Oregon
Kate Brown, Governor

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MEMORANDUM

TO: Water Resources Commission

FROM: Dwight French, Water Right Services Administrator
Laura Wilke, Flow Restoration Program Coordinator

DATE: Agenda Item A, November 19, 2015
Water Resources Commission Meeting

Part 1: Deschutes Basin Groundwater Mitigation Program - 2014 Annual Review
Part 2: House Bill 3623: Deschutes Groundwater Mitigation Program Evaluation

Introduction

Part 1 of this report, required by Oregon Administrative Rule (OAR) 690-505-0500(3) and OAR 690-521-0600, provides the 2014 annual evaluation of the Deschutes Ground Water Mitigation Rules (OAR Chapter 690, Division 505) and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules (OAR Chapter 690, Division 521).

Part 2 of this report provides a summary of the Department's review of the Deschutes Groundwater Mitigation Program as required under House Bill 3623 (Chapter 694, 2011 Oregon Laws).

Background

On September 13, 2002, the Commission adopted the Deschutes Ground Water Mitigation Rules and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules. These rules implement Senate Bill 1033 (codified as ORS 390.835, 1995 Oregon Law), House Bill 2184 (codified as ORS 537.746, 2001 Oregon Laws), House Bill 3494 (Chapter 669, 2005 Oregon Laws), and most recently House Bill 3623 (Chapter 694, 2011 Oregon Laws). HB 3623 replaced HB 3494. The rules provide for mitigation of impacts to scenic waterway flows and senior water rights, while allowing additional appropriations of groundwater in the Deschutes Groundwater Study Area (see Attachment 1).

The Deschutes Ground Water Mitigation Rules allow groundwater users to provide mitigation through an individual mitigation project, a mitigation credit holder, or an approved mitigation bank. The Deschutes Basin Mitigation Bank and Mitigation Credit Rules authorize the establishment of a mitigation credit system and mitigation banks to help facilitate transactions among holders of mitigation credits and persons interested in acquiring mitigation credits.

On June 4, 2010, the Commission adopted the Deschutes Basin Water Management Rules (OAR Chapter 690, Division 522), which operate in conjunction with the Deschutes Ground Water Mitigation Rules and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules. The Deschutes Basin Water Management Rules changed how the Department counts new groundwater permit applications under the allocation cap and allowed some unused mitigation credits to be reassigned. The rules also clarified how municipal and quasi-municipal permit holders can provide mitigation under incremental development plans, and allowed additional flexibility to use "offsets" and move mitigation credits between permits. These rules were amended by the Commission on June 19, 2015. The rule amendments removed references to cancellation statutes to add additional flexibility to exchange mitigation credits and add water back to the allocation cap when a permit or certificate is cancelled.

During the 2011 Legislative session, House Bill 3623 extended the January 2, 2014 sunset on the mitigation program to January 2, 2029. House Bill 3623 directs the Department to report to the Legislative Assembly every five years on the outcomes of the Department's Mitigation Program for the Deschutes Basin Groundwater Study Area. The first report to the Legislature is due in February 2016. An update on the status of the development of the House Bill 3623 report is provided in the second part of this staff report.

I. Part 1: Deschutes Basin Groundwater Mitigation Program - 2014 Annual Review

A. Program Highlights

- 104 active permits and certificates have been issued under the Mitigation Program.
- As of the end of 2014, approximately 135 cubic feet per second (cfs) of water had been allocated under new permits and approved final orders. This leaves 65 cfs that can still be approved under the 200 cfs allocation cap.
- The majority of mitigation is from permanent mitigation projects (instream transfers).
- More mitigation has been in place on an annual basis in each zone of impact than needed for groundwater permits and certificates under the mitigation program.
- Model results through 2014 suggest that instream flows are nearly identical to base line conditions on an annual basis.

B. Discussion

Under the Deschutes Ground Water Mitigation Rules, the Department is required to annually evaluate the Mitigation Program, including the implementation and management of mitigation credits allocated through existing mitigation banks.

As part of the development of the annual evaluation of the Mitigation Program, the Department is also required to consult with the Oregon Department of Fish and Wildlife (ODFW), Oregon State Parks and Recreation Department, Oregon Department of Environmental Quality, and Oregon Department of State Lands. The Department also consults with the Oregon Department of Agriculture. The Department provided a draft of the annual evaluation for review by these

agencies on September 30, 2015. Comments were provided by ODFW (Attachment 2). Issues of concern raised by ODFW include:

- The effect of the Mitigation Program on streamflows outside of the irrigation season;
- The presentation of flow data should be modified to a format more relevant to fish;
- That the 200 cfs allocation cap should be maintained until impacts of the Mitigation Program on flows outside of the irrigation season can be resolved.
- Concern over continued use of temporary mitigation for permanent groundwater uses.
- Potential impacts of the Mitigation Program on the Oregon Spotted Frog, which has been recently listed under the Endangered Species Act.
- Concern over impacts of increased groundwater use under the Mitigation Program to local springs, which are an important source of cold water, versus mitigation water that is primarily warmer water from storage.

The comments raised by ODFW are similar to their comments related to issues identified in the development of the House Bill 3623 report and are discussed in more detail in that draft report.

The Mitigation Program in the Deschutes Groundwater Study Area continues to address new and changing water needs, while protecting scenic waterway flows. Mitigation Program activities are summarized below.

1. New Groundwater Appropriations and Mitigation Activities

Permits Issued: Since adoption of the mitigation rules in September 2002, a total of 108 groundwater permits with associated mitigation have been issued. Seven of these permits have been cancelled. Four permits have been issued certificates. Three new permits were issued in 2014 and allow the use of water for irrigation purposes of up to 36.0 Acre-Feet (AF) annually with a mitigation requirement of 21.6 AF (consumptive portion). No other additional permits were issued in 2014.

Applications with Final Orders: By the end of 2014, 15 groundwater permit applications had been processed to the final order stage. Permits will be issued when the required mitigation or any other required information (such as permit recording fees) is provided. Upon issuing a final order approving a new groundwater use, the applicant has five years to provide the required mitigation. Once mitigation obligations are met, the Department issues the groundwater permit and the new permit holder may begin using water. Groundwater use may not begin until a permit is issued. If mitigation is not provided within the five-year timeline, the final order expires. As of year-end 2014, one final order had expired resulting in 0.025 cfs being added back into the 200 cfs allocation cap.

Pending Applications: There are another 21 pending applications for groundwater use in the Deschutes Ground Water Study Area. Attachment 3 provides a breakdown of the pending applications and their status.

Allocation Cap Summary: The amount of new groundwater use that can be approved under the program is limited to a total of 200 cfs. Between the end of 2014 and the start of the mitigation program in 2002, approximately 135 cfs of water was allocated under new permits and approved final orders. This leaves 65 cfs that can still be approved under the 200 cfs allocation cap. At the end of 2014, there was an additional 32.9 cfs in pending applications which, if approved, would leave approximately 32 cfs available under the 200 cfs cap.

The Department previously identified a need for additional modifications to the Deschutes Basin Water Management rules in Division 522. In OAR 690-522-0030, the rules originally restricted the statute under which a permit may be cancelled and its water added back to the allocation cap to ORS 537.410. This cancellation process is not frequently used by the Department. Cancellations are more routinely processed under the authority of ORS 537.260. Moreover, the provision in the rules did not allow water associated with permits that are voluntarily cancelled to be added back to the 200 cfs allocation cap.

This issue was highlighted as part of the 2012 annual evaluation and 5 year evaluation of the mitigation program presented to the Commission in March 2014. During that meeting, the Commission directed staff to initiate rulemaking to clarify how the Department adds water back to the allocation cap and reestablishes mitigation credits based on cancellation of a permit. On June 19, 2015, the Commission adopted modifications to Division 522 that removed the cancellation process restrictions. Following adoption of the rules, the Department was able to return approximately 0.5 cfs back to the allocation cap.

Incremental Development Plans: By rule, the Department may allow a municipal or quasi-municipal applicant to supply mitigation incrementally, over a period of time, as the water use is developed rather than requiring that all mitigation be provided before the permit is issued. A total of 13 permits with incremental development plans have been approved. The amount of mitigation provided must coincide with the rate of development within each increment. Each permit holder must have an incremental development plan on file with the Department and may amend that plan with prior approval by the Department. The Division 522 rules clarify how municipal and quasi-municipal permit holders may grow into each increment. Municipal and quasi-municipal permit holders must include the annual volume of water used and the source of mitigation used as part of their annual reporting requirements. A summary of water use for municipal and quasi-municipal permit holders is provided in Attachment 4.

Overall, in 2014, more mitigation was provided by entities with incremental development plans than was needed based on reported water use levels (see Attachment 4). Total mitigation provided was 1,673.0 AF and the amount of mitigation needed based on reported use was 819.7 AF. There was one permit holder in 2014 that used more water than was covered by mitigation. This same permit holder did not provide sufficient mitigation in 2013. The Department has worked with this permit holder over the past couple of years to get them back on track. They are currently providing sufficient mitigation and are now required to provide monthly reports on their water use. This will enable the Department and

the permit holder to track water use under this permit as compared to the amount of mitigation provided.

2. Mitigation Activity

Mitigation for active groundwater permits and certificates issued by the Department under the Mitigation Program is being provided through permanent instream transfers and temporary instream leases.

The majority of mitigation water continues to be primarily from instream transfers. Mitigation is considered used when assigned to a groundwater application or permit. Attachment 5 provides a summary of the amount of permanent and temporary mitigation provided in 2014 and the amount of mitigation used in 2014.

The amount of mitigation water used each year is less than the full amount of mitigation required by permits and certificates, primarily because municipal and quasi-municipal permit holders can provide mitigation incrementally. In 2014, the full mitigation obligation of all permits/certificates was 12,664.3 AF, of which 11,226.6 AF (89%) was associated with municipal and quasi-municipal permits. However, in 2014, only up to 2,631.3 AF of mitigation water was needed to meet consumptive use by municipal and quasi-municipal water users under the Mitigation Program. The municipal and quasi-municipal permit holders provided 3,484.6 AF of mitigation, meaning that these permit holders are not only meeting their mitigation requirements but also that those with incremental development plans are providing mitigation in advance of actual need. Attachment 6 highlights the amount of mitigation required and the amount of mitigation provided for all permits and certificates.

Each January, the Deschutes River Conservancy (DRC) Mitigation Bank submits a report detailing all of the credit transactions and activities for the proceeding calendar year. Generally, the DRC Mitigation Bank has operated with temporary mitigation credits based on instream leases. In all cases, the DRC Mitigation Bank 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 part or all of the mitigation obligation of a groundwater permit, the DRC Mitigation Bank is required to keep a matching credit in reserve. In 2014, the DRC Mitigation Bank completed 38 mitigation credit transactions with groundwater permit holders and permit applicants.

In 2014, there were 49 active mitigation projects. These were comprised of 16 instream leases (submitted by the DRC Mitigation Bank) and 33 permanent instream transfers (submitted by other parties). Attachment 7 provides a summary of groundwater permit and mitigation activity for 2014 by zone of impact and demonstrates that more mitigation (including unused mitigation) is in place than required in each of the zones of impact. As of year-end 2014, there were 11 permits that completely switched from temporary mitigation credits to permanent credits (no change from 2013). Four other permits have partially switched to permanent mitigation credits.

In 2014, five permits issued with a mitigation obligation totaling 123.3 AF failed to provide part or all of the required mitigation, resulting in approximately 65.2 AF not being covered with associated mitigation. The source of mitigation for each of these permits had previously been temporary credits from the Deschutes River Conservancy Mitigation Bank. Each groundwater permit holder is required by rule and by permit condition to provide mitigation for the life of the groundwater permit, and subsequent certificate.

One of these permit holders has since provided additional mitigation for 2015 and is no longer delinquent. The remaining four permits did not provide mitigation for multiple years and were cancelled in 2015. Only one of the four cancelled permit holders was identified as using water without benefit of mitigation.

The Department has identified that a more robust and clear process for addressing permits without mitigation is needed and is working with local staff and the DRC Mitigation Bank to develop an active process that will include regulation and compliance actions. This is also discussed in greater detail in the draft House Bill 3623 Legislative report.

3. Mitigation and Streamflow Monitoring

To monitor the impact of new groundwater permits and mitigation on scenic waterway flows and instream water right flows, the Department developed a streamflow modeling program. The model was constructed using a base-period of flows from 1966 to 1995 at selected gaging stations around the basin. This base-period represents streamflows during a period of time after the dams in the basin were constructed and before the Scenic Waterway Act was amended to include consideration of groundwater impacts. The model then applies the effect of the estimated hydrologic impact of mitigation credits and debits to this historical data. It should be noted that the model is designed only to reflect the theoretical, steady-state response of streamflow to mitigation-related activities. The actual hydrologic response to mitigation activities may take years in some cases to be reflected in the change in streamflow. In addition, climate variability masks the actual streamflow response in most locations; hence the reason a modeling approach was used. No attempt has been made to reflect other streamflow restoration activities such as instream transfers or riparian enhancement activities.

Analysis of the 2014 data demonstrates that, on an annual basis, the change in percent of time the instream flow requirements are met at the evaluation points is predominantly positive, ranging from -0.12% to +0.60% (see Attachment 8). Similarly, the overall annual change in streamflow is positive (+16.0 cfs) above Lake Billy Chinook to slightly negative below (-0.968 cfs).

Consistent with previous evaluations of the mitigation program, the absolute change in streamflow on a seasonal basis continues to be negative at all evaluation points during the non–irrigation season and positive at all evaluation points during the summer. This is expected given the timing difference between the effects of new groundwater withdrawals and mitigation projects (i.e. instream transfers and leases) on streamflow. New groundwater uses produce a

decrease in streamflow that is uniformly distributed over the year, while mitigation projects generally increase streamflow only during the irrigation season (Attachment 8).

The seasonal changes in percent of time the instream flow requirements (ISFR) are met at each evaluation site follows the seasonal impacts in terms of absolute streamflow. During the non–irrigation season, the impact to the percent of time the ISFR is met is generally negative while the percent of the impact during the irrigation season is predominantly positive. The relative change in percent of time the ISFR is met varies by month and site, depending on how close the 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 relate to a relatively large change in percent of time the ISFR is met (see summer flows for the Deschutes River at Lower Bridge, Attachment 8). The opposite is true if the historical flows differed greatly from the ISFR (see summer flows for the Deschutes River at Lake Billy Chinook, Attachment 8).

