Oregon
Kate Brown, Governor

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MEMORANDUM

TO: Water Resources Commission

FROM: Thomas M. Byler, Director

SUBJECT: Agenda Item D, December 3, 2021
Water Resources Commission Meeting

Director's Report

I. Current Events and Updates

A. Staffing Update

Since the August Commission meeting, the Department has hired fourteen positions. There were three transfers in from another state agency, three promotions, and eight new to the state employees. The positions filled include five Regional Assistant Watermasters, one Assistant Watermaster, one Hydrogeologist, two limited duration Protest Specialists, an HR Business Partner, and one Executive Assistant and Public Records Support position. Promotions include two Hydrographers and one Surface Water Hydrology Manager.

B. Reopening State Offices and Reimagining the Workplace

During the COVID-19 pandemic, almost all state agencies have continued to operate and provide services with their offices closed to unplanned visits by the public. Earlier this summer, the state targeted September 1 as the date to "reopen" its doors to receive unplanned visitors. A spike in COVID-19 cases caused the state to delay that reopening date. The current planned date for reopening is now January 2, 2022.

Earlier this year, the Department of Administrative Services (DAS) created the Reopening Advisory Team made up of agency, human resources, and program area advisors throughout the enterprise. This group developed a report on reopening state government buildings to the public. The report contains elements that provide high level guidance for reopening offices, as well as recommendations to assist state agencies as they develop their post-COVID work model. The group's main areas of focus included topics related to public access, workforce re-entry, discussions on hybrid telecommuting, in-office staff, information technology needs, workspace, facilities, parking, human resource policies, and much more. Overall, DAS is supportive of continuing a hybrid workplace approach within the state enterprise and encourages working remotely when it benefits both the employee and the agency (DAS State HR Policy 50.050.01).

The Department is committed to reimagine how and where the work of the agency occurs while maintaining high standards for staff and program productivity. Since March of 2020, the impacts of the pandemic have offered many lessons about how effective and productive agency staff can be while working remotely.

We also heard from many staff who would like to retain the ability to work remotely; of 118 staff surveys, 73% indicated they are interested in continuing to work remotely to some degree. With this in mind, we recognize the Department's future workplace will not function like it did prior to or during the pandemic, and we are committed to maintaining or improving our level of service.

The Department has formed a staff Work Reimagined Team which is developing recommendations to the agency executive and management teams on steps the Department can take to support and create a modern work environment that involves both in-person and remote work arrangements which best meet our business and employee needs. This effort will take a number of months to develop and implement. For purposes of the January 2 reopening timeline, the Department will be prepared to assist persons who make unscheduled visits to our offices. The broader Department Work Reimagined effort is expected to be implemented over a longer period of time during 2022 and may include recommendations for future projects.

C. Water Core Team Update

The Water Core Team was formed by the Governor's Office and state natural resources agency Directors to better communicate and coordinate actions among agencies with water-related responsibilities. The team meets twice a month to facilitate timely and efficient cross-agency coordination and communication on urgent, emergent, long-term, and strategic water issues. Team participants include agency Deputy Directors and/or their designees. Deputy Director Doug Woodcock, who serves as co-chair, and Kim Fritz-Ogren, Manager, Planning, Collaboration, and Investments, represent the Department on the team. Director Tom Byler began to participate regularly this fall. Among other things, the team is focusing on coordination of implementation of water-related projects and programs which resulted from the 2021 Legislative Session.

D. Deschutes Basin Groundwater Mitigation Program 2020 Annual Review

The Department is required by OAR 690-505-0500(3) and OAR 690-521-0600 to provide annual evaluations on the Deschutes Basin Groundwater Mitigation Program. The annual evaluation is done in coordination with the Oregon Departments of Fish and Wildlife, Environmental Quality, State Lands, and Parks and Recreation. The annual evaluation is included in Attachment 1. The goal of these evaluations is to identify how streamflows are responding to additional groundwater use within the Deschutes Groundwater Study Area and implementation of the mitigation program. This report is separate from the Five-Year Legislative and Administrative Evaluation of the Deschutes Basin Groundwater Mitigation Program, outlined in Agenda Item J.

II. Upcoming Commission / Board Schedules

Commission / Board	Date
Land Conservation and Development Commission	February 3-4, 2022
Parks and Recreation Commission	TBD
Fish and Wildlife Commission	January 15, 2022
State Land Board	December 14, 2021
Environmental Quality Commission	January 21-22, 2022
Watershed Enhancement Board	January 25-26, 2022
Board of Agriculture	TBD

Attachments:

1. Deschutes Basin Groundwater Mitigation Program 2020 Annual Review
2. Rulemaking Calendar

DESCHUTES BASIN GROUNDWATER MITIGATION PROGRAM

Deschutes River below Wickiup – cableway measurement Kyle Gorman June 2006

OREGON
WATER RESOURCES
DEPARTMENT

2020 ANNUAL REVIEW

WRITTEN BY SARAH HENDERSON

OREGON WATER RESOURCES DEPARTMENT

DESCHUTES BASIN GROUNDWATER MITIGATION PROGRAM

2020 ANNUAL REVIEW

OREGON WATER RESOURCES DEPARTMENT

OREGON
WATER RESOURCES
DEPARTMENT

Contents

Introduction

The attached report provides the 2020 Annual Evaluation of the Deschutes Basin Groundwater Mitigation Rules (Oregon Administrative Rule (OAR) Chapter 690, Division 505) and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules (OAR Chapter 690, Division 521).

Background

A groundwater study of the Deschutes Basin above Lake Billy Chinook was conducted in the late 1990's by the U.S. Geological Survey (USGS) in cooperation with the Oregon Water Resources Department (OWRD); the City of Bend; City of Redmond; City of Sisters; Deschutes and Jefferson counties; the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWS); and the U.S. Environmental Protection Agency and the Bureau of Reclamation.

The CTWS (Boundary shown in Appendix 1), along with the United States of America and the State of Oregon, is a party to the Confederated Tribes of the Warm Springs Reservation Water Rights Settlement Agreement, dated November 17, 1997 and amended effective May 16, 2002 (WRSA). The WRSA recognizes CTWS tribal reserved water right interests on the Deschutes River and tributaries for on and off Reservation uses. In addition, the parties to the WRSA have agreed to pursue long-term, cooperative management of the waters that affect their interests.

On September 13, 2002, the Commission adopted the Deschutes Basin Groundwater Mitigation Rules and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules. The rules provide for mitigation of impacts to scenic waterway flows and senior water rights including instream water rights, while allowing additional appropriations of groundwater in the Deschutes Basin Groundwater Study Area (Appendix 2). The mitigation program, by rule, allows an additional 200 cubic feet per second (CFS) of new groundwater use, referred to as the allocation cap.

Evaluation Requirements

Under OAR 690-505-0500(3) and OAR 690-521-0600 of the Deschutes Basin Groundwater Mitigation Rules, the Department is required to annually evaluate and report on the Deschutes Basin Groundwater Mitigation Program, including the implementation and management of mitigation credits allocated through existing mitigation banks. This annual evaluation and report is to include information on new groundwater appropriations, streamflow impacts, and mitigation activity to determine whether scenic waterway flows and instream water right flows in the Deschutes Basin continue to be met on at least an equivalent or more frequent basis as compared to long-term, representative base-period flows (1966 to 1995).

The annual review must address the following topics:

- New groundwater appropriations
- Mitigation activity
- Mitigation bank activity
- Streamflow impacts
- Consultation with the Oregon Department of Fish and Wildlife (ODFW), Oregon Parks and Recreation Department, Oregon Department of Environmental Quality (ODEQ), and Oregon Department of State Lands

- Determination of whether the scenic waterway and instream water right flows in the Deschutes Basin continue to be met on at least an equivalent or more frequent basis

Report Contents

This report incorporates all the elements required for the annual report, as outlined in OAR 690-505-0500(3) and OAR 690-521-0600.

Agency Comments

The Department provided a draft of the report for review by the agencies listed above on October 1, 2022. Comments were provided by ODFW and ODEQ (see Appendix 3) and are summarized below.

Issues and concerns raised by ODFW include:

- Improvements to the Program must be made prior to the allocation cap being lifted.
- Water accounting and monitoring should be improved to ensure mitigation is providing a true offset for impacts and remains available as "wet water" in perpetuity. Such improvements may require additional gages, flow measurement, and modeling beyond what is currently in place.
- Mitigating permanent groundwater rights with temporary leased water.
- Presenting streamflow data in a form more biologically meaningful to fish and aquatic life instead of monthly and annual basis.
- Mitigation under the Program should directly offset the impact by being located upstream of the impacted reach, not within a larger "Zone of Impact."
- Impacts of increased groundwater use under the Mitigation Program to local springs, which are an important source of cold-water inputs to streams by providing cold-water refugia and other habitat benefits for fish.
- Reduction of seepage and loss of cold-water recharge for springs resulting from conversion of area irrigation canals to piped delivery systems.
- The effect of the Mitigation Program on streamflows outside of the irrigation season.
- Potential impacts of the Mitigation Program on the ESA-listed Oregon Spotted Frog.
- Proposed winter reservoir releases with unclear mitigation intent.
- Continue working with other state agencies to seek funding for research, development and implementation of these concerns.
- Limited ability to shape the season of protection and releasing of higher amounts during shoulder months for mitigation projects because of rules and statutes within OWRD.

Issues of concern raised by ODEQ include:

- Allocation cap should not be lifted at this time.
- The model should consider actual streamflows, actual frequency of instream water right being met, groundwater level declines, water quality, and aquatic habitat.
- Additional detailed comments submitted by ODEQ on the draft 2019 annual review of the Deschutes Groundwater Mitigation Program, which include:
  - ODEQ's concurrence with ODFW's comments on the draft 2019 annual review of the Deschutes Groundwater Mitigation Program.
  - Time lag of impacts from groundwater withdrawals.

