights.

Issued this date, .

Water Resources Department
Martha O. Pagel
Director

Application No. 6-13184 **START CARD**
 Permit No. **NOTICE OF BEGINNING OF WELL CONSTRUCTION**
 (as required by ORS 537.76)

This form must be completed, signed by both the owner (or authorized agent) and constructor, and the original mailed or delivered to the Water Resources Department, 3850 Portland Road NE, Salem, OR 97310, no later than the day construction, alteration, conversion or abandonment work begins. A \$75 fee shall accompany notices for new well construction or conversion of an existing hole not previously used as a water well (make checks payable to the Water Resources Department). Notices meeting this requirement but received without the required fee will not be properly and timely filed. The Water Resources Commission has authority to impose civil penalties for failure to submit the required \$75 fee with the start card and for failure to submit cards prior to beginning any construction, alteration, conversion or abandonment work.

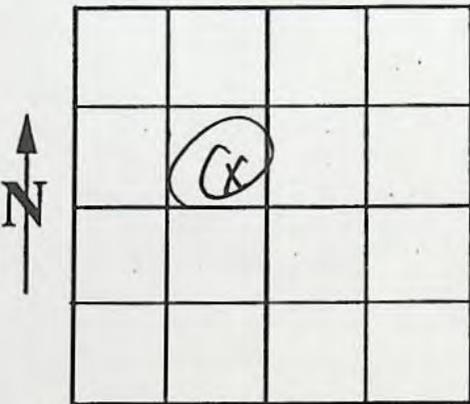
Owner's name and mailing address BALIN RANCHES
13600 HOME OAK RD.
KLAMATH FALLS, OREGON 97603

Check type of work: Fee Required New construction Conversion
 No Fee Required Repair Deepening Recondition Abandonment

Proposed Commencement Date Nov '92 Existing or Proposed Well Depth 400 Diameter 16

Check Use: Domestic Community Industrial Irrigation Monitoring
 Thermal Injection Other _____

Proposed Well Location: County KLAMATH Owner's Well Id. No. # 2
 Township 41S (N or S) Range 13E (E or W) Section 12



- SE 1/4 of NW 1/4 of above section
- Street address of well location WEST LANGER VALLEY RD
LORENA, OREGON
- Tax lot number of well location 02500
- Attach map with location identified.
(See reverse of this form for approved maps)
- Show well location within 1/4, 1/4 of section grid at left.

We hereby certify that we have read the back of this form, and that to the best of our knowledge the information provided herein is accurate and the well is being properly located from septic tanks, septic drain fields and other hazards. (See #2 on back)

[Signature]
 Owner's signature
K. Owen
 Title
9/30/92
 Date

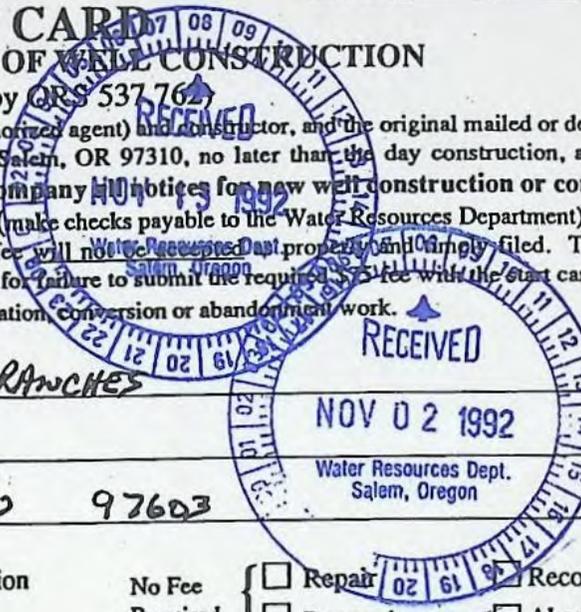
 Home phone

 Work phone

[Signature]
 Bonded Water Well Constructor
 License No. 601
 Company STONEY DRAINAGE SERVICES

NOTE: This is not a water right application. The owner is responsible for obtaining a water right through the Water Resources Department, if required.

THIS COPY TO WATER RESOURCES DEPARTMENT IN SALEM
 If no fee applies, discard this copy



COPY
 RECEIVED
 OCT - 2 1992
 WATER RESOURCES DEPT.
 SALEM, OREGON

Application No. 6-13184
Permit No.