The Department has also noted small negative changes in streamflow on an annual basis at certain evaluation points (see Attachment 8). For example, for the Deschutes River below Pelton and at the mouth, there appears to have been an annual reduction in streamflows of -0.968 cfs, which is only 0.02 percent of the mean annual streamflow. This is in part due to the resolution of the model and a small amount of mitigation project return flows that may occur outside of the study area.

Another consideration is related to how groundwater permits and mitigation projects are entered into the streamflow model. The model assumes full use by groundwater permit holders. However, not all permit holders are required to provide their full amount of mitigation before the permit is issued. In the case of municipal and quasi-municipal permit holders, they have the option of providing mitigation incrementally to match the development of the permit over time. The amount of mitigation provided and entered into the streamflow model is currently less than what all permits issued under the mitigation program will need at full use levels. However, these users are providing more mitigation than required at current use levels. For example, in the General Zone of Impact, in 2014, the maximum amount of consumptive use allowed by municipal and quasi-municipal permit holders with incremental development plans was 6,992 AF. However, the authorized consumptive use level under incremental development was 1,049 AF, and the amount of mitigation provided by these users was 976 AF. Based upon 2014 reported annual use levels, these permit holders in the General Zone of Impact appear to have only needed about 558 AF of mitigation. There is a similar situation in each of the zones of impact.

Over time, as municipal and quasi-municipal permits with incremental mitigation plans and their mitigation are developed and added to the streamflow model, the Department anticipates that the annual change will move towards a more accurate reflection of the changes to streamflow. The Department will continue to evaluate streamflow model results on an annual basis to determine whether streamflows continue to be met on an equivalent or more frequent basis.

C. Summary

The Department continues to work hard to effectively implement the Deschutes Ground Water Mitigation Program. Groundwater permit applications and mitigation projects are moving through the required processes. The program is producing positive benefits as more mitigation water has been approved and protected instream than required for the 104 active groundwater permits and certificates issued.

Model results through 2014 suggest that instream flows have largely remained unchanged compared to base line conditions on an annual basis. Seasonally, the mitigation effects on the instream requirements are negative during the non-irrigation season and positive during the irrigation season. These differences in seasonal effects are inherent in the mitigation program and will continue into the future. The relative impact to the percent of time the ISFR are met on a monthly basis depends on how close the ISFR is to the pre–mitigation streamflow and varies by each evaluation site.

II. Part 2: House Bill 3623: Deschutes Groundwater Mitigation Program Evaluation

A. Background

House Bill 3623 (Chapter 669, 2011 Oregon Law) declared that the administrative rules adopted by the Commission for the Deschutes Groundwater Study Area satisfy the mitigation requirements for new groundwater uses with impacts to surface water flows, including Scenic Waterway and Instream Water Rights. House Bill 3623 required the Department to evaluate the Mitigation Program every five years and states that the report shall include a summary of:

- Program impacts on other water users of the Deschutes Basin;
- Potential timing of mitigation;
- Identification of zones of impact;
- Review impacts on the headwaters of the Metolius River and other key reaches of the Metolius River system;
- Potential timing of Federal, state and local storage improvements; and
- Other issues identified by stakeholders.

House Bill 3623 also required the Department to periodically review the Mitigation Program for the Deschutes Basin Groundwater Study Area. The review is required to include the identification of regulatory and statutory changes that may improve the program in order to address and mitigate injury to existing water rights and spring systems, and to offset measurable reductions of Scenic Waterway flows.

Each of these elements, including a variety of additional issues raised by stakeholders, are described and evaluated in the draft version of the HB 3623 attached to this staff report (Attachment 9). The draft HB 3623 report also includes initial recommendations for regulatory and statutory improvements.

B. Report Development Process

To evaluate the Mitigation Program, the Department relied upon its own tracking of data, the Deschutes Streamflow Model, technical and local staff input, and feedback from stakeholders. The Department solicited stakeholder input on January 23, 2015. In response, the Department received comments from:

- Central Oregon Irrigation District
- Central Oregon Land Watch
- City of Bend
- Deschutes River Conservancy
- Friends of the Metolius
- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Martha Pagel, attorney, Schwabe, Williamson & Wyatt
- Water Right Services, consultant
- WaterWatch of Oregon

The feedback provided by these stakeholders can be found on the Department's web page at http://www.oregon.gov/owrd/docs/HB_3623_Stakeholder_Feedback.pdf.

A draft report was then developed and circulated to stakeholders on August 17, 2015. Additional feedback on the draft report was received from:

- Bureau of Land Management
- Central Oregon Land Watch
- City of Bend
- City of Prineville
- City of Redmond
- Deschutes Basin Board of Control
- Deschutes River Conservancy
- Martha Pagel, attorney, Schwabe Williamson & Wyatt
- WaterWatch of Oregon

Comments from these stakeholders can be found on the Department's web page at http://www.oregon.gov/owrd/docs/comments_on_draft_HB_3623_report.pdf.

Concurrently, the draft report was also shared with the Department's Groundwater Advisory Committee (GWAC) on August 18, 2015. GWAC did not provide feedback on the draft report.

The Department has substantially incorporated the feedback provided by stakeholders in the attached draft report (Attachment 9). The Department is forwarding the updated draft report to stakeholders and providing a final opportunity for them to convey feedback to the Department by December 2, 2015.

The final report will be provided to the Oregon Legislature in February 2016. The Department will complete an evaluation of the Mitigation Program and update this report every five years on an ongoing basis. The sunset date for House Bill 3623 is currently January 2, 2029.

C. Summary

The Department's review of the Deschutes Groundwater Mitigation Program suggests that the Program is meeting its overall goals. However, with input provided by stakeholders, the Department has identified a number of potential programmatic improvements, which will also involve continued discussions with stakeholders and rulemaking. Identified programmatic improvements include:

- Develop a proactive process for addressing groundwater permit holders that fail to continue providing mitigation. Process improvements may also include rulemaking to strengthen the existing rule requirements for mitigation maintenance and identify clear process steps when mitigation discontinues.
- Explore with stakeholders, administrative rule changes to require holders of existing groundwater permits (that were issued after July 19, 1995, and before the Mitigation Program was adopted) to provide mitigation when seeking an extension on undeveloped portions of their permit.
- Continue progress on technical improvements. Specifically, the Department will continue working with US Geological Survey to update the Deschutes Groundwater Model that may help answer ongoing questions related to the Mitigation Program. Updates to this model may assist the Department in reviewing impacts of the Mitigation Program on springs, timing of mitigation, and the zones of impact.
- In addition, the Department will continue development of a database for tracking Program data that will provide a better system for housing information about the Mitigation Program, improve our ability to generate and evaluate reports, and respond to information requests from the public.

Department staff will also follow up with stakeholders to continue discussions on various issues raised, including but not limited to, establishment and use of mitigation credits, spring systems (including those in the Metolius River system), the 200 cfs allocation cap, and development of more up-to-date information about the Mitigation Program for those seeking new groundwater uses in the Deschutes Groundwater Study Area.

III. Conclusion

Part 1: Deschutes Groundwater Mitigation Program 2014 Annual Review

This is an informational report. No Commission action is required.

Part 2: House Bill 3623: Deschutes Groundwater Mitigation Program Evaluation

This is an informational update to the Commission on the progress of developing the House Bill 3623 report and issues identified to date. The Department welcomes input from the Commission on the report and identified recommendations for process improvements and rulemaking.

Attachments:

1. Deschutes Ground Water Study Area Zone of Impact Map
2. Comments provided by ODFW on the draft 2014 Annual Evaluation of the Mitigation Program
3. Status of Pending Groundwater Applications
4. Summary of Permits with Incremental Development Plans
5. Mitigation Water Established and Used in 2014
6. Summary of Mitigation Obligations and Use Levels for 2014
7. Summary of Mitigation Activity for 2014
8. Summary of Streamflow for Water Year Ending September 2014
9. Deschutes Groundwater Mitigation Program: Draft House Bill 3623 Report

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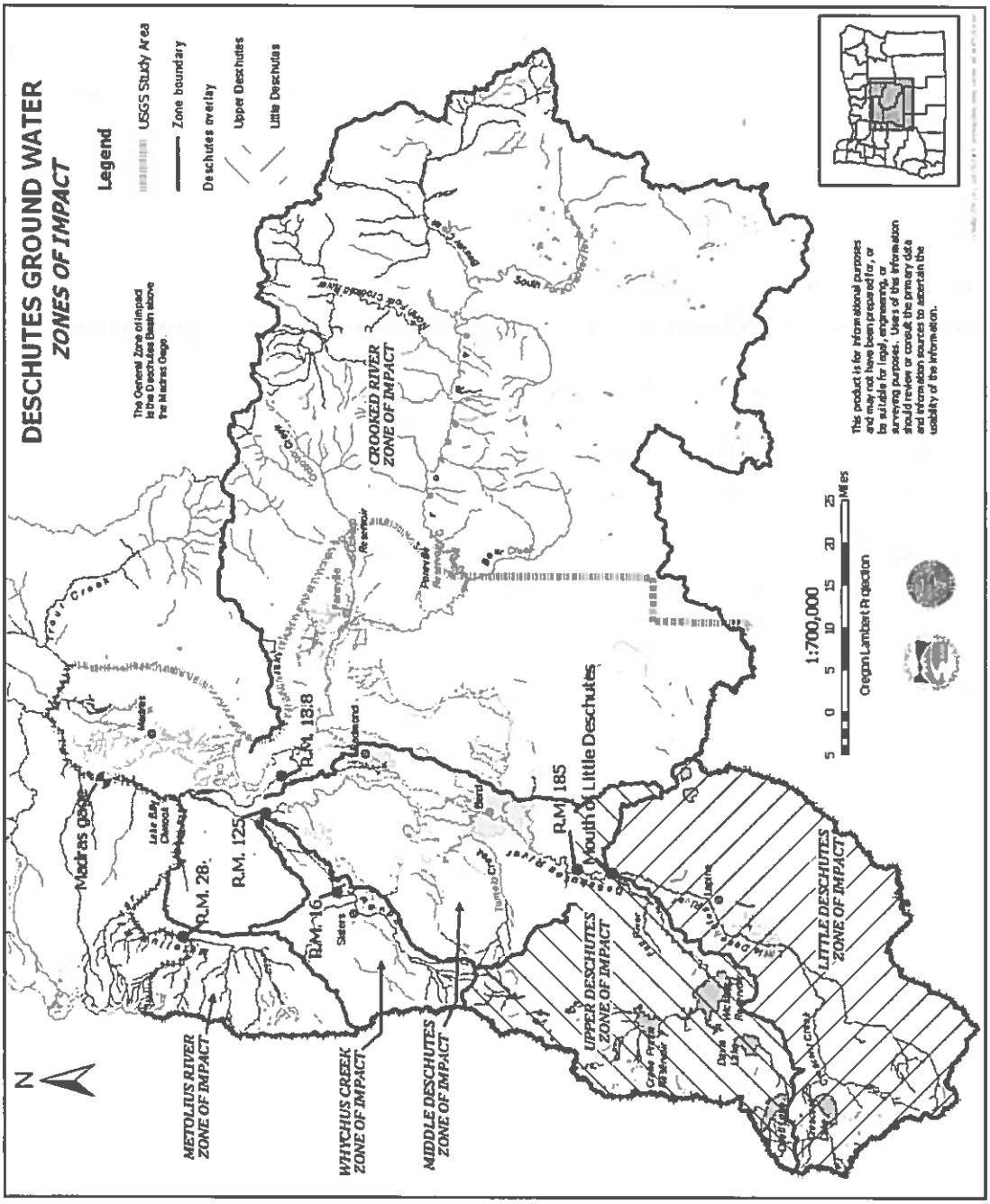
Deschutes Groundwater Study Area Zone of Impact Map



Attachment 2

Oregon
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October 9, 2015

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RE: Deschutes Basin Groundwater Mitigation Program 2014 Draft Annual Report

Dear Ms. Wilke,

The Oregon Department of Fish and Wildlife (ODFW) appreciates the opportunity to comment on the Deschutes Basin Ground Water Mitigation Program 2014 Draft Annual Report. ODFW believes the program has been successful in maintaining and improving flows in the Middle and Lower Deschutes River during the irrigation season. Increases in stream flow 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. ODFW believes the Oregon Water Resources Department (OWRD) has successfully implemented the Deschutes Ground Water Mitigation Rules and Deschutes Basin Mitigation Bank and Mitigation Credit Rules.

However, ODFW does have the following concerns with the Mitigation Program that we have expressed in the past and will reiterate now:

1. As currently designed, the Deschutes Groundwater Mitigation Program mitigates year-round groundwater withdrawals with irrigation season water. This type of mitigation does provide for more instream water during the irrigation season, but also will eventually reduce flows in the lower river during the non-irrigation season. All parties recognized this effect of the Program when the rules were developed. One of the reasons for the 200 cfs cap was to limit flow reduction impacts in the lower river outside of the irrigation season. All stakeholders recognized that non-irrigation flow concerns still needed to be addressed for the Deschutes basin as a whole.

   Stream flows outside the irrigation season are important to fish for a number of reasons, including providing habitat for spawning, rearing habitat throughout the year, and especially for spring outmigrating salmon and steelhead beginning in March and continuing through May.

2. ODFW recommends modifying the presentation of flow data. The annual reports for the Deschutes Ground Water Mitigation Program consistently present flow data on a monthly and annual basis, which demonstrate minor changes in flow. 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 flow data in a form that is more relevant to fish needs, such as improvements in low flows, variability in flows throughout the year, and flows during critical time periods for fish.

3. ODFW supports maintaining the 200 cfs allocation cap 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. 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). ODFW would like OWRD and program partners to work with us to seek options for year-round mitigation to offset year-round impacts. One option would be to forgo some stored water in Wickiup, Crane Prairie, Crescent, and other reservoirs during the non-irrigation season. This would better mitigate for the impacts of groundwater withdrawal on a true 1:1 basis.