- Spatial consideration of impacts, recommendation for mitigation projects to be sited upstream from groundwater withdrawals. Currently, mitigation credits may come from anywhere within the Zone of impact.
- Accuracy of accounting, consumptive use coefficients used to determine mitigation requirements and credits.
- Report improvement suggestions, which water rights required to provide mitigation and inclusion of a map summarizing report information.

Allocation Cap

To limit the amount of impact on surface water flows, the mitigation program established a 200 CFS cap on the amount of water that may be allocated to new groundwater use. The allocation cap restriction may only be lifted or modified by the Commission if the Department's evaluation of the mitigation program demonstrates that scenic waterway and instream water right flows are being met on at least an equivalent or more frequent basis as compared to long-term, representative base-period flows (1966 to 1995).

The CFS amount deducted from the 200 CFS cap is the amount of water (in CFS) allowed in the final orders approved by the Department. Final orders set a five-year limit for the applicant to provide the required mitigation. Once they meet their mitigation obligation, the Department issues the groundwater permit. If the mitigation is not provided by the deadline, the final order expires and the CFS is added back into the cap.

All actions that would allow CFS to be added back into the cap are:

1. Rates associated with offsets pursuant to 690-505-0610(8);
2. Rates associated with applications withdrawn after final order issuance pursuant to 690-505-0620;
3. Portions of rates approved by a final order issued under 690-505-0620, but not included in a water right permit that is issued following satisfaction of the mitigation requirement;
4. Rates associated with expired final orders pursuant to 690-505-0620(2);
5. Portions of rates associated with permits issued pursuant to 690-505-0620 and subsequently cancelled;
6. Rates associated with certificates issued pursuant to 690-505-0620 and subsequently canceled; and
7. Rates associated with the portion of use originally authorized under a permit issued pursuant to 690-505-0620, but not included in a subsequent certificate.

Since the adoption of the rules in September 2002 through the end of 2020, there have been approximately 270 groundwater applications submitted to the Department within the Deschutes Basin Groundwater Study Area totaling approximately 336.97 CFS; however, approximately 159.65 CFS was added back to the cap for various reasons (outlined above). Therefore, as of the end of 2020, the total allocated CFS remains under the 200 CFS cap.

Figure 1 below shows the status of all the applications that have been received and the total amount of CFS per action. These actions include the active and pending applications as well as the cancelled, expired, withdrawn, rejected, misfiled, and denied.

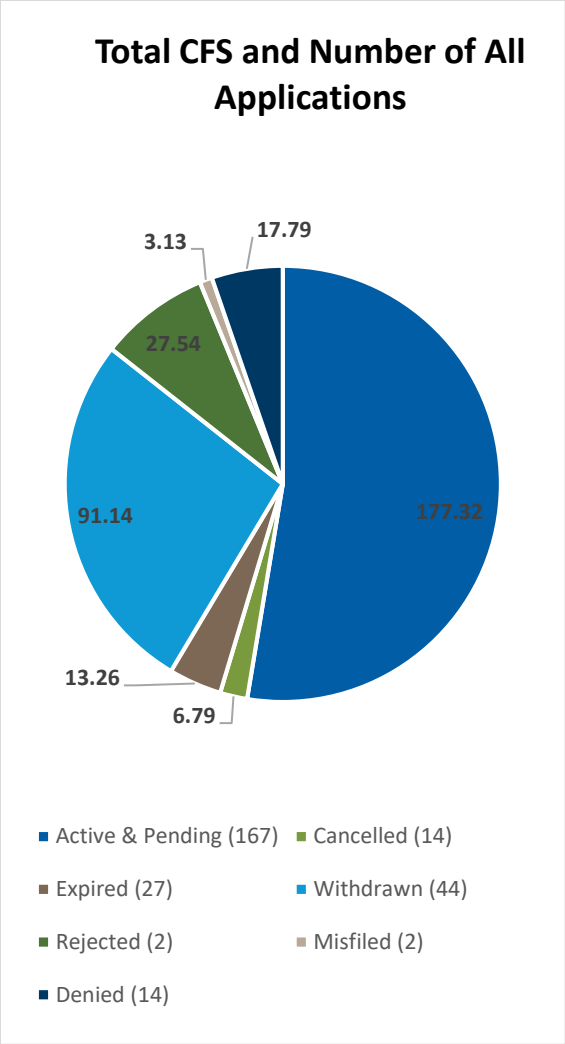


Figure 1: Total CFS & Number of Applications Submitted by end of 2020

2020 Mitigation Activity

New Groundwater appropriations and Mitigation Activities as of end of 2020

A. Active Permits Issued:

- 128 permits issued
- 36 of those have been issued certificates

B. Active Final Orders Issued:

- 17 final orders

C. Applications Pending with No Final Order:

- 22 applications

D. Allocation cap summary (Figure 2):

- 159.10 CFS – total CFS allocated under cap (permits and final orders)
- 18.22 CFS – pending applications not yet deducted from 200 CFS cap
- 22.68 CFS – remaining CFS if all pending applications were approved

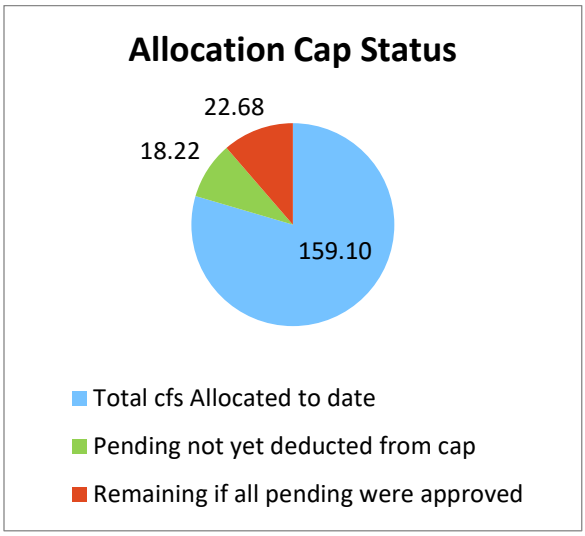


Figure 2: Allocation Cap Status

E. **Incremental Development Plans:** By rule, the Department may allow a municipal or quasi-municipal applicant to satisfy their mitigation obligation incrementally as the water use is developed, rather than requiring mitigation to be provided before the permit is issued. These applicants must report annually to the Department on the volume of water used and the source of mitigation. There are 20 permits that have incremental development plans.

A summary of water use for municipal and quasi-municipal permit holders with incremental development plans is provided in Figure 3. This figure is a comparison between the amount that these water users are authorized to use at full development, the amount of water

they could use based on how much mitigation they have provided through 2020, and the amount of water they actually used during 2020. Overall, in 2020, more mitigation was provided by entities with incremental development plans than was needed to mitigate for their actual use.

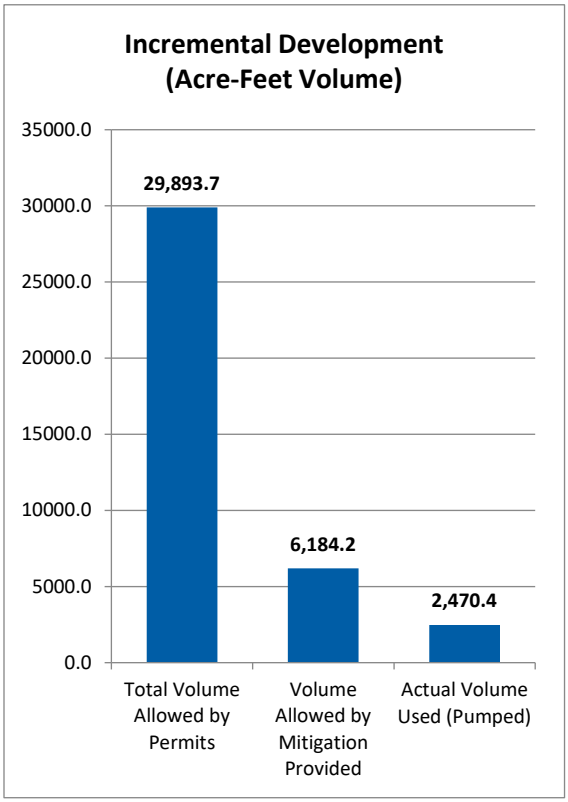


Figure 3: Incremental Development

F. **Mitigation Activity:** Mitigation for active groundwater permits and certificates issued by the Department under the Mitigation Program is provided through permanent instream transfers and temporary instream leases (Figure 4). Mitigation credits established by a Mitigation Project are considered used when assigned to a groundwater application or permit.

- As of the end of 2020 there are 68 total active mitigation projects, consisting of:
    - 49 permanent instream transfer projects; and
    - 19 temporary instream lease projects.

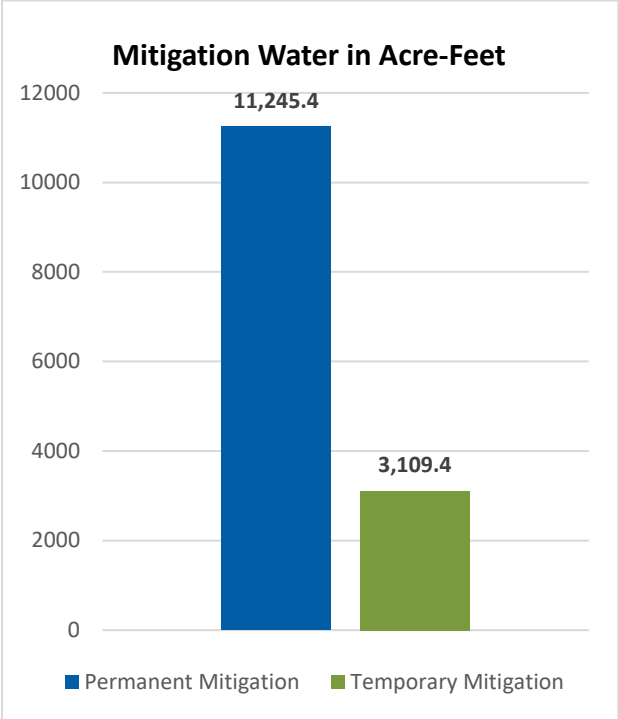


Figure 4: Mitigation Water

- Figure 5 shows the established mitigation broken out by zone of impact. The reason these amounts are more than the established amounts is because mitigation is sometimes established in multiple zones (i.e., 10 credits established in the middle and general zones, but only a maximum total of 10 credits can be used in either the middle or general zones, or a combination thereof).