FAX COVER SHEET



Date: Nov. 16 1992

This fax is directed to: Dave (Oregon Water Resource Dept.)
Please notify this person that they have been sent a fax.

URGENT: Yes No
Department: OWRD Well Permit

Company: _____

Business Phone: _____ FAX Phone: 378-8130

Number of Pages including this cover sheet: 2

Special Instructions: _____

FEES:
1st Sheet \$3.00
Each Additional Sheet \$1.00
Receiving \$1.00

This Fax has been sent by: Scott Balin

Department: _____

Company: Balin Ranches

Phone: 882-9797

TOTAL _____
PAID _____

Balin's TOWER DRUG & GIFTS Public FAX Service
Please call us if you have any problems receiving or if there are any pages missing.
We can receive and transmit FAX's 9:00am to 5:00pm 6 days a week.

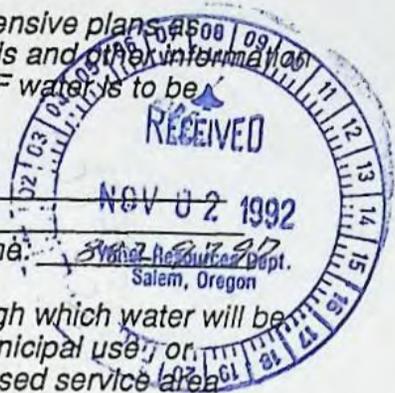
Balin's TOWER DRUG & GIFTS
1791 Washburn Way
Klamath Falls, OR 97603
Phone: (503)-884-1347 FAX: (503)-884-2019

Application No. G-13184
Permit No.

Land Use Information Form: Permits, Hydroelectric Licenses, Water Uses in Addition to Classified Uses

This information is needed to determine compatibility with local comprehensive plans required by ORS 197.180. The Water Resources Department will use this and other information to evaluate the water use application. DO NOT FILL OUT THIS FORM IF water is to be diverted, conveyed, and/or used only on federal lands.

Applicant's Name: Balin Ranch
 Address: 13600 Humedale Rd
 City: Klamath Falls State: OR Zip: 97603 Day Phone: _____



Please provide information as requested below for all tax lots on or through which water will be diverted or used. (Attach extra sheets as necessary.) Applicants for municipal use, or irrigation uses within irrigation districts, may substitute existing and proposed service area boundaries for the tax lot information requested below.

Tax Lot or Local I.D.#	Plan Designation/Zoning (e.g. Rural Residential/RR-5)	Check All That Apply		
		Water Diverted	Water Conveyed	Water Use
4113-0000-02500	<u>Agricultural Use/EFU-CG</u>			X

Please list all counties and cities within which water is proposed to be diverted, conveyed and/or used. Klamath County
 The following section must be completed by a planning official from each county and city listed unless your project will be located entirely within city limits. In this case, only the city planning agency must complete this form. Please request extra forms as needed.



For Local Government Use Only

Local government planning officials are to complete the remainder of this form. If this form cannot be completed while the applicant waits, please sign and detach the receipt as instructed below. Please mail the completed form directly to the Water Resources Department (3850 Portland Rd. NE, Salem, OR, 97310) within 60 days of the date of receipt as shown below. If the form is not completed within 60 days, the Department may take action to approve the water use.

a) Check the appropriate box below and provide requested information.

- Land uses to be served by proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): Section 54.020 A - Klamath Go to section b) on reverse side.
County Land Development Code.
- Land uses to be served by proposed water uses (including proposed construction) involve discretionary land use approvals as listed in the table below. **Note: Please attach documentation of applicable local land use approvals which have already been obtained. (Record of Action plus any accompanying findings is sufficient.)**

Type of Land Use Approvals Needed (e.g.: plan amendments, rezones, conditional use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Please check the box that applies:		
		Already Obtained	Already Denied	Being Pursued Satisfactorily
<u>N/A.</u>				

(over)

Receipt for Request for Land Use Information

WRD Applicant Name: _____

This receipt must be signed by a local government representative and returned to the applicant for inclusion in the WRD application IF the local government can not provide the above requested land use information while the applicant waits.

City or County: _____

Staff Contact: _____ Phone: _____

Signature: _____ Date of Information Request: _____

(For Local Use Continued)

b) Please provide printed name and written signature.