4. ODFW is pleased to see that the majority of mitigation is being provided through permanent instream transfers but remains concerned with the number of permanent groundwater rights being mitigated with temporary leased water. This could set up the potential in the future to not have enough mitigation water to cover all the permanent groundwater rights that need mitigated. ODFW proposes that OWRD and program partners work more proactively to provide permanent mitigation water (permanent instream transfers) to offset groundwater pumping. 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. Annual reports continue to identify permit holders that have allowed temporary credits to expire while continuing to irrigate. ODFW supports WRD's goal of developing a "more robust and clear process for addressing permits without mitigation" and recommends WRD increase compliance monitoring and immediate regulation of non-compliant participants.

5. ODFW would also like to raise awareness of the potential impacts from the Mitigation Program to the recently ESA-listed Oregon Spotted Frog (OSF). The presence of an additional listed species within the Deschutes Ground Water Mitigation Area elevates the concerns ODFW has raised on the Program and our concern for the impact on the recovery of this threatened species. Improving winter flows on the upper Deschutes River below Wickiup Reservoir and on Crescent Creek is essential to the survival of the OSF, and the Program does not currently mitigate for flow impacts during the non-irrigation season. In addition, freshwater spring habitats in the upper Deschutes Basin have been determined to be critical to overwinter survival of the OSF. The Program annual reports

repeatedly state, "New groundwater uses produce a decrease in streamflow that is uniformly distributed over the year while mitigation projects generally increase streamflow only during the irrigation season." This continual detrimental impact to streamflow during the non-irrigation season is now a greater concern for more than just the "shoulder months." Again, ODFW would like OWRD and program partners to proactively seek options for year-round mitigation to offset the year-round impacts. One option would be to forgo some stored water in Wickiup, Crane Prairie, Crescent, and other reservoirs during the non-irrigation season to better mitigate for the impacts of groundwater withdrawal.

6. Although not included in the Mitigation Program but related to the increase in groundwater use in the basin, ODFW continues to have 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 cool stream temperatures during the summer in streams with depleted flows. While the water currently provided through mitigation has improved conditions during the irrigation season for fish and aquatic life in certain reaches relative to pre-mitigation program conditions, it is mostly warmer water from storage and does not yield equitable benefits compared to cool spring water. 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.

   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. Monitoring impacts of groundwater pumping on springs and spring complexes is important in 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 faded due to other priorities. ODFW would like to re-engage on the spring flow concerns and is willing to work with other agencies to seek funding, coordinate efforts for research, and develop and implement a strategy to address spring flow reductions.

Thank you for the chance to comment. If you have any questions, please contact me at (503) 947-6092 or Brett Hodgson at (541) 388-6363.

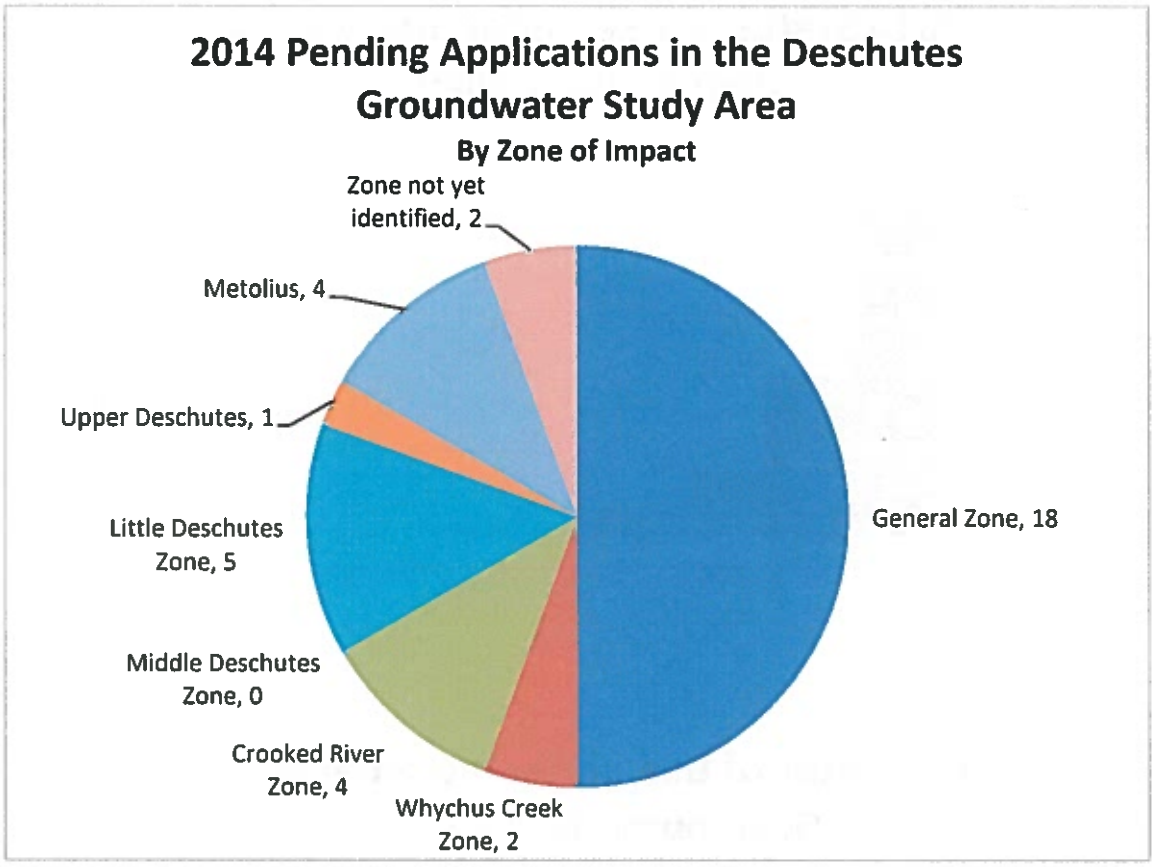
Sincerely,

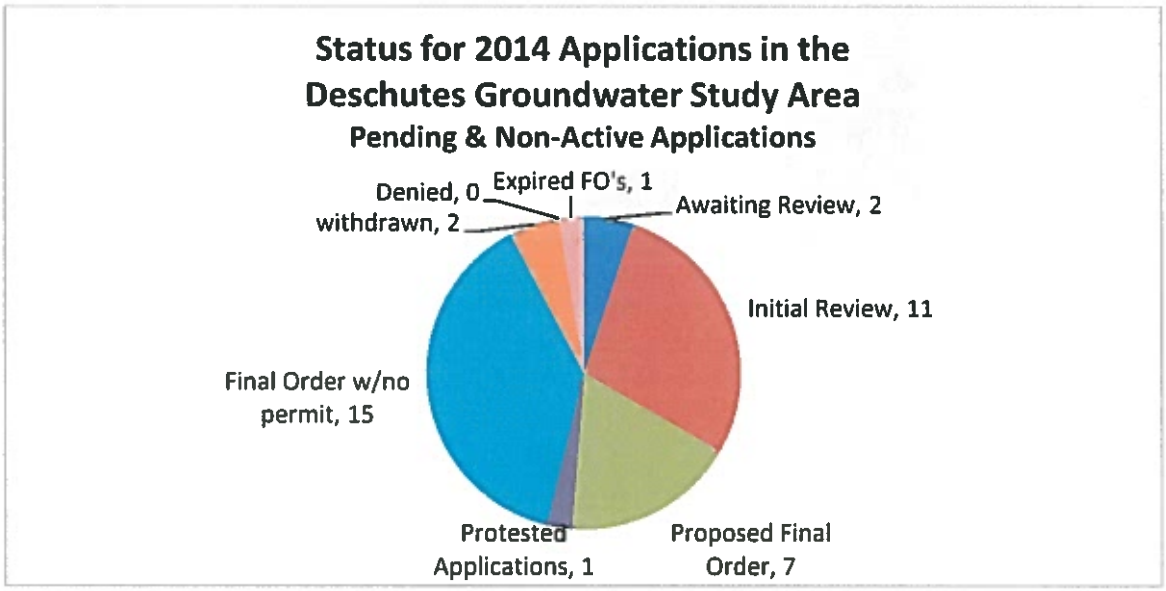
Danette L Faucera

Danette Faucera

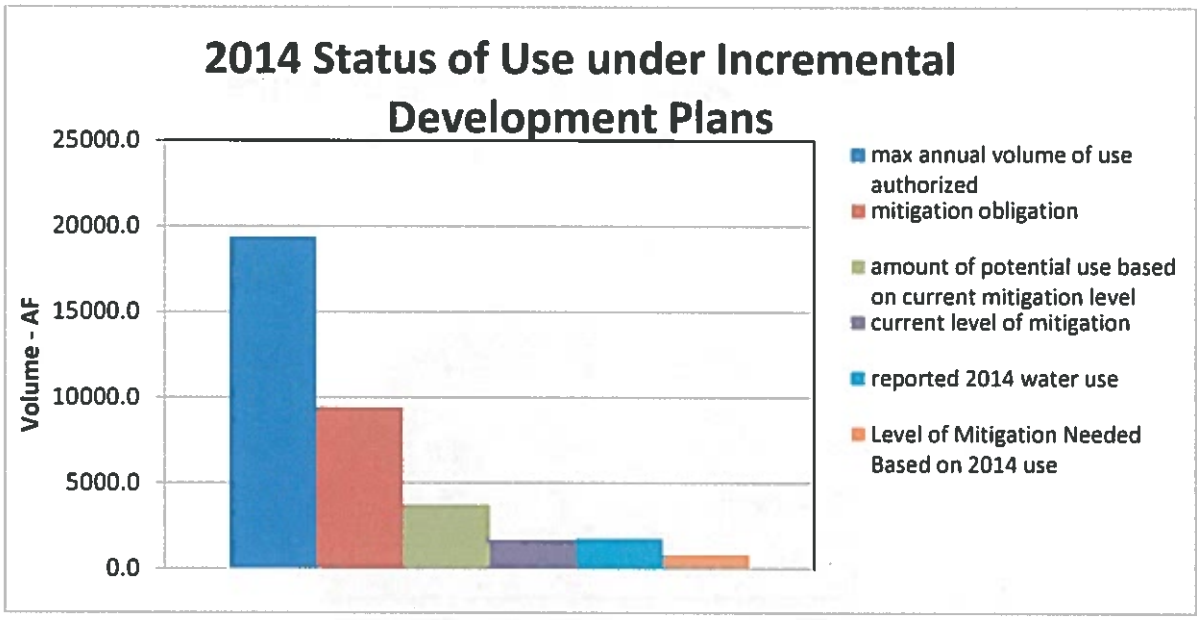
Water Policy Coordinator

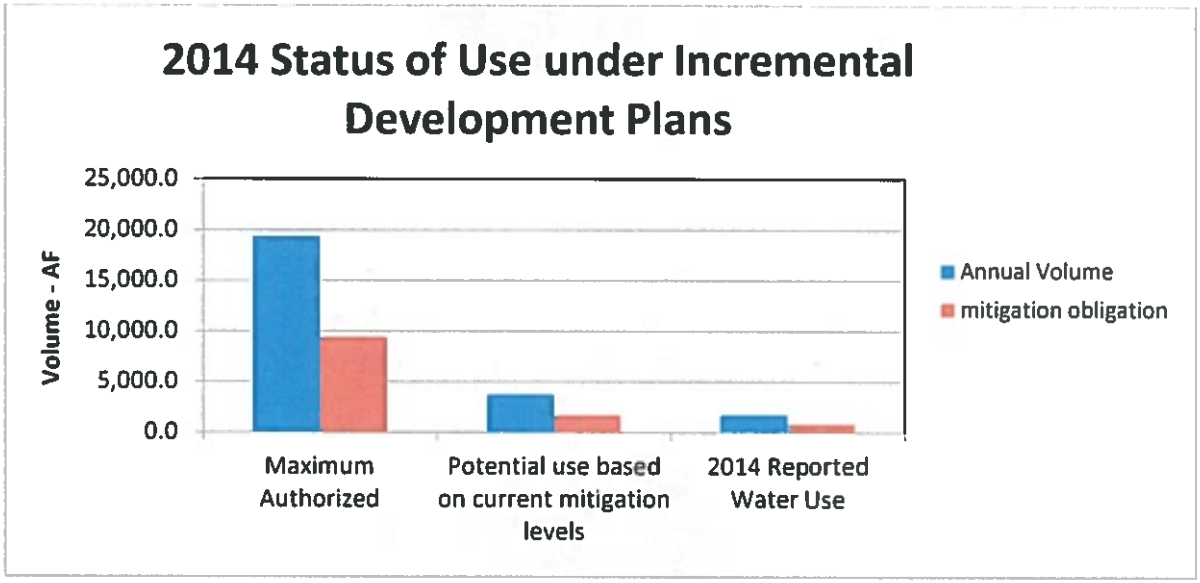
Status of Pending Groundwater Applications as of 12/31/2014