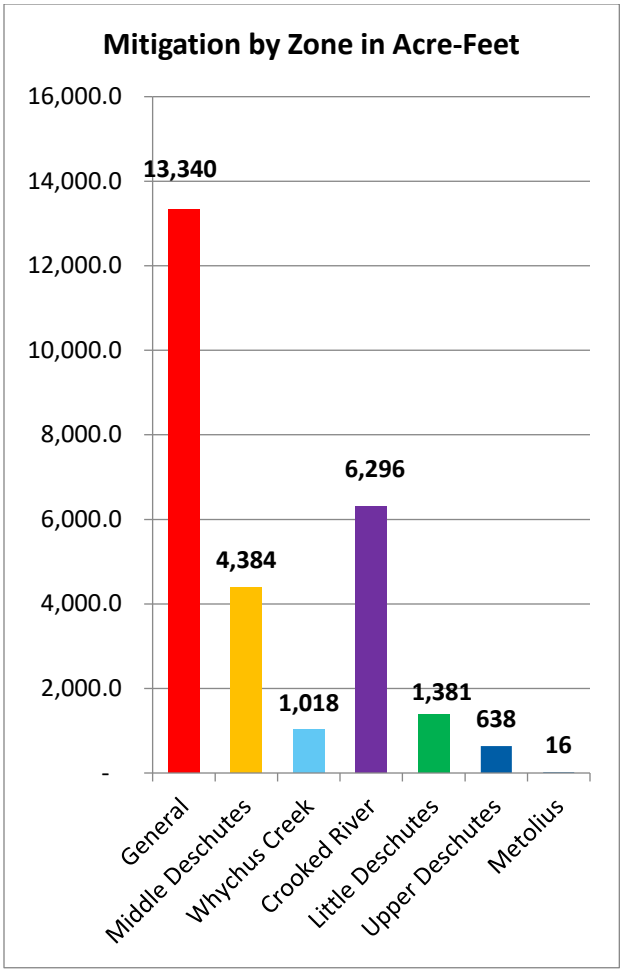


Figure 5: Mitigation by Zone

The above Figures 4 and 5 do not include the 5,100.0 AF of permanent mitigation credits issued to the City of Prineville as identified in Water Right Certificate 94149. These mitigation credits may be used to satisfy the mitigation obligation of a groundwater use found to impact surface water flows in the General and/or Crooked River Zones of Impact and are reported and managed on a water year schedule. These mitigation credits may only be used by the City of Prineville and cannot be conveyed to any other person or mitigation bank. As of the writing of this report, there have been 404.0 AF of mitigation credits assigned to the City of Prineville incremental groundwater permit.

G. **Mitigation Banks:** Mitigation banks must submit an annual report detailing all of the credit transactions and activities for the preceding calendar year. To date, there are three:
   - Deschutes River Conservancy Mitigation Bank (DRCMB);
   - Deschutes Irrigation, LLC; and
   - Arnold Irrigation District Mitigation Bank.

H. Mitigation Bank Activity:

DRCMB

- Filed the required report
- Submitted 19 instream leases in 2020
- Has maintained sufficient "reserve" credits to cover temporary mitigation credits used by groundwater permit holders in each zone of impact. (For each temporary mitigation credit used to satisfy all or part of the mitigation obligation of a groundwater permit, a mitigation bank is required to keep a matching credit in reserve.)
- Figure 6 shows the amount of temporary mitigation credits generated by the DRCMB, the credits allocated to a groundwater permit, and the reserve credits DRCMB is required to keep.

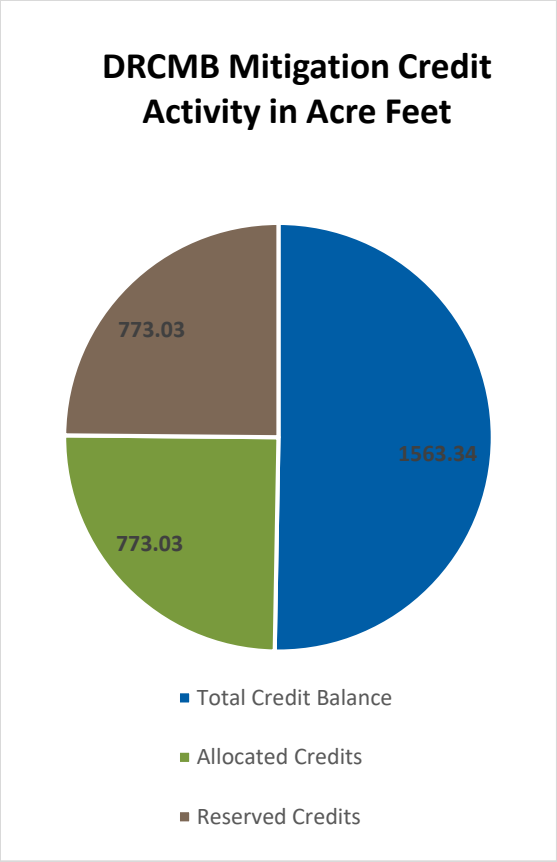


Figure 6: DRCMB Mitigation Credit Activity in Acre Feet

Deschutes Irrigation, LLC

- No activity to date

Arnold Irrigation District Mitigation Bank

- No activity to date

Mitigation Effects on Streamflow

To evaluate the impact of the mitigation program on scenic waterway flows and instream water right flows, the Department developed a streamflow modeling program based on gaging records from the 1966-1995 base period, a pre-mitigation program time frame. The model simulates the estimated hydrologic effects of mitigation credits and debits on the historical records at the gaged locations across the basin, and then evaluates how often the instream flow requirements (ISFR) are met based on this adjusted streamflow data compared to the original flow records (Cooper, 2008). A modeling approach was used because the steady-state, long-term impact of streamflow to mitigation-related activities may take years or even decades to be reflected as actual changes in streamflow (Gannett and Lite, 2004), plus climate variability generally masks the streamflow response to mitigation activities at most locations (Cooper, 2008). The simulations do not reflect activities affecting streamflow outside of the mitigation program, such as canal piping/lining.

Analysis of the 2020 data demonstrates that, on an annual basis, the simulated change in percent of time instream flow requirements (% ISFR) are met at the evaluation points ranges from -0.17% to +1.08%. Similarly, the overall annual change in mean streamflow ranges from -0.006 CFS to +22.0 CFS (Appendix 4).

Consistent with previous annual reports, the seasonal change in the quantity of streamflow (CFS) continues to be negative at all evaluation points during the non-irrigation season and positive at all evaluation points during the irrigation season, reflecting the general timing difference between the hydrologic impacts to streamflow of credits (irrigation season) and debits (year-around).

Similarly, the changes in % ISFR met) generally follows this same seasonality as changes in streamflow quantity. The magnitude of change in % ISFR met varies by month and site, reflecting how close historical flows were to the ISFR prior to the mitigation program. If the historical flows were close to the ISFR for a given evaluation site, then a small change in flows can result in a large change in % ISFR is met, while the opposite is true if the historical flows differed greatly from the ISFR.

Again, this difference in seasonal results is expected due to the inherent timing difference between when the effects of debits and credits reach the stream network. Debits (new groundwater withdrawals) produce a decrease in streamflow year-round due to the pumping effects on groundwater being attenuated in time (Gannett and Lite, 2004). Credit (instream leases and instream transfers of surface water rights) effects are immediate and occur primarily during the irrigation season.

Summary

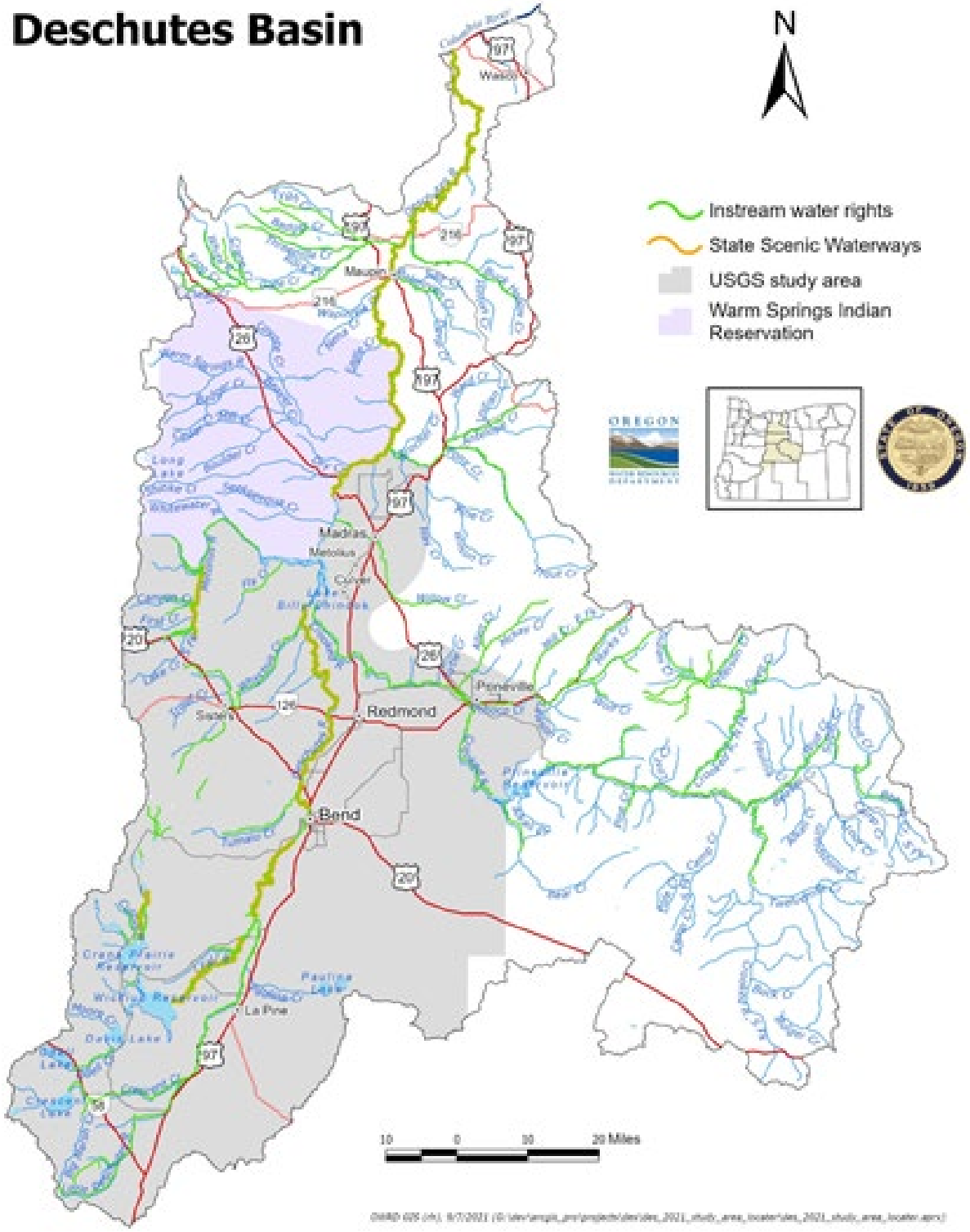
The Department continues working to effectively implement the Deschutes Groundwater Mitigation Program. Groundwater permit applications and mitigation projects are moving through the required processes. Overall, the program continues to produce positive benefits as more mitigation water has been approved and protected instream than is required for active groundwater permits and certificates.