Name: Karen Bung

Title: Admin. Secretary

Date: 10-29-92

Phone: 888-4200

Signature: Karen Bung

Local governments are invited to express special land use concerns or make recommendations to the Department regarding this proposed use of water below, or on a separate sheet. For additional information call Roberta Jortner or Rick Bastasch at 378-3671.

Additional Comments:

Lined area for additional comments with approximately 25 horizontal lines.

Description of Water Use

Note to Applicant: This sheet will provide local planning staff with a basic description of your proposed water use. Please fill out this sheet before bringing the attached land use form to your local planning office. It will help local planning offices complete your land use information form quickly.

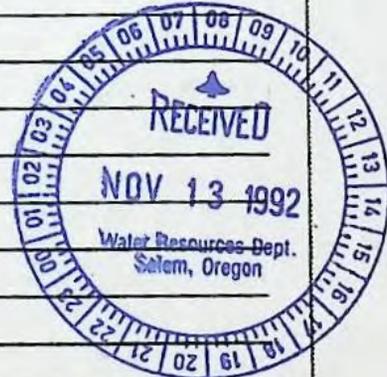
Note to Local Planning Officials: Please initial this sheet. Do not separate it from the land use information form. If needed, please make a separate copy for your records.

Applicant Name: Balin Ranch
 Address: 13600 Homedale Rd
Klamath Falls OR 97603
 Phone: 882 9797



Please indicate what you will use the water for. Check all boxes that apply and fill in the blanks with key characteristics of the project

- Irrigation (crop type, golf course, nursery or greenhouse): Livestock Pasture
- Livestock (type of livestock, feedlot, slaughterhouse): _____
- Residential (# units, single or multi-family, # lots if partition or subdivision): _____
- Commercial (i.e., retail, office, restaurant, gas station, hotel, service, etc.): _____
- Industrial (i.e., factory, pulp mill, research and development, processing, etc.): _____
- Institutional (i.e., school, library, etc.): _____
- Mining (aggregate, metal, open pit, placer, etc.): _____
- Recreation (park, campsite, pond, etc.): _____
- Fish and Wildlife (pond, hatchery, etc.): _____
- Hydropower (dam, reservoir, power generating or transmitting facilities): _____
- Other (Name and list key characteristics): _____



Indicate sources for the proposed water use below:	Indicate the estimated quantity of water the use will require.
<input type="checkbox"/> Surface Water Name sources: _____ _____ _____	_____ Cubic feet per second. <u>2,000</u> Gallons per minute. _____ Acre-Feet
<input type="checkbox"/> Reservoir or pond	
<input checked="" type="checkbox"/> Ground Water	

9-13184

Oregon

WATER
RESOURCES
DEPARTMENT

November 3, 1992

Balin Ranches
13600 Homedale Rd.
Klamath Falls, OR 97603

We have reviewed an application to use water. We need additional information so we can accept, review and decide if an application may be approved.

Please provide the following:

A map containing the Township, Range, Sections and Quarter, Quarter of the property applied for.

A legal description of the property where you plan to use water. You can copy this from your deed, title insurance policy or sales contract.

Land-use information signed by the County. (required before we can accept the application, a form is enclosed)

An oath that the information contained in the application is a true and accurate representation of the proposed water use.

Total fees in the amount of \$.

Other: The application, supporting data and check no. 9516 in the amount of \$200.00 is being returned.

We will complete our analysis when the application and information noted above is received.

Contact the Application/Permits Section at 378-3739 if you have any questions.

Enclosures
H. Joseph Mouton

Joel/HJM

cc: CWRE



3850 Portland Rd NE
Salem, OR 97310
(503) 378-3739
FAX (503) 378-8130



BALIN RANCHES
 13600 HOMEDALE RD.
 KLAMATH FALLS, OR 97603
 PH. 882-9797 884-2452

UNITED STATES NATIONAL BANK OF OREGON
 TOWN & COUNTRY BRANCH
 KLAMATH FALLS, OREGON 97602
 24-22-1230

9516

DATE
 30 Oct 92

AMOUNT
 200.00

200Dollars and ***00cents

PAY
 TO THE
 ORDER
 OF

OREGON WATER RESOURCES DEPT.
 3850 Portland Rd. NE
 Salem, OR 97310

AUTHORIZED SIGNATURE

*West LVR
 Well Permit
 Start # 39427*



Records have been redacted or withheld pursuant to the exemption for financial transfer records specified in ORS 192.345(27).