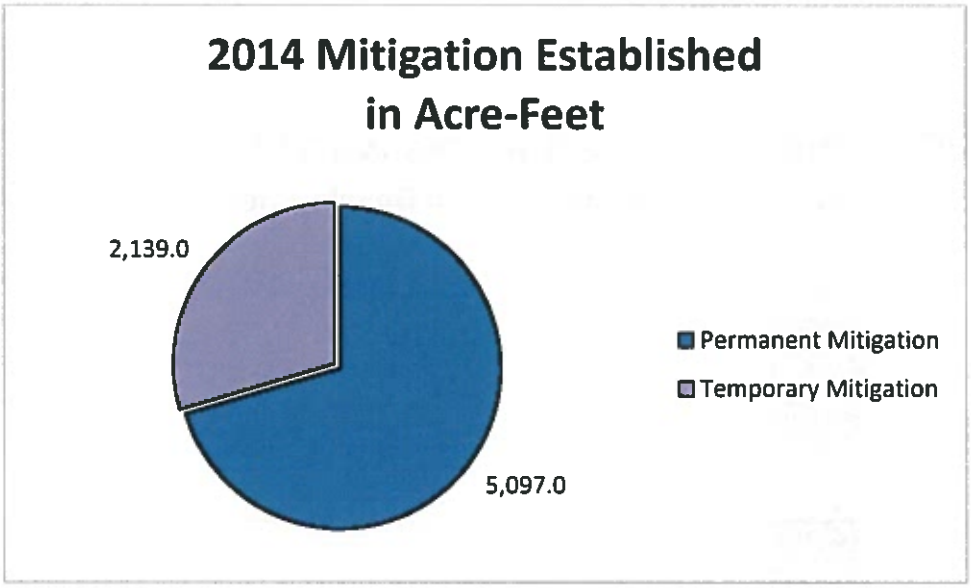


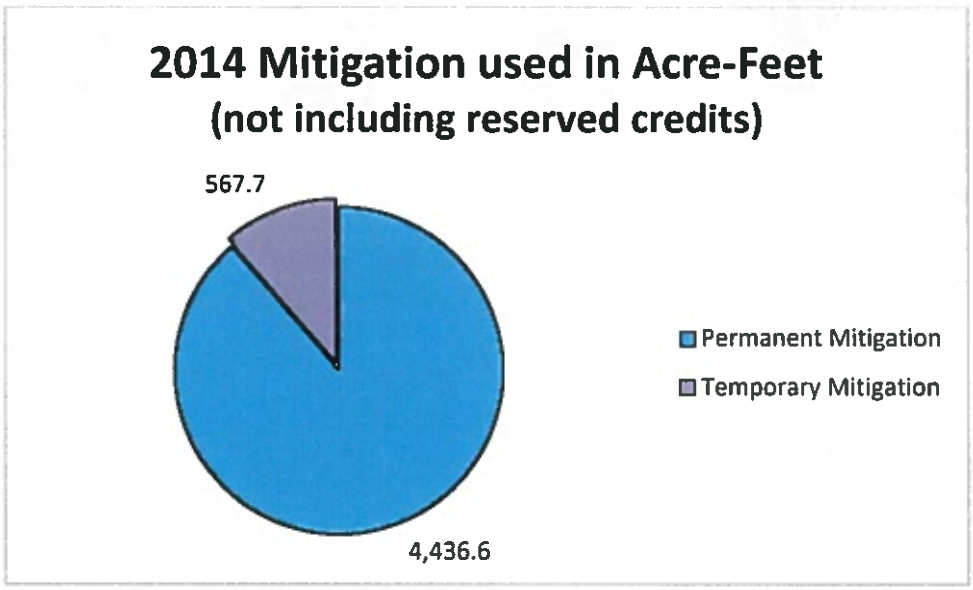
Summary of Permits with Incremental Development Plans



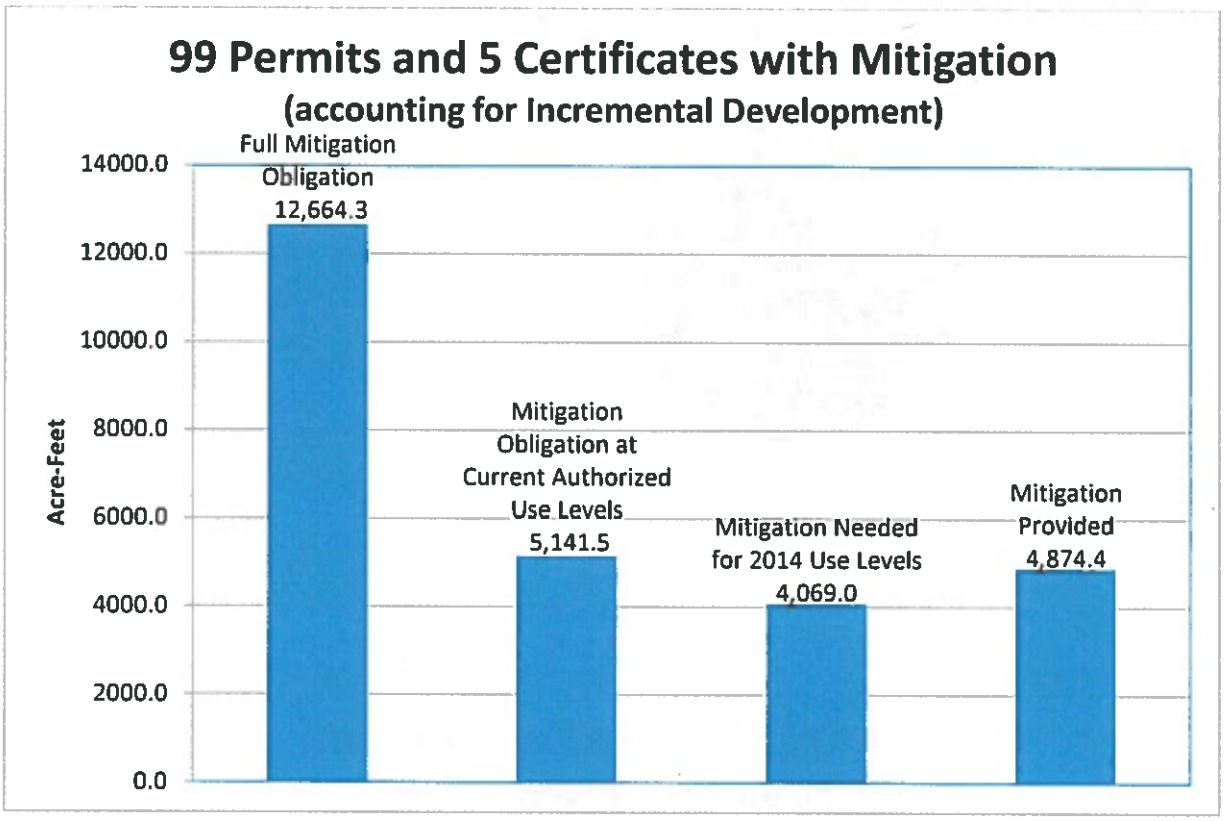


Mitigation Water Established and Used in 2014

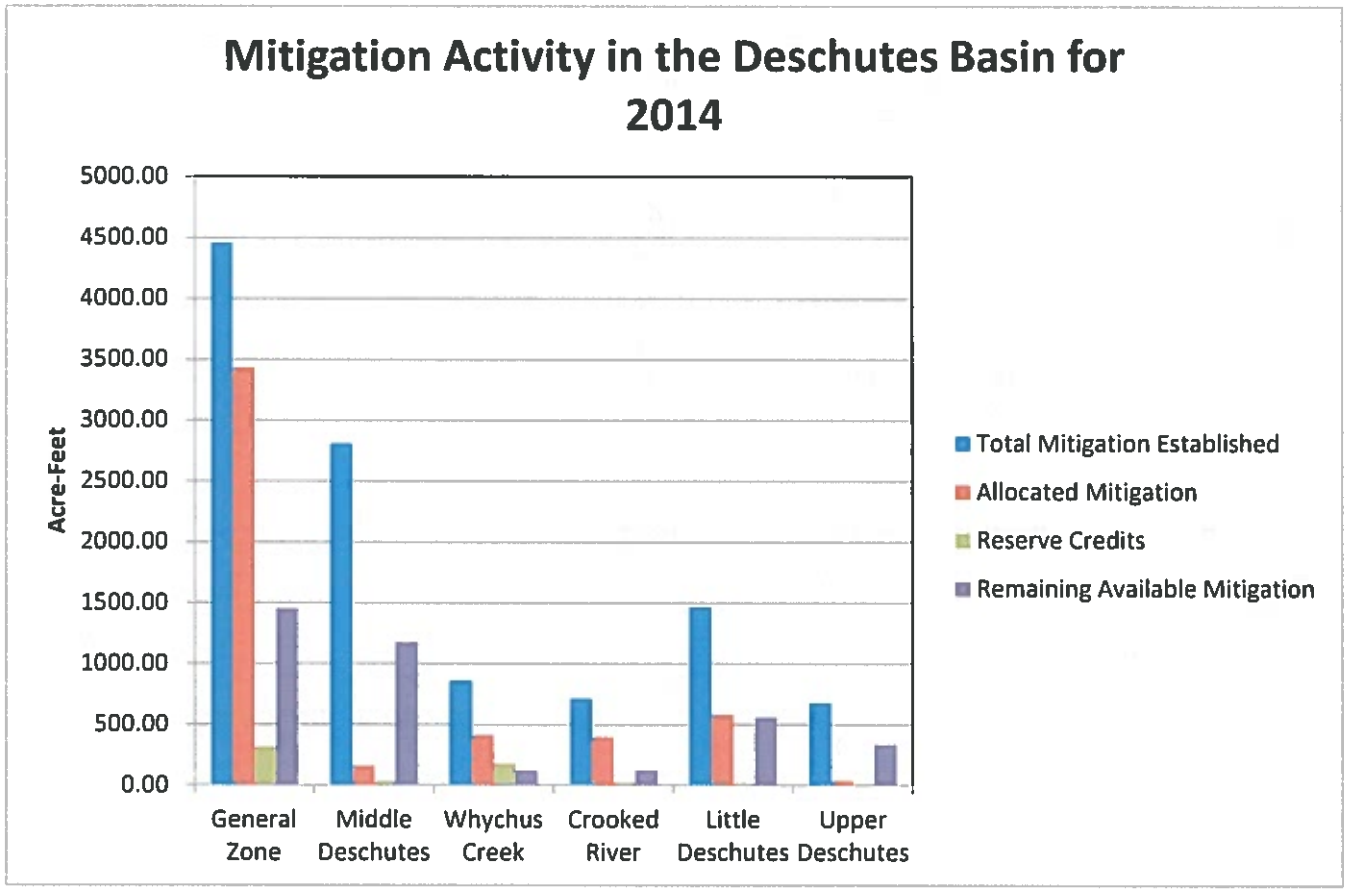




Summary of Mitigation Obligations and Use Levels for 2014



Summary of Mitigation Activity for 2014



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

Effective Date: 9/30/2014

Deschutes River at Mouth

Time: 14:44 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	93.20	93.10	-0.11
February	90.80	90.40	-0.35
March	95.30	95.10	-0.22
April	99.90	99.60	-0.33
May	99.10	99.10	0.00
June	98.00	98.70	+0.67
July	91.00	92.00	+1.08
August	100.00	100.00	0.00
September	98.10	98.10	0.00
October	97.40	97.40	0.00
November	99.90	99.90	0.00
December	91.70	91.10	-0.64
Annual	96.20	96.20	+0.01

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

Effective Date: 9/30/2014

Deschutes River at Mouth

Time: 14:44 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	6910.00	6890.00	-22.50	-0.33
February	7080.00	7060.00	-22.50	-0.32
March	7250.00	7220.00	-22.30	-0.31
April	6640.00	6630.00	-4.25	-0.06
May	5800.00	5810.00	+11.30	+0.19
June	5200.00	5220.00	+23.10	+0.44
July	4590.00	4610.00	+24.80	+0.54
August	4380.00	4400.00	+23.80	+0.54
September	4430.00	4450.00	+15.60	+0.35
October	4710.00	4710.00	+4.39	+0.09
November	5390.00	5370.00	-22.10	-0.41
December	6190.00	6160.00	-22.50	-0.36
Annual	5710.00	5710.00	-0.97	-0.02

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

Effective Date: 9/30/2014

Deschutes River below Pelton Dam

Time: 14:45 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	64.70	64.10	-0.64
February	63.00	62.20	-0.83
March	67.80	66.90	-0.97
April	71.40	70.70	-0.78
May	58.80	62.30	+3.44
June	55.60	59.10	+3.56
July	41.00	42.70	+1.72
August	98.20	99.00	+0.86
September	66.80	67.60	+0.78
October	81.10	81.10	0.00
November	97.20	97.20	0.00
December	66.10	65.50	-0.64
Annual	69.30	69.90	+0.55

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

Effective Date: 9/30/2014

Deschutes River below Pelton Dam

Time: 14:45 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	5240.00	5220.00	-22.50	-0.43
February	5190.00	5170.00	-22.50	-0.43
March	5520.00	5500.00	-22.30	-0.41
April	5130.00	5130.00	-4.25	-0.08
May	4420.00	4430.00	+11.30	+0.25
June	4230.00	4250.00	+23.10	+0.55
July	4020.00	4040.00	+24.80	+0.61
August	3940.00	3960.00	+23.80	+0.60
September	3980.00	3990.00	+15.60	+0.39
October	4190.00	4190.00	+4.39	+0.10
November	4680.00	4660.00	-22.10	-0.47
December	5030.00	5010.00	-22.50	-0.45
Annual	4630.00	4630.00	-0.97	-0.02

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

Effective Date: 9/30/2014

Metolius River at Lake Billy Chinook

Time: 14:46 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	97.70	97.70	0.00
February	99.20	99.20	0.00
March	99.80	99.80	0.00
April	100.00	100.00	0.00
May	100.00	100.00	0.00
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	100.00	100.00	0.00
October	100.00	100.00	0.00
November	100.00	100.00	0.00
December	100.00	100.00	0.00
Annual	99.70	99.70	0.00

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

Effective Date: 9/30/2014

Metolius River at Lake Billy Chinook

Time: 14:47 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	1510.00	1510.00	0.00	0.00
February	1560.00	1560.00	0.00	0.00
March	1560.00	1560.00	0.00	0.00
April	1520.00	1520.00	0.00	0.00
May	1560.00	1560.00	0.00	0.00
June	1590.00	1590.00	0.00	0.00
July	1490.00	1490.00	0.00	0.00
August	1400.00	1400.00	0.00	0.00
September	1350.00	1350.00	0.00	0.00
October	1330.00	1330.00	0.00	0.00
November	1370.00	1370.00	0.00	0.00
December	1450.00	1450.00	0.00	0.00
Annual	1470.00	1470.00	0.00	0.00

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

Effective Date: 9/30/2014

Deschutes River at Lake Billy Chinook
Time: 14:49 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	100.00	100.00	0.00
February	100.00	100.00	0.00
March	100.00	100.00	0.00
April	97.10	99.80	+2.67
May	100.00	100.00	0.00
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	100.00	100.00	0.00
October	94.40	98.90	+4.57
November	100.00	100.00	0.00
December	100.00	100.00	0.00
Annual	99.30	99.90	+0.60