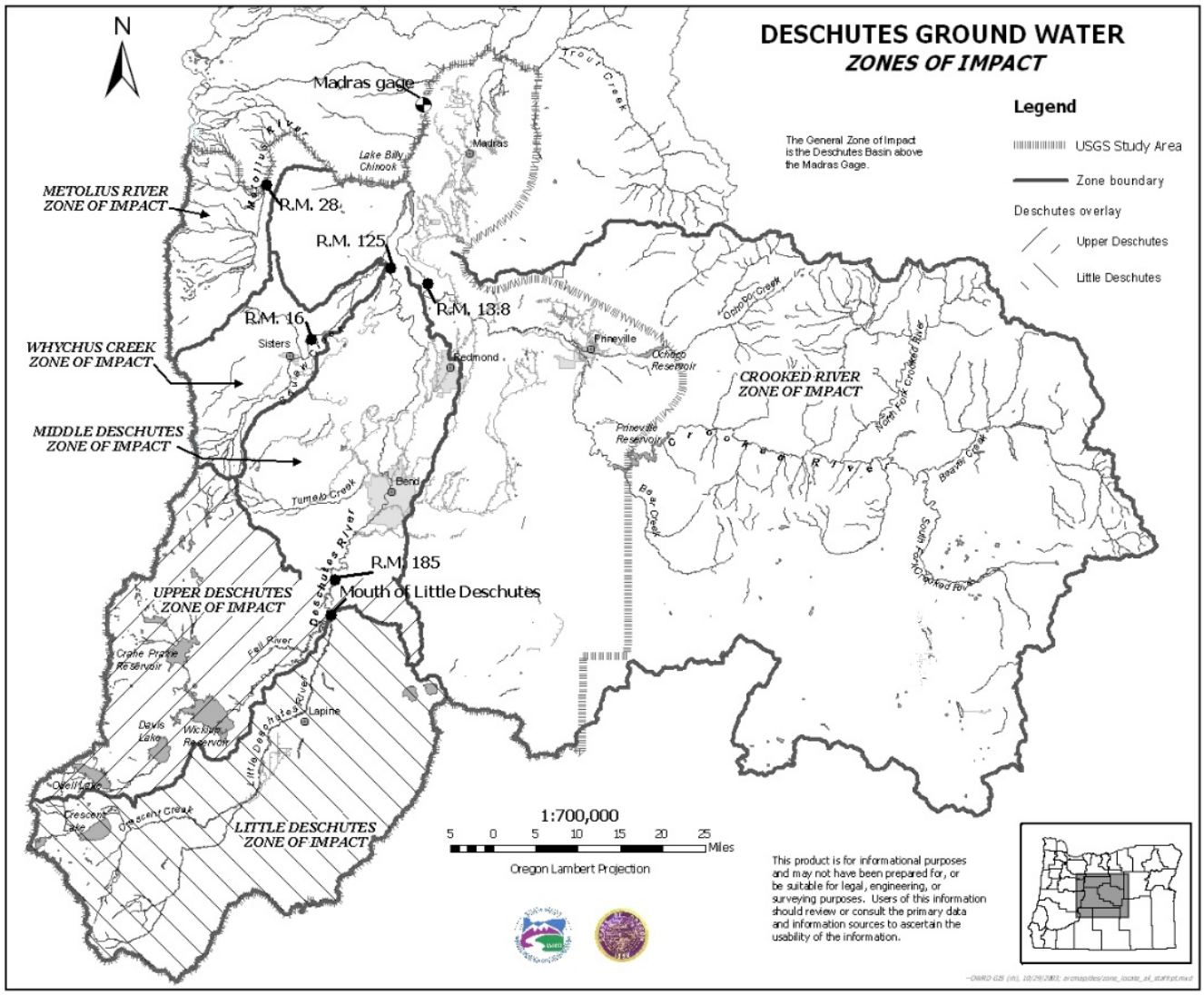
In response to comments received from sister agencies (as outlined in "Agency Comments" above and provided in Appendix 3 attached to this report), the Department understands the concerns brought forth regarding the zonal mitigation impacts, model accounting and climate change, and impacts during the non-irrigation season. From the beginning of the Deschutes Mitigation Program, however, it was determined that the program should be structured in such a way so that it was a manageable system for OWRD to track and maintain. OWRD considered the goals of the Mitigation Program, the Deschutes Groundwater Mitigation Flow Model, and the base period flows (1996-1995) and created sub-zones and consumptive use coefficients to keep the Deschutes Mitigation Program manageable. Seasonal uses were allowed to generate credits that can then be purchased to mitigate for year-round uses. OWRD will need to work with ODFW, ODEQ, and stakeholders to address these challenging issues. Other concerns may need to be addressed through other venues and initiatives to develop and implement a basin-wide water management plan.

In addition, the Department is aware that several stakeholders in the basin are concerned with the status of the 200 CFS allocation cap and would like the Department to begin work immediately to explore the feasibility of modifying the cap. As discussed in the "Allocation Cap" section of this report, the quantity of water (CFS) allocated under the cap fluctuates up and down from year to year as a result of various administrative actions (i.e., denial, cancellation, expiration, withdrawal, etc.) which add back previously deducted CFS to the cap. As of the end of 2020, 159.10 CFS was allocated under the cap. While it may appear an adequate amount of water is still available under the allocation cap, the Department intends to explore the issue of modifying the allocation cap in 2022.

Appendices

1. Deschutes Basin Groundwater Study Area Map
2. Deschutes Basin Groundwater Study Area Zone of Impact Map
3. Comments from ODFW and ODEQ
4. Summary of Modeled Streamflow for Water Year Ending September 2020


Deschutes Basin
N
Instream water rights
State Scenic Waterways
USGS study area
Warm Springs Indian Reservation
OREGON
Madras
Redmond
Prineville
Bend
La Pine
Sisters
Maupin
Wasco
10 0 10 20 Miles


DESCHUTES GROUND WATER
ZONES OF IMPACT
N
Legend
USGS Study Area
Zone boundary
Deschutes overlay
Upper Deschutes
Little Deschutes
The General Zone of Impact is the Deschutes Basin above the Madras Gage.
Madras gage
Madras
Trout Creek
Lake Billy Chinook
METOLIUS RIVER ZONE OF IMPACT
R.M. 28
R.M. 125
R.M. 13.8
R.M. 16
WHYCHUS CREEK ZONE OF IMPACT
Sisters
Squaw Creek
Redmond
Prineville
Ochoco Reservoir
Ochoco Creek
CROOKED RIVER ZONE OF IMPACT
North Fork Crooked River
Prineville Reservoir
Crooked River
Bear Creek
Beaver Creek
South Fork Crooked River
MIDDLE DESCHUTES ZONE OF IMPACT
Tumalo Creek
Bend
Deschutes River
R.M. 185
Mouth of Little Deschutes
UPPER DESCHUTES ZONE OF IMPACT
Crane Prairie Reservoir
Fall River
Davis Lake
Wickiup Reservoir
Little Deschutes River
Lapine
Odell Lake
Crescent Lake
Odell Creek
LITTLE DESCHUTES ZONE OF IMPACT
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Miles
Oregon Lambert Projection
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Oregon
Kate Brown, Governor

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October 29, 2021

Sarah Henderson
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Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1271

RE: DRAFT 2020 Annual Review of the Deschutes Groundwater Mitigation Program

Dear Ms. Henderson,

The Oregon Department of Fish and Wildlife (ODFW) appreciates the opportunity to provide comments on the DRAFT 2020 Annual Review of the Deschutes Groundwater Mitigation Program. Overall, ODFW agrees that the Deschutes Groundwater Mitigation Program (Program) has been successful in maintaining and improving flows in the middle and lower Deschutes River during the irrigation season. Increases in streamflow during the irrigation season in the Middle Deschutes has provided an added benefit to the overall objective of the rules, which are to maintain Scenic Waterway flows in the lower Deschutes River. However, as we acquire more information about the additional detrimental impacts to fish and wildlife expected in the future from a changing climate, we have increasing concerns about water accounting, the impacts to springs, and decreases in streamflow during the non-irrigation season.