**STATE OF OREGON
WATER RESOURCES DEPARTMENT**

3850 PORTLAND ROAD NE
SALEM, OR 97310
378-8455 / 378-8130 (FAX)

RECEIPT # **108587**

RECEIVED FROM: Rubin Ranches
BY: _____

APPLICATION	G-13784
PERMIT	
TRANSFER	

CASH: CHECK: # 24-22 OTHER: (IDENTIFY)

TOTAL REC'D \$ 1226.00

01-00-0 WRD MISC CASH ACCT

842.010	ADJUDICATIONS	\$
831.087	PUBLICATIONS / MAPS	\$
830.650	PARKING FEES Name / month	\$
_____	OTHER: (IDENTIFY)	\$

REDUCTION OF EXPENSE

CASH ACCT. \$
VOUCHER # _____

COST CENTER AND OBJECT CLASS

03-00-0 WRD OPERATING ACCT

MISCELLANEOUS:

840.001	COPY FEES	\$
850.200	RESEARCH FEEDS	\$
880.109	MISC REVENUE: (IDENTIFY)	\$
520.000	OTHER (P-6) (IDENTIFY)	\$

WATER RIGHTS:

842.001	SURFACE WATER	\$	842.002	\$
842.003	GROUND WATER	\$	842.004	\$ <u>1226.00</u>
842.005	TRANSFER	\$	842.006	\$

WELL CONSTRUCTION

842.022	WELL DRILL CONSTRUCTOR	\$	842.023	\$
_____	LANDOWNER'S PERMIT	\$	842.024	\$
_____	OTHER (IDENTIFY)	\$		

06-00-0 WELL CONST START FEE

842.013	WELL CONST START FEE	\$	CARD #	
_____	MONITORING WELLS	\$	CARD #	

45-00-0 LOTTERY PROCEEDS

864.000	LOTTERY PROCEEDS	\$
---------	------------------	----

07-00-0 HYDRO ACTIVITY

842.011	POWER LICENSE FEE (FW/WRD)	\$
842.115	HYDRO LICENSE FEE (FW/WRD)	\$
_____	HYDRO APPLICATION	\$

RECEIPT # **108587** DATED: 1/27/04 BY: Ray Engel

NUMBER 88864

Check 200⁰⁰ NO _____ Cash _____

____ Surface Application

____ Reservoir Application

Ground Water Application

____ Transfer Application

____ Power Claim

____ Hydroelectric Examination

____ Hydroelectric License

____ Copying

____ Assignment

____ Extension of Time

____ Other

____ P-6

____ Quadrangle

____ Basin

____ Protest

____ Constructors Examination

____ Constructors License

____ Adjudication

200.⁰⁰

To:
Marco

NUMBER

95733

Check 1226⁰⁰ NO Cash

 Surface Application

 Reservoir Application

Ground Water Application

0
1224

 Transfer Application

 Power Claim

 Hydroelectric Examination

 Hydroelectric License

 Copying

 Assignment

 Extension of Time

 Other

 P-6

 Quadrangle

 Basin

 Protest

 Constructors Examination

 Constructors License

 Adjudication

Ref'd

Application No. 6-13184
Permit No.

STATE OF OREGON
WATER RESOURCES DEPARTMENT
3850 PORTLAND ROAD NE
SALEM, OR 97310
378-8455/378-8130 (FAX)

92560

copy

RECEIVED FROM: <u>Babin Ranches</u>	APPLICATION
BY: _____	PERMIT
	TRANSFER

CASH: CHECK: # 2422 OTHER: (IDENTIFY) _____

TOTAL REC'D \$ 75



01-00-0 WRD MISC CASH ACCT		
842.010	ADJUDICATIONS	\$
831.087	PUBLICATIONS/MAPS	\$
830.650	PARKING FEES Name/month	\$
	OTHER: (IDENTIFY)	\$

02-00-0 FEDERAL FUNDS		
	OTHER: (IDENTIFY)	\$

03-00-0 WRD OPERATING ACCT				
MISCELLANEOUS:				
840.001	COPY FEES			\$
850.200	RESEARCH FEES			\$
880.109	MISC REVENUE: (IDENTIFY)			\$
520.000	OTHER (P-6): (IDENTIFY)			\$
WATER RIGHTS:				
842.001	SURFACE WATER	EXAM FEE	842.002	RECORD FEE
842.003	GROUND WATER	\$	842.004	\$
842.005	TRANSFER	\$	842.006	\$
WELL CONSTRUCTION				
842.022	WELL DRILL CONSTRUCTOR	EXAM FEE	842.023	LICENSE FEE
842.016	WELL DRILL OPERATOR	\$	842.019	\$
	LANDOWNER'S PERMIT	\$	842.024	\$