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

Effective Date: 9/30/2014

Deschutes River at Lake Billy Chinook
Time: 14:49 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	1300.00	1290.00	-7.12	-0.55
February	1320.00	1310.00	-7.12	-0.54
March	1300.00	1290.00	-6.97	-0.54
April	843.00	854.00	+11.10	+1.30
May	552.00	578.00	+25.80	+4.47
June	606.00	642.00	+35.30	+5.50
July	550.00	587.00	+36.70	+6.25
August	519.00	555.00	+35.70	+6.43
September	537.00	565.00	+27.50	+4.87
October	725.00	742.00	+16.40	+2.22
November	1130.00	1120.00	-7.12	-0.64
December	1220.00	1210.00	-7.12	-0.59
Annual	881.00	894.00	+12.90	+1.44

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

Effective Date: 9/30/2014

Deschutes River at Lower Bridge

Time: 14:50 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	60.50	59.00	-1.51
February	63.80	62.50	-1.30
March	68.30	67.80	-0.43
April	23.60	24.10	+0.56
May	1.29	1.29	0.00
June	2.11	3.11	+1.00
July	0.11	0.54	+0.43
August	0.86	1.40	+0.54
September	3.67	4.00	+0.33
October	13.00	14.10	+1.08
November	52.20	50.90	-1.33
December	56.30	55.90	-0.43
Annual	28.60	28.60	-0.08

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

Effective Date: 9/30/2014

Deschutes River at Lower Bridge

Time: 14:50 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	683.00	682.00	-1.41	-0.21
February	705.00	704.00	-1.41	-0.20
March	714.00	712.00	-1.41	-0.20
April	299.00	311.00	+12.40	+3.98
May	51.20	77.50	+26.40	+34.00
June	50.50	85.30	+34.80	+40.80
July	42.60	80.10	+37.50	+46.80
August	46.20	83.20	+37.00	+44.50
September	61.00	90.10	+29.10	+32.30
October	222.00	242.00	+20.50	+8.46
November	551.00	549.00	-1.41	-0.26
December	614.00	613.00	-1.41	-0.23
Annual	335.00	351.00	+16.00	+4.56

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

Effective Date: 9/30/2014

Deschutes River above Diversion Dam at Bend
Time: 14:51 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	37.30	37.20	-0.11
February	40.00	39.60	-0.47
March	42.90	42.30	-0.64
April	73.20	73.40	+0.11
May	97.00	97.30	+0.32
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	97.00	97.80	+0.78
October	54.60	56.10	+1.51
November	29.00	28.80	-0.22
December	35.70	35.50	-0.22
Annual	67.40	67.40	+0.09

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

Effective Date: 9/30/2014

Deschutes River above Diversion Dam at Bend
Time: 14:51 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	712.00	711.00	-1.38	-0.19
February	738.00	737.00	-1.38	-0.19
March	781.00	779.00	-1.38	-0.18
April	877.00	880.00	+3.57	+0.41
May	1180.00	1190.00	+9.61	+0.81
June	1360.00	1370.00	+13.20	+0.97
July	1440.00	1450.00	+16.20	+1.11
August	1290.00	1300.00	+15.60	+1.20
September	1090.00	1100.00	+12.60	+1.14
October	721.00	728.00	+7.59	+1.04
November	590.00	589.00	-1.38	-0.23
December	650.00	648.00	-1.38	-0.21
Annual	953.00	959.00	+6.00	+0.62

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

Effective Date: 9/30/2014

Deschutes River at Benham Falls

Time: 14:52 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	43.40	43.30	-0.11
February	54.50	54.50	0.00
March	32.50	31.40	-1.08
April	69.60	69.30	-0.22
May	78.10	78.10	0.00
June	92.60	92.60	0.00
July	96.80	96.80	0.00
August	94.50	94.60	+0.11
September	67.80	67.90	+0.11
October	54.00	54.00	0.00
November	35.90	35.70	-0.22
December	44.60	44.60	0.00
Annual	63.70	63.60	-0.12

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

Effective Date: 9/30/2014

Deschutes River at Benham Falls

Time: 14:52 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	814.00	813.00	-1.33	-0.16
February	845.00	844.00	-1.33	-0.16
March	901.00	900.00	-1.33	-0.15
April	1240.00	1240.00	-1.33	-0.11
May	1850.00	1850.00	+0.602	+0.03
June	2100.00	2100.00	+1.82	+0.09
July	2200.00	2210.00	+4.74	+0.22
August	2040.00	2040.00	+4.18	+0.20
September	1730.00	1740.00	+3.66	+0.21
October	1000.00	1010.00	+3.09	+0.31
November	685.00	684.00	-1.33	-0.19
December	752.00	750.00	-1.33	-0.18
Annual	1350.00	1350.00	+0.861	+0.06

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

Effective Date: 9/30/2014

Little Deschutes River at mouth

Time: 14:52 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	22.90	20.80	-2.15
February	37.30	34.60	-2.72
March	27.40	27.10	-0.32
April	45.20	44.90	-0.33
May	55.90	55.80	-0.11
June	56.60	57.20	+0.67
July	85.10	87.50	+2.47
August	93.90	94.30	+0.43
September	72.00	73.30	+1.33
October	11.60	12.90	+1.29
November	14.70	14.00	-0.67
December	20.30	19.70	-0.64
Annual	45.30	45.20	-0.05

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

Effective Date: 9/30/2014

Little Deschutes River at mouth

Time: 14:52 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	162.00	161.00	-1.33	-0.83
February	183.00	182.00	-1.33	-0.73
March	219.00	218.00	-1.33	-0.61
April	262.00	261.00	-1.33	-0.51
May	329.00	329.00	+0.602	+0.18
June	298.00	300.00	+1.82	+0.61
July	230.00	235.00	+4.74	+2.02
August	200.00	204.00	+4.18	+2.05
September	144.00	147.00	+3.66	+2.49
October	76.70	79.80	+3.09	+3.87
November	108.00	107.00	-1.33	-1.24
December	142.00	141.00	-1.33	-0.94
Annual	196.00	197.00	+0.861	+0.44

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

Effective Date: 9/30/2014

Deschutes River above Little Deschutes River

Time: 14:53 Date: 04/13/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	29.70	29.70	0.00
February	30.10	30.10	0.00
March	33.50	33.50	0.00
April	68.40	68.40	0.00
May	97.80	97.80	0.00
June	98.80	98.80	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	99.80	99.80	0.00
October	56.80	56.80	0.00
November	20.90	20.90	0.00
December	24.70	24.70	0.00
Annual	63.50	63.50	0.00

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

Effective Date: 9/30/2014

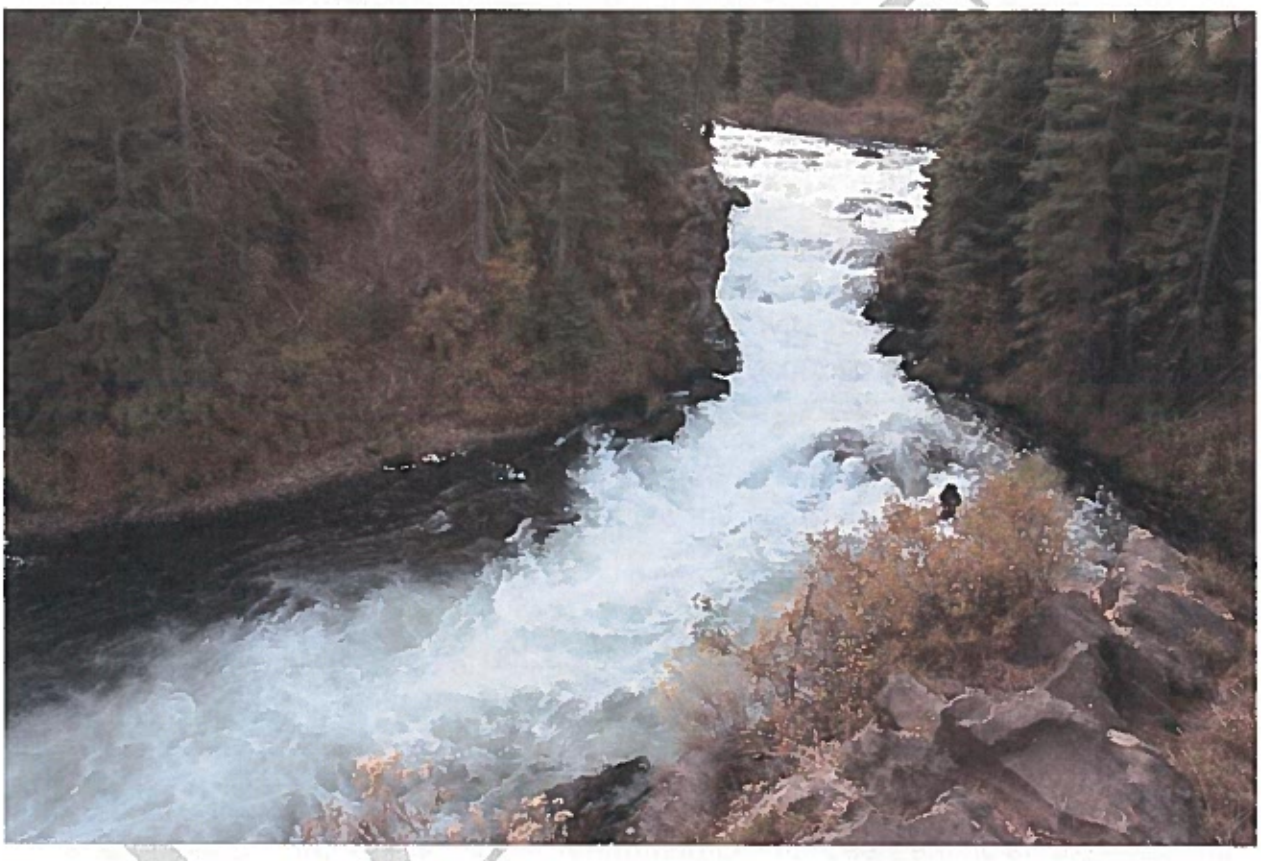
Deschutes River above Little Deschutes River

Time: 14:53 Date: 04/13/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	329.00	329.00	0.00	0.00
February	331.00	331.00	0.00	0.00
March	319.00	319.00	0.00	0.00
April	654.00	654.00	0.00	0.00
May	1220.00	1220.00	0.00	0.00
June	1500.00	1500.00	0.00	0.00
July	1690.00	1690.00	0.00	0.00
August	1530.00	1530.00	0.00	0.00
September	1260.00	1260.00	0.00	0.00
October	561.00	561.00	0.00	0.00
November	246.00	246.00	0.00	0.00
December	280.00	280.00	0.00	0.00
Annual	829.00	829.00	0.00	0.00

Deschutes Ground Water Mitigation Program:

House Bill 3623 (Chapter 694, 2011 Oregon Laws) Report



February 2016 (DRAFT 11-5-2015)

State of Oregon
Water Resources Department

Deschutes Ground Water Mitigation Program: House Bill 3623 Report

House Bill 3623 Requirements

House Bill 3623 (Chapter 694, 2011 Oregon Laws) directs the Oregon Water Resources Department (OWRD) to report to the Legislative Assembly every five years on outcomes of the Department's Mitigation Program for the Deschutes Basin groundwater study area.

The 2011 act requires that the report include a summary of:

House Bill 3623 also requires the Department to periodically review the Mitigation Program for the Deschutes Basin groundwater study area. This review is required to include:

In development of this report, on January 23, 2015, the Department solicited feedback from stakeholders on the Deschutes Groundwater Mitigation Program. Stakeholders provided feedback on review elements required under House Bill 3623 and identified a number of additional issues. Stakeholder feedback was provided by:

- Central Oregon Irrigation District
- Central Oregon Land Watch
- City of Bend
- Deschutes River Conservancy
- Friends of the Metolius
- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Martha Pagel, attorney, Schwabe, Williamson & Wyatt
- Water Right Services, consultant
- WaterWatch of Oregon

The initial feedback provided by these stakeholders can be found on the Department's web page at: http://www.oregon.gov/owrd/docs/HB_3623_Stakeholder_Feedback.pdf.

Using feedback provided by these stakeholders, the Department's tracking tools for the Mitigation Program, including the Deschutes Streamflow Model, and technical and local staff input; the Department developed an initial draft report that was shared with stakeholders and the Department's Groundwater Advisory Committee on August 17, 2015, with a request for comments on the draft report. Comments on the draft report were provided by:

- Bureau of Land Management
- Central Oregon Land Watch
- City of Bend
- City of Prineville
- City of Redmond
- Deschutes Basin Board of Control
- Deschutes River Conservancy
- Martha Pagel, attorney, Schwabe Williamson & Wyatt
- WaterWatch of Oregon

These comments can also be found on the Department's web page at: http://www.oregon.gov/owrd/docs/comments_on_draft_HB_3623_report.pdf.

An updated draft was provided to the Department's Commission for review at the November 19, 2015, Oregon Water Resources Commission meeting. The Department also shared this update draft with stakeholders and provided an additional opportunity to convey additional feedback to the Department.