Since inception of the Program, ODFW has annually submitted comments that address our ongoing concerns with Program implementation and monitoring. We are pleased that the Oregon Water Resources Department (OWRD) recognized these concerns in the recent 5-year Program review and provided potential solutions. ODFW looks forward to continuing conversations and advising the agency on ways to strengthen the efficacy of the Program to improve and protect instream flow for fish, wildlife, and their habitats.

ODFW will again review our primary concerns here for the record. Specifically, these tangible improvements to the Program need to be addressed before the 200 cfs cap on the Program is lifted:

Water Accounting and Impacts of Climate Change

A. ODFW recommends the Program include a protocol for monitoring, accounting (measuring), and reporting the volume of water transferred instream from annual mitigation credits in each zone of impact. Ideally, this would protocol would include an assessment on more of a case-by-case or reach-specific basis to clearly distinguish Program benefits from the many other conservation actions going on in the basin to conserve water. Currently, the Deschutes River Conservancy tracks and accounts for the administrative transfer of water instream, but the verification and measurement of actual "wet water" used as mitigation in each zone is limited. A monitoring program should be developed by OWRD for assessing effectiveness of the Program to ensure mitigation is providing a true offset for impacts as initially intended and remains available as "wet water" in perpetuity (or for the life of the project). This may require additional gauges, flow measurement, and modeling beyond what is currently in place.

   We recognize that climate change will exacerbate existing issues and alter streamflow, temperatures, and adjacent landscape characteristics necessary to support fish and wildlife populations. As we acquire more information about the detrimental impacts to fish and wildlife expected from a changing climate, closely monitoring groundwater use and associated mitigation is a necessity for the Program. In fact, Gannett and Lite, in their 2013 report "Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon," found that groundwater flow model simulations indicated that climate variations have the largest influence on groundwater levels throughout the upper Deschutes Basin.

B. A portion of the water supporting the Program is leased instream. ODFW is concerned with mitigating permanent groundwater rights with temporary leased water. This could set up the potential in the future to not have enough mitigation water conserved to cover all the permanent groundwater rights that need mitigated. In cases where permanent groundwater pumping certificates have been granted, temporary instream leasing provides no certainty that the mitigation will remain in place for the life of the permit and/or certificate. Past Program reports have identified permit holders that have allowed temporary credits to expire while continuing to irrigate. It is not clear if this issue has been addressed. Therefore, OWRD should increase compliance monitoring and immediate regulation of non-compliant participants. ODFW proposes that OWRD and program partners work more proactively to provide permanent mitigation water (permanent instream transfers) to offset groundwater pumping and discontinue the issuance of temporary leased water to the extent practical.

C. ODFW recommends modifying the presentation of flow data. The annual reports for the Program consistently present flow data on a monthly and annual basis, which

demonstrate minor changes in instream flow quantities from the baseline. Because fish and other aquatic organisms are very susceptible to acute and chronic events (e.g., dewatered reaches or lower flow rates for extended periods), annual and even seasonal changes do not necessarily reflect true impacts to aquatic life. ODFW recommends presenting streamflow data in a form that is more biologically meaningfully to fish and aquatic life, such as showing improvements during low flow periods, variability in flows throughout the year, and flows during critical life history stages (e.g., migration, spawning, overwintering).

Zonal Mitigation

Allowing mitigation for groundwater impacts to occur away from the point of impact but within a larger "Zone of Impact" results in localized impacts to streams and the fish and wildlife they support. This is particularly true for the General Zone. Mitigation under the Program should directly offset the impact by being located upstream of the impacted reach consistent with the Program goals to provide for new ground water uses while maintaining scenic waterway and instream water right flows in the Deschutes Basin.

Impacts to Seeps and Springs

ODFW continues to express concerns with the localized impacts of groundwater pumping on local seeps and springs. In addition to providing much of the flow to Upper Deschutes Basin streams, springs contribute very important cold-water inputs, creating cold water refugia and providing other habitat benefits for fish, wildlife, and botanical resources. Groundwater contribution to streamflow via springs also helps to attenuate the effects of climate change by cooling stream temperatures during the summer when flows are depleted. Over time, continued and increased groundwater withdrawal for agricultural, residential, and municipal needs will further reduce groundwater-level elevations and affect spring discharge when there is a surface/groundwater connection. Impacts to springs from current and future groundwater withdrawals are further exacerbated by the increasing trend to convert area irrigation canals to piped delivery systems. While this is positive in that it generates conserved water that currently results in improved instream flows in the middle Deschutes River, it also eliminates seepage from canals, which in the past provided some benefit in terms of aquifer recharge and cold-water spring input. The result is an exchange (loss) of cold spring water for warmer water upstream. Further, any future shift for conserved water projects that return flow to the upper Deschutes River to benefit the Oregon Spotted Frog (*see* **Impacts During the Non-Irrigation Season**), particularly during the winter months, will add additional stress on the middle Deschutes and lower Crooked rivers in the valuable spring recharge areas. The impacts on fisheries from these inconsistencies are likely to become more pronounced in future years as climate change continues to be increasingly more influential. Cold water refugia could likely become critical to long-term persistence of many fish species and populations and should be considered as a high

priority for conservation and protection when making in water management decisions and when assessing effectiveness of the Program.

As identified in the 5-year Review, ODFW looks forward to working with OWRD to identify key springs/spring complexes in the basin and requests that OWRD implement a program to monitor these key complexes to determine ecological impacts to spring flow, including discharge, temperature, and nutrient changes resulting from groundwater pumping. Monitoring impacts of groundwater pumping on springs and spring complexes is important with respect to their aquatic habitat, botanical, wildlife, water quality, water quantity, and societal values. This issue was recognized by state and federal agencies several years ago but work to address the concerns needs to again become a high priority. ODFW is willing to work with other agencies to seek funding, coordinate efforts for research, and develop and implement a strategy to address these concerns.

Impacts During the Non-Irrigation Season

As currently designed, the Program mitigates year-round groundwater withdrawals only with seasonal irrigation water and reports changes to streamflow on an annual basis. This type of mitigation does provide for more instream water during the irrigation season, as is consistently reported, but is also reported to reduce flows in the lower river during the non-irrigation season. Critical fish life history components occur outside of the irrigation season, particularly during "shoulder months" at the beginning and end of the irrigation season (March/April and October/November).

In addition, current implementation of the Program poses potential impacts to the ESA-listed Oregon Spotted Frog (OSF) outside of the irrigation season. Improving winter flows on the upper Deschutes River below Wickiup Reservoir and on Crescent Creek is essential to the survival of the OSF, and freshwater spring habitats in the upper Deschutes Basin have been identified as critical to overwinter survival. Therefore, increasing winter and shoulder season streamflow in the Upper and Middle Deschutes River below Wickiup Dam provides additional benefit for many of the fish and wildlife species present by increasing aquatic habitat during the overwintering, spawning, and incubation periods.

The continual detrimental impact to streamflow during the non-irrigation season is now a greater concern for more than just the "shoulder months." Most stakeholders recognize that non-irrigation flow concerns still need to be addressed for the Deschutes basin as a whole. In the past, OWRD recognized this concern as well. One option, which is currently being sought by water users in the basin, would be to release stored water in Wickiup, Crane Prairie, Crescent and other reservoirs instream during the winter and shoulder months. ODFW recognizes the release of stored water during the non-irrigation season as a valuable tool for supplementing the existing mitigation credits that are currently limited to the irrigation season. Winter releases would aide in offsetting impacts of groundwater withdrawal on a true 1:1, year-round basis, but only if utilized

as mitigation for winter impacts and in partnership with other mitigation applied to the irrigation season. To fully mitigate impacts to fish and wildlife resulting from groundwater withdrawals, mitigation credits should apply the appropriate volume and quality of water to both the middle and upper Deschutes River on a year-round basis.

200 CFS Cap

Stream flows outside the irrigation season are important to fish for several reasons, including providing habitat for spawning, overwintering, and rearing throughout the year, and especially for juvenile salmon and steelhead during the spring outmigration beginning in March and continuing through May. When the Program rules were developed, all parties recognized the Program would reduce flows in the lower river during the non-irrigation season. Because of this, the 200 cfs cap was put in place to limit flow reduction impacts in the lower river outside of the irrigation season and allow for an overall assessment of the Program. All stakeholders at the time recognized that non-irrigation flow concerns still needed to be addressed for the Deschutes basin as a whole. With current efforts to reintroduce salmon and steelhead upstream of Lake Billy Chinook, providing streamflow mitigation benefits on a year-round basis is more important than ever.

ODFW would like OWRD and program partners to work with us to seek clear and measurable options for year-round mitigation to offset year-round impacts. Therefore, the 200 cfs allocation cap should remain until such time as the winter flow issues can be resolved. Maintaining the cap will ensure that groundwater reductions due to unmitigated, non-irrigation season use is kept to a minimum (*see* **Impacts During the Non-Irrigation Season**).

Review of Mitigation Projects

OWRD works in cooperation with ODFW to enhance the resource benefits and make the most effective use of mitigation projects and mitigation water (OAR 690-505-0615(7)).

Currently, ODFW's understanding is that in practice, WRD is seeking input regarding shaping of mitigation flows for proposed mitigation projects. However, this shaping is limited to the season of the original water right and some certificates have protocols that preclude releasing higher amounts during shoulder months. As such, ODFW is limited in our ability to effectively comment on mitigation projects so that they maximize benefits to fish and wildlife. ODFW would like to provide more meaningful input that benefits fish and wildlife year-round in reach-specific locations, which may require updates to the existing rules. This will aide in ensuring that mitigation is offsetting the local impact and not resulting in impacts during the non-irrigation season.

Thank you for the chance to comment. We look forward to revisiting Program goals and rule language and pursuing solutions to our concerns in upcoming discussions as OWRD plans for

Program updates. In the meantime, the 200 cfs cap should not be lifted until these issues are resolved, and the Commission can determine that scenic waterway flows and instream water right flows in the Deschutes Basin continue to be met year round on at least an equivalent or more frequent basis as compared to long-term, representative base period flows established by the Department per OAR 690-505-0500(4). If you have any questions, please contact me (503-947-6092) in Salem or Jerry George (541-388-6009) in Bend.