06-00-0 WELL CONST START FEE			
842.013	WELL CONST START FEE	\$ <u>75</u>	CARD # <u>39927</u>
	MONITORING WELLS	\$	CARD #

45-00-0 LOTTERY PROCEEDS		
864.000	LOTTERY PROCEEDS	\$

07-00-0 HYDRO ACTIVITY		LIC NUMBER	
842.011	POWER LICENSE FEE(FW/WRD)		\$
842.115	HYDRO LICENSE FEE(FW/WRD)		\$
	HYDRO APPLICATION		\$

RECEIPT # **92560** DATED: 10-2-92 BY: SW

Distribution—White Copy-Customer, Yellow Copy-Fiscal, Copy-Fiscal

**STATE OF OREGON
WATER RESOURCES DEPARTMENT**

RECEIPT # **125154**

158 12TH ST. N.E.
SALEM, OR 97310-0210
378-8455 / 378-8130 (FAX)

INVOICE # _____

RECEIVED FROM: WW
BY: _____

APPLICATION	1312972
PERMIT	
TRANSFER	

CASH: CHECK: # 42412 OTHER: (IDENTIFY)

TOTAL REC'D \$ 775.00

01-00-0 WRD MISC CASH ACCT

842.010	ADJUDICATIONS	\$
831.087	PUBLICATIONS / MAPS	\$
830.650	PARKING FEES Name / month	\$
_____	OTHER: (IDENTIFY)	\$

REDUCTION OF EXPENSE

_____	CASH ACCT.	\$
_____	VOUCHER #	

03-00-0 WRD OPERATING ACCT

MISCELLANEOUS		
840.001	COPY FEES	\$
850.200	RESEARCH FEES	\$
880.109	MISC REVENUE: (IDENTIFY)	\$
520.000	OTHER (P-6) (IDENTIFY)	\$

**RECEIVED
OVER THE COUNTER**

WATER RIGHTS:		EXAM FEE		RECORD FEE
842.001	SURFACE WATER	\$	842.002	\$
842.003	GROUND WATER	\$	842.004	\$
842.005	TRANSFER	\$	842.006	\$
WELL CONSTRUCTION		EXAM FEE		LICENSE FEE
842.022	WELL DRILL CONSTRUCTOR	\$	842.023	\$
_____	LANDOWNER'S PERMIT		842.024	\$

842.022 OTHER (IDENTIFY) Protect for 425-5-023001 \$25.00

06-00-0 WELL CONST. START FEE

842.013	WELL CONST START FEE	\$	CARD #	
_____	MONITORING WELLS	\$	CARD #	
_____	OTHER (IDENTIFY)			

45-00-0 LOTTERY PROCEEDS

864.000	LOTTERY PROCEEDS	\$
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07-00-0 HYDRO ACTIVITY

842.011	POWER LICENSE FEE (FW/WRD)	LIC NUMBER	\$
842.115	HYDRO LICENSE FEE (FW/WRD)		\$
_____	HYDRO APPLICATION		\$

RECEIPT # **125154**

DATED: 6/1/01

BY: [Signature]

**STATE OF OREGON
WATER RESOURCES DEPARTMENT**

RECEIPT # **125153**

158 12TH ST. N.E.
SALEM, OR 97310-0210
378-8455 / 378-8130 (FAX)

INVOICE # _____

RECEIVED FROM: WW
BY: _____

APPLICATION	<u>6-13184</u>
PERMIT	
TRANSFER	

CASH: CHECK: # 2412 OTHER: (IDENTIFY)

TOTAL REC'D \$ 775.00

01-00-0 WRD MISC CASH ACCT

842.010	ADJUDICATIONS	\$
831.087	PUBLICATIONS / MAPS	\$
830.650	PARKING FEES Name / month	\$
_____	OTHER: (IDENTIFY)	\$

REDUCTION OF EXPENSE

CASH ACCT. \$ _____
VOUCHER # _____

COST CENTER AND OBJECT CLASS

03-00-0 WRD OPERATING ACCT

840.001	MISCELLANEOUS COPY FEES	\$
850.200	RESEARCH FEES	\$
880.109	MISC REVENUE: (IDENTIFY)	\$
520.000	OTHER (P-6) (IDENTIFY)	\$