DRAFT

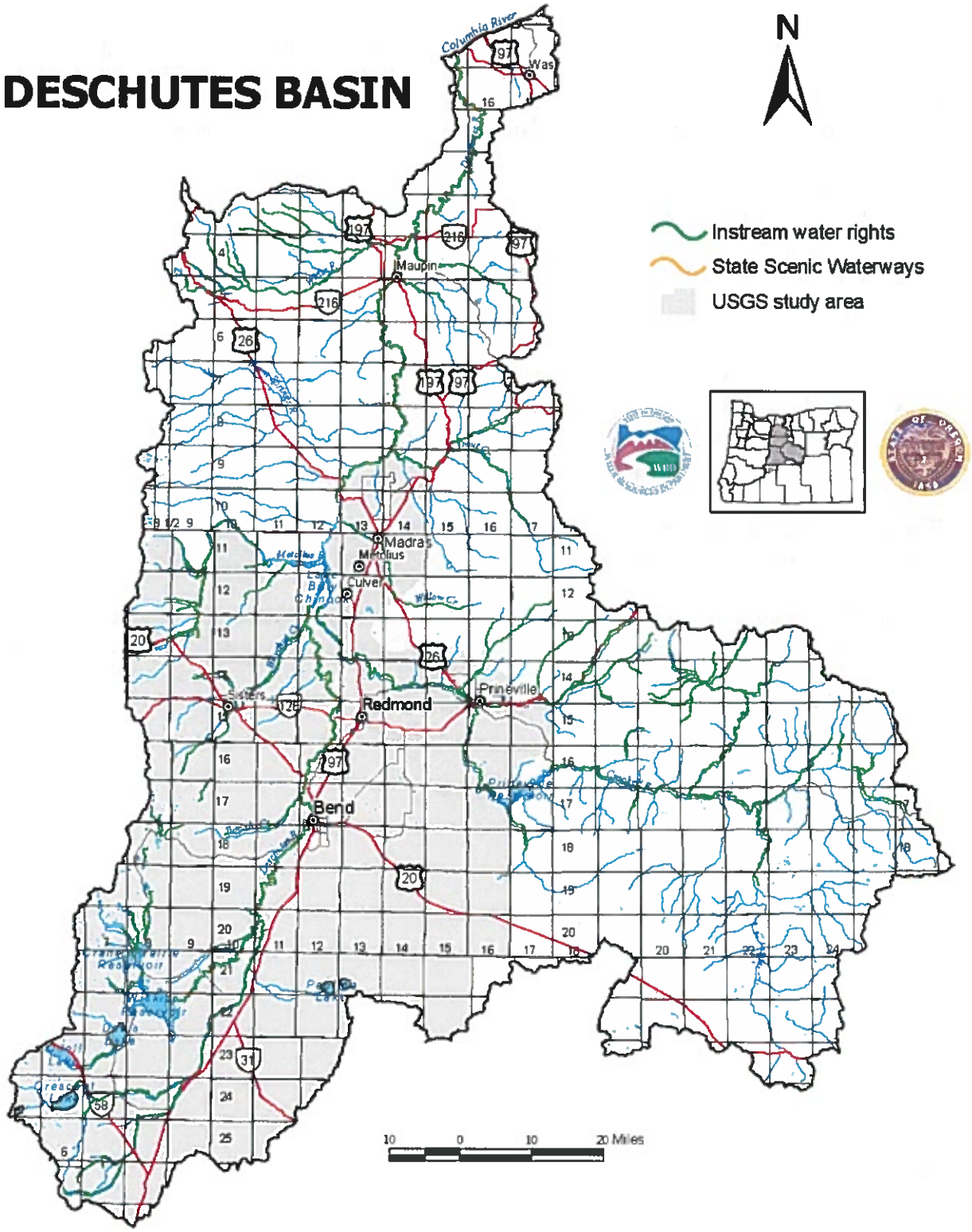


Figure A: Deschutes Basin Groundwater Study Area

OWRD GIS (rh), 1/8/2008, des/deschgs_USGS_ISWR_SSW.mxd

Background

In the Deschutes Basin above Lake Billy Chinook, a groundwater study was conducted in the late 1990's by the US Geological Survey (USGS) in cooperation with OWRD and others. The groundwater study concluded that there is a hydraulic connection between ground water and surface water in the Deschutes Basin above Lake Billy Chinook, specifically in an area called the Deschutes Ground Water Study Area (DGWSA). Because of this connection, ground water withdrawals within this area affect surface water flows in the Deschutes River and its tributaries. The Deschutes River is a designated state scenic waterway. In addition, flows in the Deschutes River and many of its tributaries are protected by instream water rights. There are not always sufficient flows in the Deschutes River and its tributaries to meet instream water right and scenic waterway flows.

Under the Scenic Waterway Act (ORS 390.835), withdraw of hydraulically connected groundwater, with a few exceptions, is prohibited within or above a scenic waterway. New groundwater use permits can be issued only when they do not individually or cumulatively measurably reduce scenic waterway flows or the effects can be mitigated. Measurable reduction is either 1% of the average daily flows or 1 cubic foot per second (cfs), whichever is less. For the Deschutes River, the amount of measurable reduction allowed is 1 cfs. This limitation has been met.

Since flows for instream water rights are not always met and additional groundwater use would further reduce scenic waterway flows, OWRD may not approve new groundwater permits in the DGWSA unless the impacts are mitigated with a similar amount of water being put instream. The Deschutes Groundwater Mitigation Program provides a set of tools that applicants for new groundwater permits within the DGWSA can use to establish mitigation and, thereby, obtain new permits from OWRD. This program is implemented under Oregon Administrative Rules (OAR) Chapter 690, Divisions 505, 521, and 522.

The amount of new groundwater use that can be approved under the Mitigation Program is limited to a total of 200 cfs, often referred to as the allocation cap. Since adoption of the Deschutes Mitigation rules in September 2002 and by year end 2014, OWRD has issued 108 new groundwater permits with associated mitigation, totaling 123 cfs of water. In addition to the 123 cfs allocated, there is approximately 12 cfs in pending applications with approved final orders and approximately another 32.9 cfs associated with additional pending applications. Assuming all pending applications move forward as proposed, there will still be approximately 32 cfs left under the 200 cfs allocation cap. Once the allocation cap limit is met, no additional permits can be issued without the Water Resources Commission modifying its rules and adjusting the cap.

The Department maintains an accounting record of new groundwater permits and associated mitigation with links between the groundwater permits and their source of mitigation. Overall, for each year the program has been in place, there has been sufficient mitigation water available to meet the needs of the groundwater permits

issued under the program (see Figure B for a distribution of permits, authorized quantity in cfs, current consumptive use levels in acre-feet, and mitigation credits (MC) by zone of impact for 2014). However, there may not always be sufficient supplies of mitigation water available to satisfy the mitigation needs of all currently pending ground water use requests. Additionally, there are areas of the basin where mitigation has not been readily available. In the early years of the Mitigation Program, much of the mitigation was temporary in nature (in the form of annual instream leases of existing irrigation water rights). Mitigation based on instream leases still represents a large portion of the mitigation available annually. However, the amount of permanent mitigation water available has increased steadily each year of the program.

The key goals of the Groundwater Mitigation Program are to:

- Maintain flows for Scenic Waterways and senior water rights, including instream water rights;
- Facilitate restoration of flows in the middle reach of the Deschutes River and related tributaries; and
- Sustain existing water uses and accommodate growth through new groundwater development (OWRD, 2008).

The Mitigation Program has five basic elements:

- Requires mitigation for all new groundwater permits in the Deschutes Ground Water Study Area;
- Identifies tools for providing mitigation water through either a mitigation project or by obtaining mitigation credits from an established mitigation project;
- Establishes a system of mitigation credits, which may be used to mitigate for new groundwater permits;
- Provides the process to establish mitigation banks; and
- Provides for adaptive management through annual evaluations and review of the Program every five years (OWRD, 2008 and 2014).

The Deschutes Basin Groundwater Mitigation program has been successful in meeting the key goals of the program. Through mitigation, scenic waterway and instream water right flows have been maintained and, in some areas, have been improved. The benefits of the program have been significant in some areas, such as the flows restored in the Deschutes River below Bend. Overall, as a result of the program, more than 61 cfs of instream flow has been restored to the Deschutes River and its tributaries.

The mitigation program is working well but, like all regulatory programs, has room for improvement. This review of the Mitigation Program has identified a variety of opportunities to improve the Program. The Department also intends to continue conversations with its stakeholders to identify and explore opportunities to continue improving the Program so that it continues to work well into the future.

The water management issues in the Deschutes Basin are complex – municipal, instream, irrigation, and recreation interests all have a stake in successful outcomes.

The Department's Mitigation Program is a small but important piece of overall Basin water management.

Program Impacts on Other Water Users of the Deschutes River Basin

Much of the mainstem Deschutes River and its tributaries are protected by scenic waterway designations and instream water rights. There are also hundreds of existing surface water rights on the Deschutes River and its tributaries for out of stream uses, such as irrigation and municipal uses.

The Deschutes Basin contains numerous small agricultural communities as well as still some of the fastest growing cities in the region or state. While the economy in some areas has shifted toward service industries and tourism, in other parts of the Basin farming and ranching remain important. Land use in the Deschutes Basin is characterized by numerous smaller, privately held parcels alongside larger areas owned and managed by Federal, State and Tribal agencies.

The Basin's economy relies heavily upon abundant, clean water. Surface water has been fully appropriated resulting in an increased reliance on groundwater as a source for future growth. Groundwater users include municipalities, irrigation districts, commercial developments, industrial users, homeowners associations, and other private water providers and landowners.

Anyone pursuing a new groundwater use in the DGWSA, that requires a water use permit, must mitigate for their groundwater use. The Deschutes Groundwater Mitigation Program provides a set of tools that groundwater permit applicants can use to establish new groundwater uses within the DGWSA while still protecting, through mitigation, scenic waterway flows, instream water rights and other surface water rights. Most mitigation for new groundwater use has come from the conversion of out of stream uses, such as irrigation, to instream use through a temporary instream lease or permanent instream transfer. Mitigation for a new groundwater permit must be provided for the life of that permit and subsequent certificate.

Other Water Rights

In general, use of water from any source of water in the Deschutes Basin requires a water right from the Oregon Water Resources Department. There are approximately 1945 surface water rights in the Deschutes Basin above Lake Billy Chinook, which includes the Crooked River sub-basin extending outside the DGWSA. There are also a small number of surface water rights on the Lower Deschutes River, below Lake Billy Chinook with uses including irrigation, domestic, industrial use and stock. These surface water rights include instream water rights on the Deschutes River and its tributaries within the DGWSA and the two instream water rights on the stretch of the Deschutes River below Lake Billy Chinook.

The Department does not have any evidence or information suggesting that the mitigation program has resulted in impact or injury to any other water rights, including instream water rights. WaterWatch disagreed with this statement. In another section of the report, the Department identifies that streamflows are affected by the Mitigation Program with increased flows during the irrigation season and decreased flows in the time period outside of the irrigation season. WaterWatch of Oregon identified that they consider this injury. However, a decrease in streamflows doesn't necessarily result in injury. Injury occurs when one or more senior appropriators, including instream water rights, are unable to use the quantity of water to which they are entitled as a result of use by a junior right. In those instances, the junior water use may be regulated off in favor of a senior use. To date, there's no information or evidence to suggest that the Mitigation Program has resulted in impact or injury to other water rights.

Property and Water Right Value

The Mitigation Program may have an effect on the value of water rights. The Mitigation Program has created a potential market for some surface water rights. Groundwater users needing to provide mitigation can either complete their own mitigation project or obtain mitigation credits from a mitigation credit holder, an individual or entity that has completed a mitigation project. The primary source of mitigation in the Deschutes Basin has involved surface water rights, primarily from irrigation use. Surface water rights have either been leased for instream use, through the Deschutes River Conservancy (DRC) Mitigation Bank, or transferred permanently to instream use by individuals or entities needing mitigation for a new groundwater use or wanting to establish mitigation credits, which can then later be sold to groundwater users needing mitigation. Thereby creating the market mentioned above.

Subsequently, it is possible that in some areas, the Mitigation Program has increased the value of surface water rights. Particularly in areas of the Basin where mitigation is generally in short supply. This may include the Crooked River Basin and the Upper Deschutes River Basin. In other areas, mitigation has primarily been provided by instream leases and/or instream transfers from water rights held by irrigation districts. Concern has also been expressed to the Department that the Mitigation Program may result in loss of water for agricultural lands and being used instead as a mitigation source for new groundwater users with "deep pockets." An alternative view, certain water right holders may or have been able to sell water rights for mitigation where they were not able to sell them previously.

In general, with or without the Mitigation Program, land with water rights may have a higher value than land without a water right. Of course, water rights are not the only factor affecting land value. In some cases, the scenic view, the size and development of the property, zoning, or another factor, may be more influential in land value.

Cities and other water providers

Within the DGWSA are the cities of Bend, Prineville, Sisters, LaPine, Madras, Redmond, Metolius, and Culver. There are also several private quasi-municipal water providers, including Avion Water Company and Deschutes Valley Water District. As previously noted, the primary water source of new and continued development in the DGWSA is groundwater. Without the Mitigation Program, municipal water providers (both public and private), may not be able to meet growing water demands.

When the Mitigation Program was first adopted, the DGWSA was home to some of the fastest growing cities in the region. Since then, the Basin, along with the rest of the United States, experienced an economic downturn and recession. Growth slowed down and in some cases stalled. However, in the last few years, the need for water to meet growing demands for many cities and communities has returned. The Department has completed evaluation of over 160 mitigation projects, which resulted in mitigation water. In the last 12 years the Department has issued 17 new groundwater permits to several cities and private water providers using a portion of the mitigation water established by those projects. The Department is currently in the process of evaluating an additional 14 permanent mitigation projects that will likely provide additional mitigation for the City of Bend, City of Redmond, City of Sisters, and the City of LaPine as well as several private water providers and other water users.

In their comments to the Department, the City of Bend identified that municipalities have a legal responsibility to provide their customers with a reliable source of water. Future water use planning, consistent with state law, is generally over a minimum of 20 years. It is important for municipalities to have a predictable and reliable mitigation program. In the years that the Mitigation Program has been in place, prior to the economic downturn, mitigation water users, including municipalities and irrigation districts, worked together and with OWRD to provide and obtain mitigation. Mitigation, according to the City of Bend, was relatively easy to initiate and acquire in the early years of the Mitigation Program. However, in recent years, they assert that some difficulties have been encountered with the Mitigation Program. These difficulties include the effects of the economic downturn, including irrigation districts being less willing or able to lease or transfer surface water rights to instream use. The City of Bend identified that mitigation, especially permanent mitigation, is more difficult to obtain. As part of the planning process for municipalities it is important to know the transaction costs and timing of mitigation availability. In particular, Bend cites the System Development Charges (SDCs), which allows growth related infrastructure investments to be shared with rate payers in a fair and equitable way, rather than just as rate increases. The City has identified that they have also found the mitigation project (instream transfer) process to be lengthy and complicated. This has affected rate making, SDC development, and water supply certainty.