Sincerely,

Danette L Faucera

Danette Faucera, Water Policy Coordinator

Gerald J George

Jerry George, Deschutes District Fish Biologist

References:

Gannett, M.W., and Lite, K.E., Jr., 2013, Analysis of 1997–2008 groundwater level changes in the upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2013-5092, 34 p., http://pubs.usgs.gov/sir/2013/5092.

Oregon
Kate Brown, Governor

Department of Fish and Wildlife
Fish Division
4034 Fairview Industrial Drive SE
Salem, OR 97302
(503) 947-6201
FAX (503) 947-6202
www.dfw.state.or.us/

July 22, 2020

Sarah Henderson
Flow Restoration Program Coordinator, Transfer and Conservation Division
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1271

RE: DRAFT 2019 Annual Review of the Deschutes Groundwater Mitigation Program

Dear Ms. Henderson,

The Oregon Department of Fish and Wildlife (ODFW) appreciates the opportunity to comment on the DRAFT 2019 Annual Review of the Deschutes Groundwater Mitigation Program (Program). Overall, ODFW agrees that the Program has been successful in maintaining and improving flows in the middle and lower Deschutes River during the irrigation season. However, as we acquire more information about the additional detrimental impacts to fish and wildlife expected in the future from a changing climate, we have increasing concerns about water accounting, the impacts to springs, and decreases in flow during the non-irrigation season. These issues are also of immediate concern, as water users are currently moving ahead with innovative means to secure future mitigation credits that may not fully meet the needs of fish and wildlife in the basin (e.g., proposed winter reservoir releases with unclear mitigation intent).

ODFW has consistently submitted comments on past annual reports that address our ongoing concerns with the Program. We are pleased to learn that the Oregon Water Resources Department (OWRD) will soon convene stakeholders to revisit the statutes and rules in preparation for the upcoming 5-year Program review. ODFW looks forward to continuing conversations and advising the agency on ways to strengthen the efficacy of the Program to improve and protect instream flow for fish, wildlife, and their habitats.

Because a stakeholder group has not yet been convened, ODFW will review our primary concerns here. Specifically, ODFW requests tangible improvements to the Program in the following areas:

Water Accounting and Impacts of Climate Change

ODFW recommends the Program include a protocol for monitoring, accounting (measuring), and reporting the volume of water transferred instream from annual mitigation credits in each zone of influence. Currently, the Deschutes River Conservancy tracks and accounts for the administrative transfer of water instream, but the verification and measurement of actual "wet water" used as mitigation in each zone is limited. A monitoring program to ensure mitigation is providing a true offset for impacts as initially intended and remains available as "wet water" in perpetuity (or for the life of the project) is necessary for assessing effectiveness of the Program. This may require additional gauges and flow measurement beyond what is currently in place.

We know that climate change will exacerbate existing issues and alter streamflow, temperatures, and adjacent landscape characteristics necessary to support fish and wildlife populations. As we acquire more information about the detrimental impacts to fish and wildlife expected from a changing climate, closely monitoring groundwater use and associated mitigation is a necessity for the Program. In fact, Gannett and Lite, in their 2013 report "Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon," found that groundwater flow model simulations indicated that climate variations have the largest influence on groundwater levels throughout the upper Deschutes Basin.

Impacts to Springs

ODFW continues to express concerns with the localized impacts of groundwater pumping on local springs. Springs provide very important cold water inputs to streams by providing cold water refugia and other habitat benefits for fish and by helping to cool stream temperatures during the summer in streams with depleted flows. Over time, ODFW assumes that continued and increased groundwater withdrawal for agricultural, residential, and municipal needs will further affect springs when there is a surface/groundwater connection. Impacts to springs from current and future groundwater withdrawals are exacerbated by the increasing trend to convert area irrigation canals to piped delivery systems. While this is positive in that it generates conserved water that currently results in improved instream flows in the middle Deschutes River, it also eliminates seepage, which recharges the aquifer and contributes to spring recharge of cold water. The result is an exchange (loss) of cold spring water for warmer water upstream. Further, any future shift for conserved water projects that return flow to the upper Deschutes River to benefit the Oregon Spotted Frog (*see* **Impacts During the Non-Irrigation Season**), particularly during the winter months, will add additional stress on the middle Deschutes and lower Crooked rivers in the valuable spring recharge areas. The fisheries impacts from these inconsistencies are likely to become more pronounced in future years as climate change continues to be increasingly more influential. Cold water refugia could likely become critical to long-term persistence of many fish species and populations and should be

considered in water management decisions and when assessing effectiveness of the Program.

As noted as an action in the 2016 Annual Report and topic for a stakeholder Work Group, ODFW requests that OWRD consider implementing a program to monitor key springs/spring complexes in the basin to determine ecological impacts to spring flow, including temperature and nutrient changes resulting from groundwater pumping. ODFW is willing to work with other agencies to seek funding, coordinate efforts for research, and develop and implement a strategy to address these concerns.

Impacts During the Non-Irrigation Season

As currently designed, the Program mitigates year-round groundwater withdrawals with irrigation season water and reports changes to streamflow on an annual basis. This type of mitigation does provide for more instream water during the irrigation season, as reported again in this current review, but is also reported to reduce flows in the lower river during the non-irrigation season. Critical fish life history components occur outside of the irrigation season, particularly during "shoulder months" at the beginning and end of the irrigation season (March/April and October/November).

In addition, current implementation of the Program poses potential impacts to the ESA-listed Oregon Spotted Frog (OSF) outside of the irrigation season. Improving winter flows on the upper Deschutes River below Wickiup Reservoir and on Crescent Creek is essential to the survival of the OSF, and freshwater spring habitats in the upper Deschutes Basin have been identified as critical to overwinter survival.

The continual detrimental impact to streamflow during the non-irrigation season is now a greater concern for more than just the "shoulder months." Most stakeholders recognize that non-irrigation flow concerns still need to be addressed for the Deschutes basin as a whole. In the past, OWRD recognized this concern as well. One option, which is currently being sought by water users in the basin, would be to release stored water in Wickiup, Crane Prairie, Crescent and other reservoirs instream during the winter and shoulder months. ODFW recognizes the release of stored water during the non-irrigation season as a valuable tool for supplementing the existing mitigation credits that are currently limited to the irrigation season. Winter releases would aide in offsetting impacts of groundwater withdrawal on a true 1:1, year round basis, but only if utilized as mitigation for winter impacts and in partnership with other mitigation applied to the irrigation season. To fully mitigate impacts to fish and wildlife resulting from groundwater withdrawals, mitigation credits should apply the appropriate volume of water to both the middle and upper Deschutes River on a year round basis.

ODFW would like OWRD and program partners to work with us to seek clear options for year-round mitigation to offset year-round impacts.

Thank you for the chance to comment. We look forward to pursuing solutions to our concerns and encourage OWRD to schedule dates for a stakeholder Work Group as soon as possible so we can revisit Program goals and rule language and plan for Program updates. If you have any questions in the meantime, please contact me (503-947-6092) in Salem or Brett Hodgson (541-388-6363) in Bend.

Sincerely,

Danette Faucera
Water Policy Coordinator

Brett Hodgson
Deschutes District Fish Biologist

References:

Gannett, M.W., and Lite, K.E., Jr., 2013, Analysis of 1997–2008 groundwater level changes in the upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2013-5092, 34 p., http://pubs.usgs.gov/sir/2013/5092.

HENDERSON Sarah A * WRD

From: MEHTA Smita * DEQ
Sent: Monday, October 18, 2021 10:02 AM
To: HENDERSON Sarah A * WRD
Cc: FAUCERA Danette L * ODFW; MOBERLY Erik R * ODFW
Subject: RE: Your review / comment requested: DRAFT Deschutes GW Mitigation Program 2020 Annual Review

Categories: IMPORTANT - DON'T BE LATE

Hi Sarah,

Thank you for the opportunity to submit comments on the 2020 Deschutes Groundwater Mitigation Program Annual Review. DEQ has the following comment.

DEQ concurs with OWRD that the 200 cfs allocation cap should not be lifted at this time. The report states that the frequency at which modelled instream water rights are met has not changed significantly since the start of the program. However, the model doesn't consider several other important factors that indicate whether the Mitigation Program supports the sustainability of the resource and designated beneficial uses. These factors include: actual streamflows, actual frequency of instream water rights being met, groundwater level decline, water quality, aquatic habitat. The program should begin to track changes in these factors over time to determine trends in each. This would provide a better foundation on which to determine the success of the program.

For more detailed comments, please see DEQ's comments on the 2019 Deschutes Groundwater Mitigation Program Annual Review.

Sincerely,
Smita

Smita Mehta
TMDL Basin Coordinator
Oregon Department of Environmental Quality
475 NE Bellevue Drive, Suite 110
Bend, OR 97701
541-633-2022
Smita.Mehta@deq.state.or.us

Oregon
Kate Brown, Governor

Department of Environmental Quality
Eastern Region Bend Office
475 NE Bellevue Drive, Suite 110
Bend, OR 97701
(541) 388-6146
FAX (541) 388-8283
TTY 711

July 24, 2020

Sarah Henderson
Flow Restoration Program Coordinator
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem, OR 97301

RE: DRAFT 2019 Annual Review of the Deschutes Groundwater Mitigation Program

Dear Ms. Henderson,

The Oregon Department of Environmental Quality appreciates the opportunity to provide comments on the Oregon Department of Water Resources' Draft 2019 Annual Review of the Deschutes Groundwater Mitigation Program.

The Deschutes Groundwater Mitigation Program is intended to protect instream flows for scenic waterways and senior water rights including instream water rights. Protecting instream flows is an essential part of protecting water quality. When flows are diminished by withdrawals or other causes, streams have less capacity to assimilate pollutants and become less resilient to climate changes. In other words, protecting instream flows keeps our streams fishable, swimmable, and drinkable. ODEQ has reviewed the draft report and has several comments and concerns.