**REC'D
OVER THE COUNTER**

842.001	WATER RIGHTS: SURFACE WATER	EXAM FEE \$	842.002	RECORD FEE \$
842.003	GROUND WATER	\$	842.004	\$
842.005	TRANSFER	\$	842.006	\$
842.022	WELL CONSTRUCTION WELL DRILL CONSTRUCTOR	EXAM FEE \$	842.023	LICENSE FEE \$
_____	LANDOWNER'S PERMIT		842.024	\$

340.031 OTHER (IDENTIFY) paid for 425-5-06230001 825.00

06-00-0 WELL CONST. START FEE

842.013	WELL CONST START FEE	\$	CARD #	
_____	MONITORING WELLS	\$	CARD #	
_____	OTHER (IDENTIFY)			

45-00-0 LOTTERY PROCEEDS

864.000	LOTTERY PROCEEDS	\$
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07-00-0 HYDRO ACTIVITY

842.011	POWER LICENSE FEE (FW/WRD)	LIC NUMBER	\$
842.115	HYDRO LICENSE FEE (FW/WRD)		\$
_____	HYDRO APPLICATION		\$

RECEIPT # **125153**

DATED: 6/2/91

BY: [Signature]

2001

Oregon Water Resources Department
 October 2001 through September 2002
 Annual Water Use - Monthly Quantities Form

USER-ID 27627 29105

2002



29495

Facility <input type="checkbox"/> POD-ID <input type="checkbox"/>	SLR Permit #14005	LVR Art. Cont #76624 Permit #611430	LVR-S Permit #612454	LVR-W Permit #36962 6-12463	-aid 27627
October - 2001	338 AcFt	206 AcFt	0	489	
November - 2001	334 AcFt	- 0 -	- 0 -	- 0 -	
December - 2001	- 0 -	- 0 -	- 0 -	- 0 -	
January - 2002					
February - 2002					
March - 2002					
April - 2002					
May - 2002					
June - 2002					
July - 2002					
August - 2002					
September - 2002	- 0 -	- 0 -	- 0 -	- 0 -	
TOTAL *	668 AcFt	206 AcFt	0	489 AcFt	

RECEIVED
 NOV 04 2002
 WATER RESOURCES DEPT
 SALEM, OREGON

* Describe the units of measure as G (gallons), KG (thousand gallons), MG (million gallons), CF (cubic feet), MCF (million cubic feet), or AF (acre-feet)

Describe method of measuring the water used: meter. If use is irrigation, total number acres irrigated _____

I certify this information is true and accurate to the best of my knowledge.

Hal Belin Trustee Belin Ranch 10-30-02
 Signature Title Reporting Entity Date

Hal Belin
Name - Please Print

Please complete and mail to: Water Resources Department; Water Use Reporting Program;
158 12th Street NE; Salem, OR 97310-0210



OREGON WATER RESOURCES DEPARTMENT SUMMARY OF WATER RIGHTS FOR WATER USE REPORT



Dear Water User: It is a new water year! All water use reports for October 2001 to September 2002 are requested to be submitted by January 1, 2003. This information is important for water management in Oregon. Please complete the form on the reverse side for the water rights listed below. If you have questions, or need more time please, contact me at 503-378-8455 ext. 333. Thank you for your attention to this matter. Mary Graine

SCOTT BALIN USER-ID 27627
BALIN RANCH
13600 HOMEDALE RD
KLAMATH FALLS OR 97603

POD-ID	FACILITY	CERT	PERMIT	APPL	PRIORITY	USE	L/S	TWP	RANGE	SEC	Q/Q	RATE	SOURCE	TRIBUTARY TO								
36954		0	G	12458	G	12972	12/23/1992	IC	L	41	S	14	E	18	SEW	3.5	C	A	A	WELL	LOST	R
36954		0	G	12458	G	12972	6/5/1992	IC	L	41	S	14	E	18	SEW	3.5	C	C	A	WELL	LOST	R
36962		0	G	12463	G	13184	11/13/1992	IC	L	41	S	13	E	12	NEW	4.46	C	C	A	WELL	LOST	R
36962		0	G	12463	G	13184	1/7/1994	IC	L	41	S	13	E	12	NEW	2.701	C	C	A	WELL	LOST	R