When the Department first began reviewing mitigation projects for the Mitigation Program, the number of mitigation projects was smaller and only a few Department staff were dedicated to the Program. In the last two years, the Department has been

expanding the number of staff available to review mitigation projects. There are currently four staff members reviewing mitigation projects. The Department anticipates that this will increase efficiency and decrease the length of time between submission of a project to the Department and completion of the project.

WaterWatch of Oregon identified that mitigation needs for many cities within the Deschutes Groundwater Study Area may not be immediate and that the permits obtained under the Mitigation Program may last for decades. Central Oregon LandWatch also questioned the amount of additional mitigation that may be needed by the City of Bend given, as they identify, limited growth potential due to being encircled by Avion and Roats water systems, private water purveyors.

For the majority of the cities, including Bend, and other private water providers issued groundwater permits under the Mitigation Program, mitigation is being provided incrementally over a period of time as the water use is developed. In general, to obtain a groundwater permit, mitigation must be in place before the permit may be issued. However, municipal and quasi-municipal permit applicants may request to provide mitigation incrementally under an incremental development plan, which is on file with the Department and may be modified upon request. They are allowed to match the amount of mitigation provided to the rate of growth under the permit. Date ranges under plans currently on file with the Department range from the smallest at 5 years to the largest at 50 years. Most appear to be in the range of 20 to 30 years. To date, there generally has not been a shortage of mitigation credits available to meet demand except within a few zones of impact.

Irrigation Districts

A large percent of the mitigation water established annually and permanently in the DGWSA originates from water rights held by irrigation districts (District).

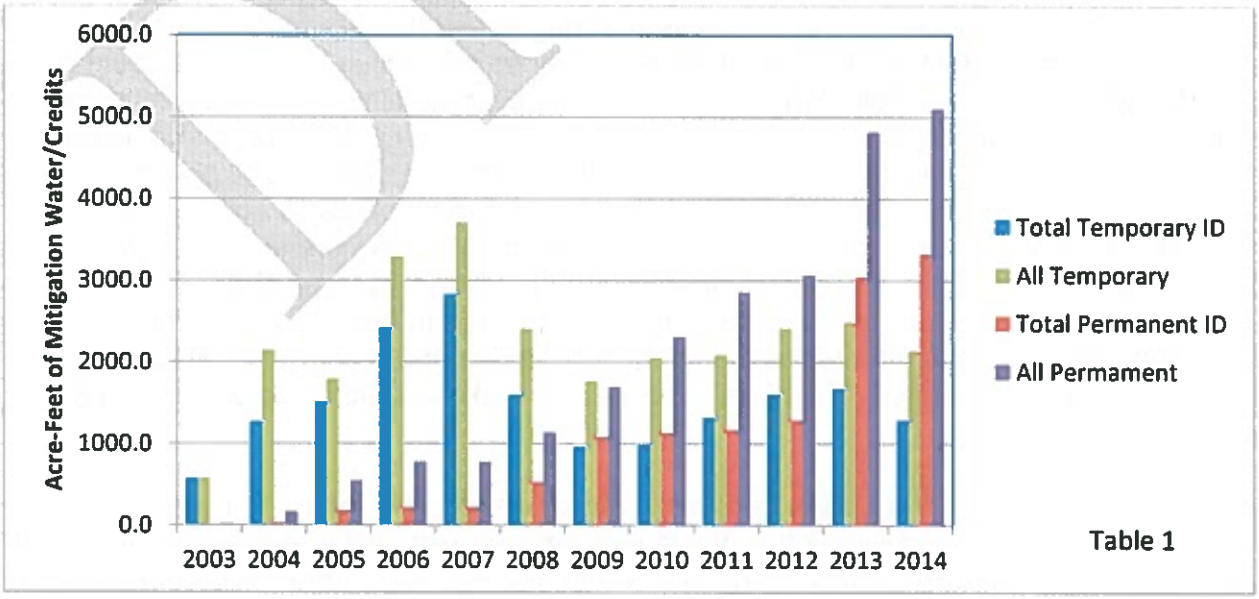


Table 1

Table 1 shows the amount of mitigation (in acre-feet) originating from Districts as compared to the total amount of mitigation generated for use in the DGWSA.

The Department understands that the Mitigation Program may have resulted in an increase in the market value of the District's water rights. As noted, in the comments from City of Bend, in the early years of the Mitigation Program, mitigation from the Districts was readily available. During that time period, Central Oregon was experiencing a booming economy and growth. Irrigated lands within several Districts were being urbanized. Some Districts developed policies for transferring or leasing water rights to instream use from lands that had been urbanized. Some of the water dedicated to instream use was used to establish both temporary and permanent mitigation. According to comments from Central Oregon Irrigation District, that District has filed permanent instream transfers for 2082 acres of irrigation use to be used for mitigation and/or instream flow restoration. However, demand for water to expand for new irrigation is growing within Central Oregon Irrigation District. As a result, the District has decreased the amount of irrigated acreage that may be changed to instream use. Table 2 shows the annual trend of irrigated acreage converted (temporary and permanent) to instream use for mitigation purposes from Districts as compared to the overall total acreage.

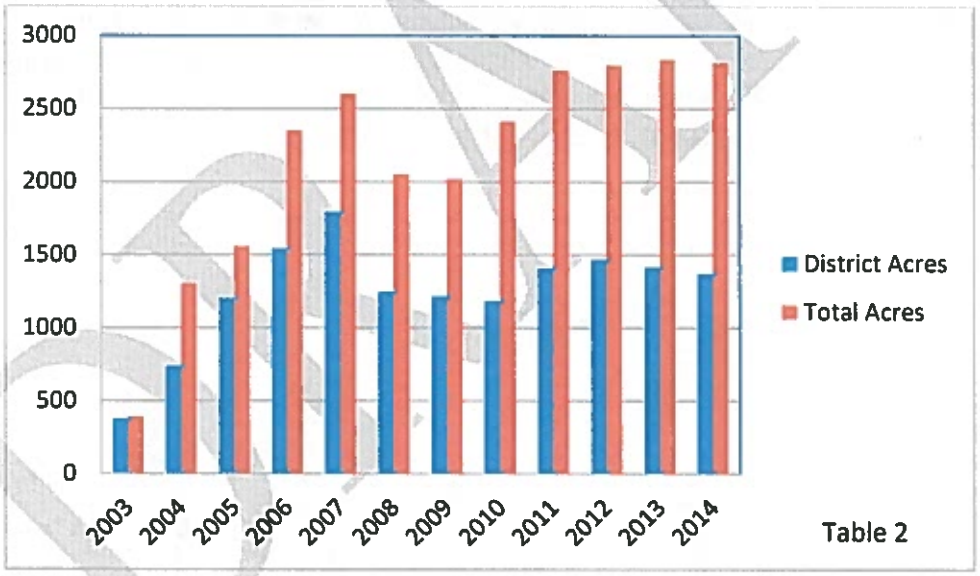


Table 2

In addition, Districts are facing additional and new challenges associated with the recent listing of the Oregon spotted frog under the Endangered Species Act. Central Oregon Irrigation District identified that they are working hard to meet species needs while continuing to meet the needs of their patrons and other basin needs.

Deschutes River Scenic Waterway and Instream Flows

In 1998, when the Department first initiated the Deschutes Steering Committee process, which ultimately led to the Deschutes Mitigation Rules, summer flows in the Deschutes River below Bend were often in the range of 30 cfs. These low flows occur during a

time period when water is being diverted out of the Deschutes River primarily by Irrigation Districts for irrigation use. In the years leading up to the Mitigation Program, the Irrigation Districts, which diverted water at or above the City of Bend, agreed to leave a minimum of 30 cfs in the Deschutes River (often referred to as the gentleman's agreement).

This picture of the Deschutes River, below Bend, was taken in 2002 with flows at approximately 40 cfs. The Mitigation Program rules were adopted by the Water Resource Commission in September, 2002.

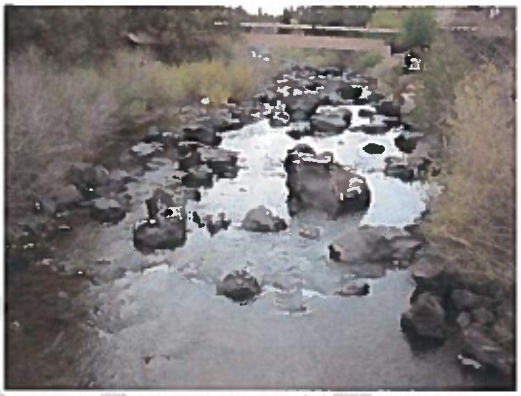


Photo 1

Most of the Deschutes River is a state designated Scenic Waterway. Under the Scenic Waterway Act (ORS 390.835), the highest and best uses of the waters of the Deschutes River are recreation, fish and wildlife uses.

Since the implementation of the Mitigation Program, the Program has helped add flows back into the Deschutes River and its tributaries. The primary source of mitigation has been the conversion of surface water irrigation rights to instream water rights, with the instream protection being within the irrigation season. The primary beneficial uses of these new instream water rights, in addition to mitigation, are recreation, fish and wildlife habitat, and pollution abatement.

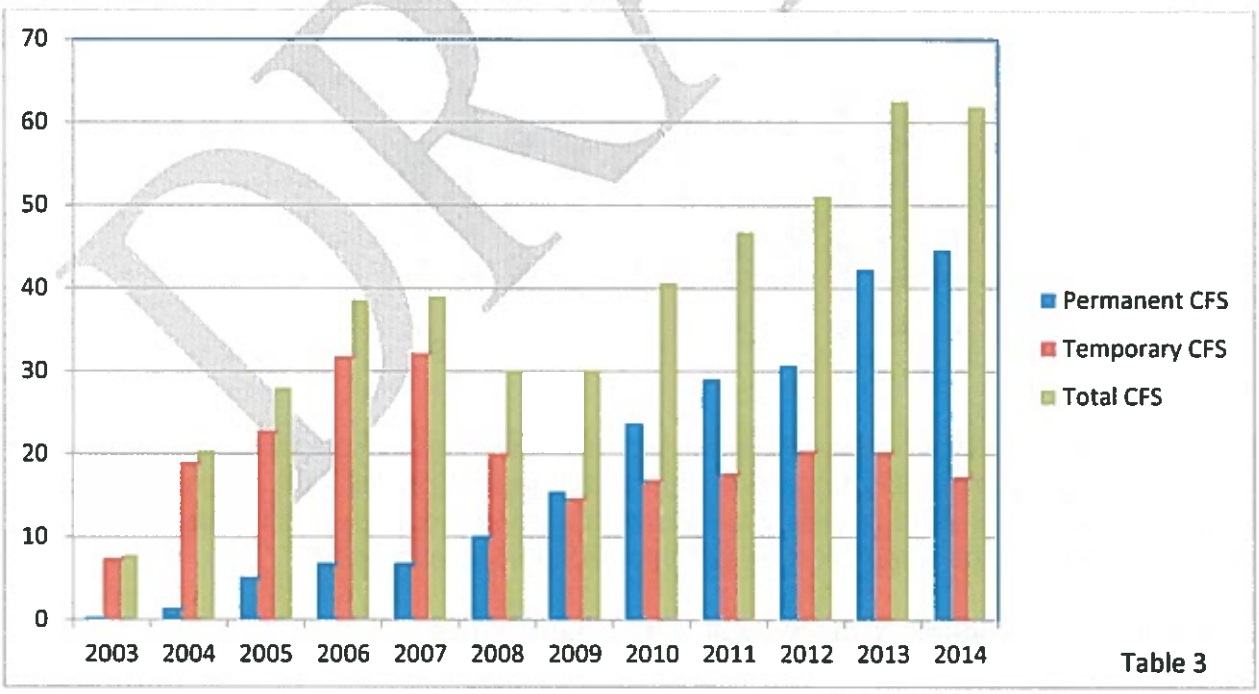


Table 3

Of the almost 62 cfs protected instream in 2014, in the Deschutes River and its tributaries, approximately 32 cfs of that originated from projects on the mainstem Deschutes River.

Photo 2

The Mitigation Program is not the only source of additional flows in the Deschutes River and its tributaries. There is a very active flow restoration program in the Deschutes Basin, led by the Deschutes River Conservancy (DRC). This picture of the Deschutes River, below Bend, was taken in 2009 with flows at approximately 240 cfs. A goal for flow restoration in this portion of the mainstem Deschutes River is to reach 250 cfs in protected instream flows, which is amount requested in a pending instream water right application filed by the Oregon Department of Fish and Wildlife. To date, through a combination of restoration and mitigation activities, approximately 110 cfs has been permanently converted to instream use in this section of the mainstem Deschutes River. In 2014, an additional 41 cfs was protected instream through temporary instream lease applications. According to the Deschutes River Conservancy, instream flow protection in the mainstem Deschutes River from both restoration and mitigation has recently averaged 125 to 135 cfs per year getting closer to the 250 cfs goal.

While restoration activities outside of the Deschutes Mitigation Program are not used to help achieve the goals of the Mitigation Program, additional flows in the Deschutes River, especially below Bend, have created opportunities for recreation where some activities were not previously possible during the summer months. Recreation activities such as kayaking and river floating are now possible. Recreational fishing has also improved.

Fish and Wildlife Habitat

The Deschutes River Basin above Pelton Round-Butte was once home to native runs of summer steelhead, Chinook Salmon, sockeye salmon, and Pacific lamprey. Efforts were made to provide fish passage and sustain the upper basin's salmon and summer steelhead runs when the hydroelectric project was constructed, but the efforts failed and were abandoned in 1969. However, interest in re-establishing anadromous fish runs in the upper Deschutes River sub-basin were initiated and has continued. The relicensing of Pelton Round-Butte in 2005, provided an opportunity to implement technical innovations in order to again attempt to re-establish anadromous fish runs. The Federal Energy Regulation Commission (FERC) license includes mandatory conditions from the U.S. Fish and Wildlife Service to implement a fish passage plan through Pelton Round-Butte.