ODEQ concurs with ODFW's comments

ODFW submitted comprehensive comments on the Draft 2019 Annual Review on July 22, 2020. ODEQ concurs with ODFW's comments and will not repeat those comments here.

Time lag of impacts

The impacts of groundwater withdrawals affect groundwater flow patterns at a regional scale and therefore we may not see flow diminishment in streams for many years. In the meantime, mitigation water increases instream flows immediately. This makes it seem like the mitigation program is a success. However, future decades may see a decline in streamflow from today's groundwater withdrawals and additional mitigation may become necessary. Monitoring streams and springs throughout the basin and reviews of the Deschutes Groundwater Mitigation Program need to continue for decades to ensure that the Program meets its goals of protecting instream flow.

Spatial consideration of impacts

Streamflows in the upper portions of the basin are more susceptible to diminishment under the Program. Groundwater flow paths are shorter, which means that the impacts of increased groundwater withdrawals on

streamflow are likely to show up sooner. Also, mitigation credits may come from anywhere within the Zone of Mitigation. This means that mitigation credits near the mouth can be used to offset a withdrawal near the headwaters. In this example, it is unlikely that the mitigation project at the mouth would mitigate the local impact to streamflow in the headwaters. DEQ recommends that mitigation projects be sited upgradient from groundwater withdrawals.

Similarly, groundwater withdrawals with direct, local impacts to streams, as determined by OWRD's Groundwater Section, should be mitigated by projects upstream of the diminished reach.

Accuracy of accounting

The consumptive use coefficient used to determine mitigation requirements and mitigation credits should reflect the actual use, including frequency of annual use, and use type (such as pivots vs flood irrigation, vs domestic use. The consumptive use of a senior right with sprinkler irrigation is much higher than the consumptive use of a junior right with flood irrigation. Leasing an infrequently used inefficient use instream to mitigate for a highly efficient frequent use would lead to inaccuracies in accounting.

Suggestions for report improvements

The Annual Review should clarify which types of water rights are included in the Deschutes Groundwater Mitigation Program. OWRD issues many types of water rights including surface water, groundwater, reservoir, limited licenses, use of stored water, instream water rights, transfers, leases, alternate reservoir, etc. It was recently brought to my attention that limited licenses are not required to be mitigated by the Program. Which water rights are required to be mitigated by the Program?

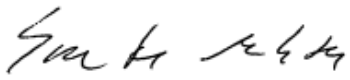
In Figure 4, it would be helpful to have a second set of bars that should how much water has been allocated in each zone.

Define "established mitigation" and "temporary mitigation credit" on page 3.

The Appendix 3 tables are very helpful. It would be even more helpful if the report could summarize this information in a map (or set of maps) or a chart.

Thank you, again, for the opportunity to comment. I look forward to continuing conversations with OWRD on the Deschutes Groundwater Mitigation Program and working together to ensure the protection of instream flows in Oregon.

Sincerely,



Smita Mehta
Deschutes Basin Coordinator

Streamflow Model Data

The data presented in the following tables are from the Department's Deschutes Mitigation model. The "before mitigation" or baseline condition of streams in the Deschutes Basin has been determined from streamflows measured during water years 1966 to 1995. The model has been developed to mathematically estimate the change in streamflow expected due to mitigation (credits) and groundwater allocation (debits). The model is designed to reflect the theoretical, steady-state response of streamflow to mitigation-related activities only. In some cases, the actual hydrologic response to mitigation activities, such as new groundwater pumping, may take years or decades to be reflected as changes in streamflow.

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Mouth

Time: 09:43 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	93.20	92.90	-0.32	-0.35
FEB	90.80	90.20	-0.59	-0.65
MAR	95.30	95.10	-0.22	-0.23
APR	99.90	99.80	-0.11	-0.11
MAY	99.10	99.50	0.32	0.32
JUN	98.00	98.80	0.78	0.79
JUL	91.00	93.10	2.15	2.31
AUG	100.00	100.00	0.00	0.00
SEP	98.10	98.20	0.11	0.11
OCT	97.40	97.50	0.11	0.11
NOV	99.90	99.80	-0.11	-0.11
DEC	91.70	91.10	-0.64	-0.71
ANNUAL	96.20	96.30	0.13	0.13

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Mouth

Time: 09:43 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	6910.0	6890.0	-25.4	-0.37
FEB	7080.0	7050.0	-25.4	-0.36
MAR	7250.0	7220.0	-25.3	-0.35
APR	6640.0	6630.0	-2.70	-0.04
MAY	5800.0	5820.0	18.9	0.32
JUN	5200.0	5230.0	34.6	0.66
JUL	4590.0	4630.0	41.9	0.90
AUG	4380.0	4420.0	40.8	0.92
SEP	4430.0	4460.0	29.3	0.66
OCT	4710.0	4710.0	3.81	0.08
NOV	5390.0	5370.0	-25.1	-0.47
DEC	6190.0	6160.0	-25.4	-0.41
ANNUAL	5710.0	5710.0	3.48	0.06

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River below Pelton Dam

Time: 09:45 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	64.70	63.90	-0.86	-1.35
FEB	63.00	61.50	-1.53	-2.50
MAR	67.80	66.70	-1.18	-1.77
APR	71.40	71.30	-0.11	-0.16
MAY	58.80	63.70	4.84	7.60
JUN	55.60	60.20	4.67	7.75
JUL	41.00	45.20	4.19	9.29
AUG	98.20	99.40	1.18	1.19
SEP	66.80	69.10	2.33	3.38
OCT	81.10	81.10	0.00	0.00
NOV	97.20	97.20	0.00	0.00
DEC	66.10	65.40	-0.75	-1.15
ANNUAL	69.30	70.40	1.08	1.53

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River below Pelton Dam

Time: 09:45 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	5240.0	5220.0	-25.4	-0.49
FEB	5190.0	5170.0	-25.4	-0.49
MAR	5520.0	5500.0	-25.3	-0.46
APR	5130.0	5130.0	-2.70	-0.05
MAY	4420.0	4440.0	18.9	0.43
JUN	4230.0	4260.0	34.6	0.81
JUL	4020.0	4060.0	41.9	1.03
AUG	3940.0	3980.0	40.8	1.03
SEP	3980.0	4000.0	29.3	0.73
OCT	4190.0	4190.0	3.81	0.09
NOV	4680.0	4660.0	-25.1	-0.54
DEC	5030.0	5010.0	-25.4	-0.51
ANNUAL	4630.0	4630.0	3.48	0.08

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Metolius River at Lake Billy Chinook

Time: 09:46 Date: 08/13/2021

Month	Base Line %	Mitigated %	Change in Percentage %	Percent Change %
JAN	97.70	97.70	0.00	0.00
FEB	99.20	99.20	0.00	0.00
MAR	99.80	99.80	0.00	0.00
APR	100.00	100.00	0.00	0.00
MAY	100.00	100.00	0.00	0.00
JUN	100.00	100.00	0.00	0.00
JUL	100.00	100.00	0.00	0.00
AUG	100.00	100.00	0.00	0.00
SEP	100.00	100.00	0.00	0.00
OCT	100.00	100.00	0.00	0.00
NOV	100.00	100.00	0.00	0.00
DEC	100.00	100.00	0.00	0.00
ANNUAL	99.70	99.70	0.00	0.00

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Metolius River at Lake Billy Chinook

Time: 09:46 Date: 08/13/2021

Month	Base Line cfs	Mitigated cfs	Change in cfs cfs	Percent Change %
JAN	1510.0	1510.0	-0.044	0.00
FEB	1560.0	1560.0	-0.044	0.00
MAR	1560.0	1560.0	-0.044	0.00
APR	1520.0	1520.0	-0.044	0.00
MAY	1560.0	1560.0	0.056	0.00
JUN	1590.0	1590.0	0.056	0.00
JUL	1490.0	1490.0	0.056	0.00
AUG	1400.0	1400.0	0.056	0.00
SEP	1350.0	1350.0	0.006	0.00
OCT	1330.0	1330.0	-0.044	0.00
NOV	1370.0	1370.0	-0.044	0.00
DEC	1450.0	1450.0	-0.044	0.00
ANNUAL	1470.0	1470.0	-0.006	0.00

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Lake Billy Chinook
Time: 09:46 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	100.00	100.00	0.00	0.00
FEB	100.00	100.00	0.00	0.00
MAR	100.00	100.00	0.00	0.00
APR	97.10	99.80	2.67	2.67
MAY	100.00	100.00	0.00	0.00
JUN	100.00	100.00	0.00	0.00
JUL	100.00	100.00	0.00	0.00
AUG	100.00	100.00	0.00	0.00
SEP	100.00	100.00	0.00	0.00
OCT	94.40	99.60	5.16	5.18
NOV	100.00	100.00	0.00	0.00
DEC	100.00	100.00	0.00	0.00
ANNUAL	99.30	99.90	0.66	0.66

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Lake Billy Chinook
Time: 09:47 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	1300.0	1290.0	-9.36	-0.73
FEB	1320.0	1310.0	-9.36	-0.71
MAR	1300.0	1290.0	-9.21	-0.72
APR	843.0	855.0	12.6	1.47
MAY	552.0	584.0	31.9	5.46
JUN	606.0	651.0	45.0	6.90
JUL	550.0	602.0	52.2	8.67
AUG	519.0	570.0	51.1	8.96
SEP	537.0	577.0	39.6	6.86
OCT	725.0	742.0	16.3	2.20
NOV	1130.0	1120.0	-9.36	-0.84
DEC	1220.0	1210.0	-9.36	-0.77
ANNUAL	881.0	898.0	17.0	1.89

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Lower Bridge
Time: 09:47 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	60.50	59.00	-1.51	-2.55
FEB	63.80	62.50	-1.30	-2.08
MAR	68.30	67.70	-0.54	-0.79
APR	23.60	24.40	0.89	3.64
MAY	1.29	1.51	0.22	14.30
JUN	2.11	3.33	1.22	36.70
JUL	0.11	0.86	0.75	87.50
AUG	0.86	1.61	0.75	46.70
SEP	3.67	4.44	0.78	17.50
OCT	13.00	14.10	1.08	7.63
NOV	52.20	50.90	-1.33	-2.62
DEC	56.30	55.60	-0.75	-1.35
ANNUAL	28.60	28.70	0.03	0.10

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Lower Bridge
Time: 09:48 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	683.0	681.0	-1.80	-0.26
FEB	705.0	703.0	-1.80	-0.25
MAR	714.0	712.0	-1.80	-0.25
APR	299.0	318.0	19.6	6.14
MAY	51.2	89.2	38.1	42.60
JUN	50.5	99.8	49.3	49.40
JUL	42.6	94.6	52.0	55.00
AUG	46.2	97.6	51.4	52.70
SEP	61.0	101.0	40.0	39.60
OCT	222.0	243.0	21.6	8.88
NOV	551.0	549.0	-1.80	-0.33
DEC	614.0	612.0	-1.80	-0.29
ANNUAL	335.0	357.0	22.0	6.18

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River above Diversion Dam at Bend
Time: 09:48 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	37.30	37.20	-0.11	-0.29
FEB	40.00	39.30	-0.71	-1.80
MAR	42.90	42.20	-0.75	-1.79
APR	73.20	73.30	0.11	0.15
MAY	97.00	97.00	0.00	0.00
JUN	100.00	100.00	0.00	0.00
JUL	100.00	100.00	0.00	0.00
AUG	100.00	100.00	0.00	0.00
SEP	97.00	97.60	0.56	0.57
OCT	54.60	55.30	0.64	1.17
NOV	29.00	28.70	-0.33	-1.16
DEC	35.70	35.50	-0.22	-0.61
ANNUAL	67.40	67.30	-0.06	-0.09

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River above Diversion Dam at Bend
Time: 09:48 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	712.0	711.0	-1.77	-0.25
FEB	738.0	736.0	-1.77	-0.24
MAR	781.0	779.0	-1.77	-0.23
APR	877.0	878.0	1.24	0.14
MAY	1180.0	1180.0	3.52	0.30
JUN	1360.0	1360.0	5.07	0.37
JUL	1440.0	1440.0	7.88	0.55
AUG	1290.0	1300.0	7.35	0.57
SEP	1090.0	1100.0	5.95	0.54
OCT	721.0	725.0	4.27	0.59
NOV	590.0	588.0	-1.77	-0.30
DEC	650.0	648.0	-1.77	-0.27
ANNUAL	953.0	955.0	2.23	0.23

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Benham Falls
Time: 09:49 Date: 08/13/2021

Month	Base Line %	Mitigated %	Change in Percentage %	Percent Change %
JAN	43.40	43.20	-0.22	-0.50
FEB	54.50	54.40	-0.12	-0.22
MAR	32.50	31.40	-1.08	-3.42
APR	69.60	69.60	0.00	0.00
MAY	78.10	78.10	0.00	0.00
JUN	92.60	92.60	0.00	0.00
JUL	96.80	96.80	0.00	0.00
AUG	94.50	94.60	0.11	0.11
SEP	67.80	67.90	0.11	0.16
OCT	54.00	54.00	0.00	0.00
NOV	35.90	35.70	-0.22	-0.62
DEC	44.60	44.60	0.00	0.00
ANNUAL	63.70	63.60	-0.12	-0.19

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River at Benham Falls
Time: 09:49 Date: 08/13/2021

Month	Base Line cfs	Mitigated cfs	Change in cfs	Percent Change %
JAN	814.0	812.0	-1.75	-0.22
FEB	845.0	844.0	-1.75	-0.21
MAR	901.0	899.0	-1.75	-0.19
APR	1240.0	1240.0	-0.672	-0.05
MAY	1850.0	1850.0	0.150	0.01
JUN	2100.0	2100.0	0.830	0.04
JUL	2200.0	2200.0	3.64	0.17
AUG	2040.0	2040.0	3.11	0.15
SEP	1730.0	1740.0	2.61	0.15
OCT	1000.0	1010.0	2.45	0.24
NOV	685.0	683.0	-1.75	-0.26
DEC	752.0	750.0	-1.75	-0.23
ANNUAL	1350.0	1350.0	0.297	0.02

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Little Deschutes River at mouth
Time: 09:50 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	22.90	20.80	-2.15	-10.40
FEB	37.30	34.60	-2.72	-7.85
MAR	27.40	27.10	-0.32	-1.19
APR	45.20	45.00	-0.22	-0.49
MAY	55.90	55.80	-0.11	-0.19
JUN	56.60	56.70	0.11	0.20
JUL	85.10	86.80	1.72	1.98
AUG	93.90	94.30	0.43	0.46
SEP	72.00	73.10	1.11	1.52
OCT	11.60	12.80	1.18	9.24
NOV	14.70	14.00	-0.67	-4.76
DEC	20.30	19.70	-0.64	-3.28
ANNUAL	45.30	45.10	-0.17	-0.38

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Little Deschutes River at mouth
Time: 09:50 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	162.0	160.0	-1.72	-1.07
FEB	183.0	181.0	-1.72	-0.94
MAR	219.0	218.0	-1.72	-0.79
APR	262.0	262.0	-0.641	-0.25
MAY	329.0	329.0	0.181	0.05
JUN	298.0	299.0	0.861	0.29
JUL	230.0	234.0	3.67	1.57
AUG	200.0	203.0	3.14	1.55
SEP	144.0	146.0	2.65	1.81
OCT	76.7	79.1	2.48	3.13
NOV	108.0	106.0	-1.72	-1.61
DEC	142.0	141.0	-1.72	-1.22
ANNUAL	196.0	197.0	0.328	0.17

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River above Little Deschutes River
Time: 09:51 Date: 08/13/2021

Month	Base Line	Mitigated	Change in Percentage	Percent Change
	%	%	%	%
JAN	29.70	29.70	0.00	0.00
FEB	30.10	30.10	0.00	0.00
MAR	33.50	33.50	0.00	0.00
APR	68.40	68.40	0.00	0.00
MAY	97.80	97.80	0.00	0.00
JUN	98.80	98.80	0.00	0.00
JUL	100.00	100.00	0.00	0.00
AUG	100.00	100.00	0.00	0.00
SEP	99.80	99.80	0.00	0.00
OCT	56.80	56.80	0.00	0.00
NOV	20.90	20.90	0.00	0.00
DEC	24.70	24.70	0.00	0.00
ANNUAL	63.50	63.50	0.00	0.00

Enter (1) to CONTINUE; (2) to WRITE the Table:

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2020

Deschutes River above Little Deschutes River
Time: 09:51 Date: 08/13/2021

Month	Base Line	Mitigated	Change in cfs	Percent Change
	cfs	cfs	cfs	%
JAN	329.0	329.0	0.000	0.00
FEB	331.0	331.0	0.000	0.00
MAR	319.0	319.0	0.000	0.00
APR	654.0	654.0	0.000	0.00
MAY	1220.0	1220.0	0.000	0.00
JUN	1500.0	1500.0	0.000	0.00
JUL	1690.0	1690.0	0.000	0.00
AUG	1530.0	1530.0	0.000	0.00
SEP	1260.0	1260.0	0.000	0.00
OCT	561.0	561.0	0.000	0.00
NOV	246.0	246.0	0.000	0.00
DEC	280.0	280.0	0.000	0.00
ANNUAL	829.0	829.0	0.000	0.00

Oregon Water Resources Department
Current/Anticipated Rulemaking

Rule Division	Topic	Lead Staff	GWAC Input Expected?	Target WRC Date	Status
Division 10 – Critical Groundwater Areas (CGWA)	Conform Rules with ORS 537.730–742 / Establish Framework for CGWA Designations	Ivan Gall, Justin Iverson	Yes	2022	Preparing for Public Meeting & RAC
Division 54 (New Rule Division)	Conversion of Hydroelectric Water Right to Instream Water Right	Dwight French, Mary Grainey	No	2022	Public Comment Period Open
Division 77 – Instream Water Rights	Updates to Rules / Streamline District Lease Process / Consistency with SB 199 (2013) & SB 206 (2015) / Instream Leases and Transfers of Stored Water	Dwight French, Lisa Jaramillo, Sarah Henderson	No	TBD	Preparing to Reconvene RAC
TBD – Klamath Groundwater	Regulation of Wells in the Klamath Basin	Ivan Gall	Yes	TBD	On Hold
Division 340 (Formerly New Rule Division 87)	Municipal Reclaimed Water Registrations	Dwight French, Kerri Cope	No	TBD	On Hold
Divisions 200 205 & 240 – Well Construction Licensing	HB 3030 and SB 688 Implementation Relating to Temporary Authorizations for Armed Forces Spouses	Kris Byrd	Yes	TBD	On Hold

Division 215	Replace Erroneously Repealed Section Relating to Dedicated Measuring Tubes (690-215-0200)	Kris Byrd	No	TBD	On Hold
Divisions 190 225 & 260	Updates to Rules / HB 2145 (2021) Implementation Relating to Exempt Map and Recording Fee / Civil Penalties	Kris Byrd, Travis Kelly	No	2022	Preparing for RAC
Division 51 – Hydroelectric Fees	HB 2143 (2021) Implementation (Repeal) Relating to Annual Fee	Dwight French, Mary Grainey	No	2022	Preparing Draft Rules
Division 380 – Water Right Transfers	HB 3103 (2021) Implementation Relating to Stored Water Character of Use Transfers	Dwight French, Lisa Jaramillo	No	2022	Preparing Draft Rules
Division 512 – Malheur Lake Basin Program	Update to Rules Following Publication of Groundwater Study	Ivan Gall, Justin Iverson	Yes	2022	Not Started