In conjunction with these efforts, in 2008, Oregon Department of Fish and Wildlife and the Confederated Tribes of the Warm Springs Reservation published the

"Reintroduction and Conservation Plan for Anadromous Fish in the Upper Deschutes River Sub-basin, Oregon." This Reintroduction Plan is intended to contribute to a successful reintroduction effort by identifying key fish management issues and how they will be resolved. It discusses species and stocks to be reintroduced to areas above Pelton Round-Butte where these species had originally inhabited, and provides general guidance on methods, release locations, numbers, timing, and adjustments in hatchery supplementation as populations become re-established. One goal of reintroduction is to restore self-sustaining and harvestable populations of native summer steelhead, Chinook salmon, and sockeye salmon in areas where they had originally inhabited in the Deschutes River and its tributaries upstream from Pelton Round-Butte. Another goal is to reconnect native resident fish populations that are currently fragmented by Pelton Round-Butte.

Over the past decade many organizations and agencies have been working in the Deschutes River Basin to restore natural stream flows and to improve water quality and aquatic habitat in the river and its main tributaries. In addition, the DRC, the Upper Deschutes Watershed Council (UDWC), the Crooked River Watershed Council (CRWC), and the Deschutes Land Trust (DLT) have created a strategic alliance to implement projects in the Middle Deschutes River, Metolius River, Lower Crooked River, and Whychus Creek. These projects are focused to improve instream flows, water quality, and aquatic, riparian and upland habitat in these key sub-basins where anadromous fish are being reintroduced. These collaborative efforts will take many years to implement, but ultimately will lead to healthier ecosystems and anadromous fish populations in the Basin.

While streamflows have improved during the summer months, the Oregon Department of Fish and Wildlife (ODFW) has expressed concern about the Mitigation Programs impacts on fish and other aquatic organisms habitat during the portions of year outside of the summer months and irrigation season. ODFW identified that fish and other aquatic organisms are susceptible to events that de-water reaches or lower flow rates for extended periods. They have also identified that portions of the DGWSA are also home to the recently Endangered Species Act (ESA) listed Oregon Spotted Frog. Improvements to winter flows in the upper Deschutes, below Wickiup Reservoir, and on Crescent Creek, a tributary of the Little Deschutes River, are essential to the survival of the Oregon Spotted Frog. Instream flows provided under the Mitigation Program generally originate from seasonal uses, such as irrigation, and have instream periods between April 1 and October 31. ODFW expressed concern that new groundwater uses, as identified by the Department, ultimately have a uniform impact (reduction) on streamflows over the entire year and that mitigation water (instream flows) are only provided during a portion of the year.

The Oregon Department of Environmental Quality (DEQ) and WaterWatch expressed similar concerns with when mitigation water is protected instream and when impacts are occurring. DEQ has identified that many of the streams impacted by groundwater use are listed for flow-related water quality parameters during the non-irrigation season.

Central Oregon LandWatch also raised concern with regard to low flows in the Upper Deschutes River.

As identified in this section, the Mitigation Program is not the sole resource of restoration in the Deschutes Basin. There is a thriving flow and habitat restoration program. Restoration efforts utilize the Departments flow restoration programs, including allocation of conserved water, instream transfers and instream leases, with multiple instream leases submitted annually. The majority of water added to instream use from these projects is also during the irrigation season. But these may not be the only source of restoration or instream flow augmentation in the Basin. As noted, there are ongoing efforts to in the Deschutes Basin, specifically in the Upper Deschutes Basin above Lake Billy Chinook, to look at solutions to resolve imbalances in water supply and demand for both instream and out-of-stream needs in the Upper Deschutes Basin.

Potential Timing of Mitigation

As noted in the previous section, several stakeholders have expressed concerns related to the timing of mitigation and impacts of new groundwater use on surface water flows.

A basic fact of the Mitigation Program is that mitigation water/credits (instream transfers and leases) are generally targeted to enhance streamflow (offsetting new groundwater use) during the irrigation season when many stream reaches throughout the basin suffer from low flows and water quality issues that are detrimental to aquatic life. For example, streamflow for the Deschutes River below Bend has seen an increase in *median* summer streamflow from historic levels of 75 cfs to values of over 130 cfs in recent years, in part, in response to instream transfers and leases associated with the mitigation program. Furthermore historic *low* flows during the summer could be even lower than this median value, often dropping to 30 cfs during dry years. In fact, if not for a gentlemen's agreement between the local irrigation districts, the entire river could have been diverted at Bend during these years. Presently, summer streamflow below Bend is determined by instream water rights resulting from the mitigation program and conservation work by the DRC in partnership with the Irrigation Districts of Central Oregon. These instream rights have equal footing with respect to state water law, in contrast to the gentlemen's agreement. In summary, mitigation credits primarily increase streamflow during the summer.

In contrast, basic hydrogeology explains that the effects of mitigation debits will be spread over a longer time period than just the irrigation season. Debits are entirely in the form of new groundwater pumping (wells). The impacts of this additional groundwater pumping on streamflow are influenced by many hydrogeologic factors; but these impacts are generally muted in time and space compared to surface withdrawals. Given the hydrogeologic setting of the Deschutes basin, and also to simplify the mitigation program, additional groundwater pumping (mitigation debits) is assumed to produce a decrease in streamflow (within the determined zone of impact) that is uniformly distributed over the year. Thus mitigation debits have a different impact on

the change to streamflow in terms of timing than mitigation credits, even though on an annual basis the program balances the quantity of debits and credits. The end result is that the mitigation program increases streamflow during the irrigation season but, outside of the irrigation season, streams are not augmented by mitigation water and streamflow's decrease.

While groundwater use, as identified above, is assumed to have a year round impact on surface water flows, the actual timing of the impact may vary permit to permit. The effect of groundwater pumping on surface water flows is, in part, based on its proximity to surface water. If a well is located in close proximity to a surface water source (river, creek, lake), the impacts are likely more immediate and may be closer tied to the when the groundwater pumping is occurring, such as during the irrigation season. The further away from a surface water body a well is located, the longer it takes for its pumping impacts to be felt on surface water and the effect will be more attenuated, or spread out over the year. The actual effects of groundwater pumping on streamflow accumulate over a period of weeks or years depending on the location of pumping and other geologic and hydrogeologic factors.

There is a similar occurrence with mitigation projects (instream leases and instream transfers). Many of the water rights converted to instream use have associated return flows and transmission losses. Depending on the proximity of the original use to surface water and the length and type of the delivery system, return flows and water lost through the transmission system may have returned to the surface water system during the same use period or, for flows that seeped into the groundwater system, over a longer period of time. One of the primary sources of recharge to the regional aquifer has been irrigation return flows and canal losses (leakage) for projects located near Bend, Redmond, Madras, Prineville and Sisters (approximately 490 cfs). This is water that under natural (pre diversion) conditions would have been instream during the irrigation season (April through October). In general, the approval of a mitigation project then results in water protected and put back instream during the irrigation season. And, since, return flows and canal leakage are not legally protectable instream through an instream lease or instream transfer, this water is no longer diverted by the surface water user and left instream (even though unprotected) also during the originating period of use (irrigation season).

Identification of Zones of Impact

Groundwater users with permits issued under the mitigation program are required to provide mitigation within the DGWSA and in the appropriate zone of impact identified by the Department (Figure C). The Deschutes Mitigation Rules (OAR Chapter 690, Division 505) divide the required location of mitigation into two areas – (1) in a general zone of impact and (2) in a local zone of impact. Part of mitigating for a proposed groundwater appropriation necessitates determining where the mitigation must be provided in order to protect scenic waterway flows downstream of the proposed point(s) of appropriation, well locations.

Mitigation under the Deschutes Mitigation Program is water that may be legally protected instream and benefits the zone of impact in which a ground water permit applicant is required to provide mitigation.

General Zone of Impact

For mitigation in the General Zone of Impact (Figure B), the concept is that proposed wells in the general zone are developing water in the "regional aquifer" and their potential groundwater pumping impacts would be on the regional confluence areas of the Deschutes, Crooked and Metolius Rivers. Within this confluence area groundwater is discharging to surface water through a large spring system.

Groundwater applicants identified by OWRD as needing to provide mitigation in the General Zone are required to provide mitigation that benefits streamflows in the confluence area of the Deschutes, Metolius, and Crooked Rivers. Instream flows for mitigation must originate upstream from the Madras Gage, located approximately at River Mile 100.1 on the mainstem Deschutes River. The Madras Gage is located at the lower end of the spring system discharging into the mainstem Deschutes River. By providing mitigation upstream from this point, mitigation is targeted upstream from and into this spring area.

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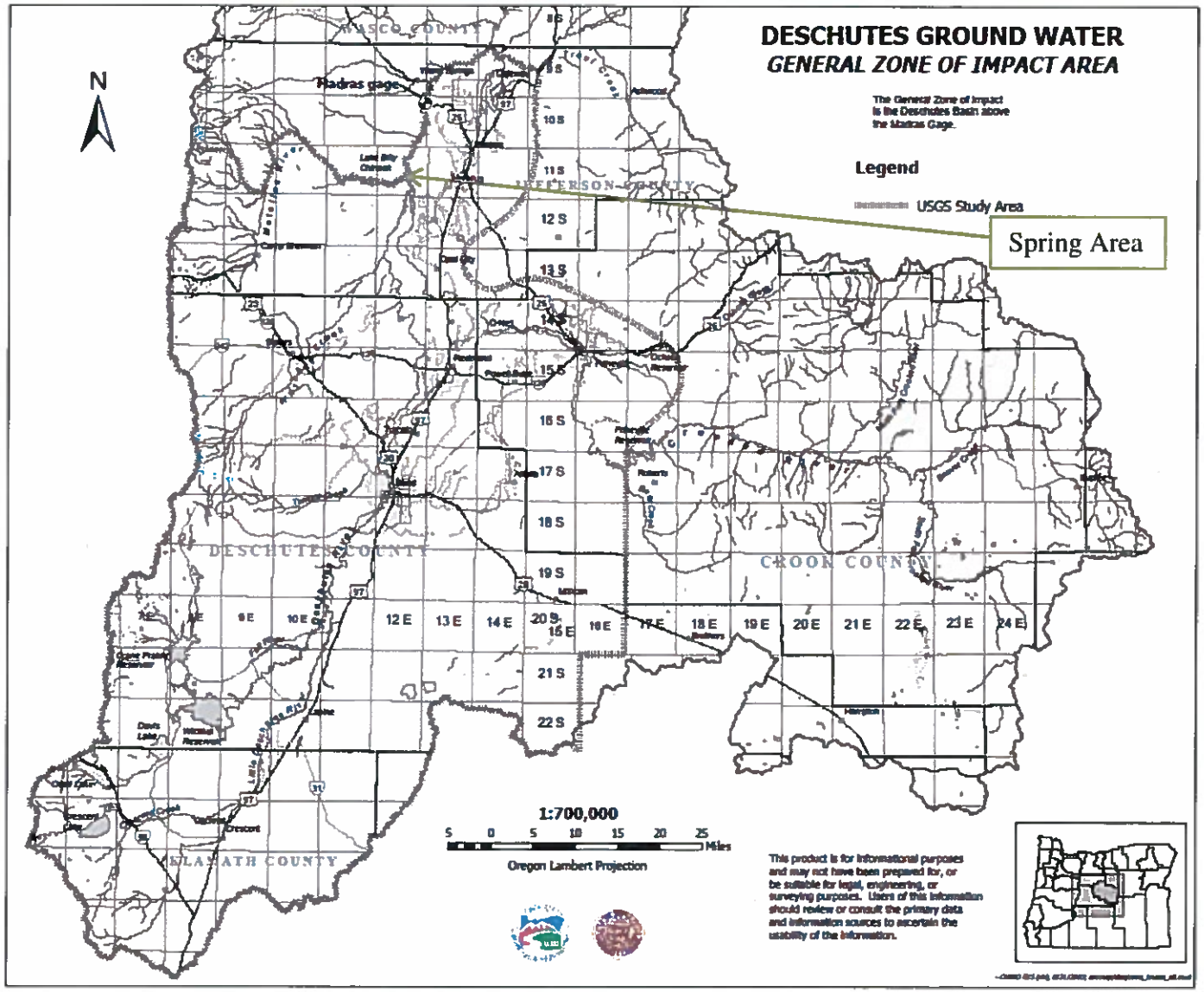

DESCHUTES GROUND WATER
GENERAL ZONE OF IMPACT AREA
The General Zone of Impact is the Deschutes Basin above the Madras Gage.
Legend
USGS Study Area
Spring Area
N
Madras gage
JEFFERSON COUNTY
WASCO COUNTY
DESCHUTES COUNTY
CROOK COUNTY
KLAMATH COUNTY
1:700,000
Oregon Lambert Projection
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Figure B

Local Zones of Impact

For proposed wells determined by the Department to have a localized impact on surface water, mitigation must be provided in a local zone of impact. The local zones of impact were identified and developed by the Department as part of implementation of the Mitigation Program beginning in 2002. The goal in developing the local zones of impact was to target mitigation in and above (upstream of) stream reaches, on a sub-basin level, where impacts on streamflows by groundwater pumping would occur and where instream flows were not being met. Instream flows considered in the development of the zones of impact were flows established by state scenic waterway designation, instream water right application filed by a state agency, including ODFW, and/or conversion of minimum perennial streamflows to instream water rights.

In development of the local zones of impact, consideration was given to:

- Locations where instream flows (instream water rights and/or scenic waterway flows) were not being met;
- Sub-basin boundaries as identified by surface water divides;
- General groundwater flow information; and
- Other hydrogeological information, including identification of where stream reaches were enhanced by groundwater discharge.

The lower boundary (the point above which mitigation would need to be provided) for each zone of impact was identified by either one of two means:

1. The lower boundary of the zone being below the lowest groundwater discharge area, or
2. The lower boundary of the zone being a point within a groundwater discharge area where instream flows are not met upstream from that point.

The local zones of impact identified by the Department included Whychus Creek, Crooked River, Little Deschutes River, and the Metolius River sub-basin areas. The local zones also included the stretches of the Deschutes River above River Mile 125 (referred to as the Middle Deschutes) and above River Mile 185 (referred to as the Upper Deschutes).

The local zones of impact are shown on the following map (Figure C). The red line on the map is the boundary of the DGWSA (USGS Study Area) and the shaded and hachured areas are the zones of impact.

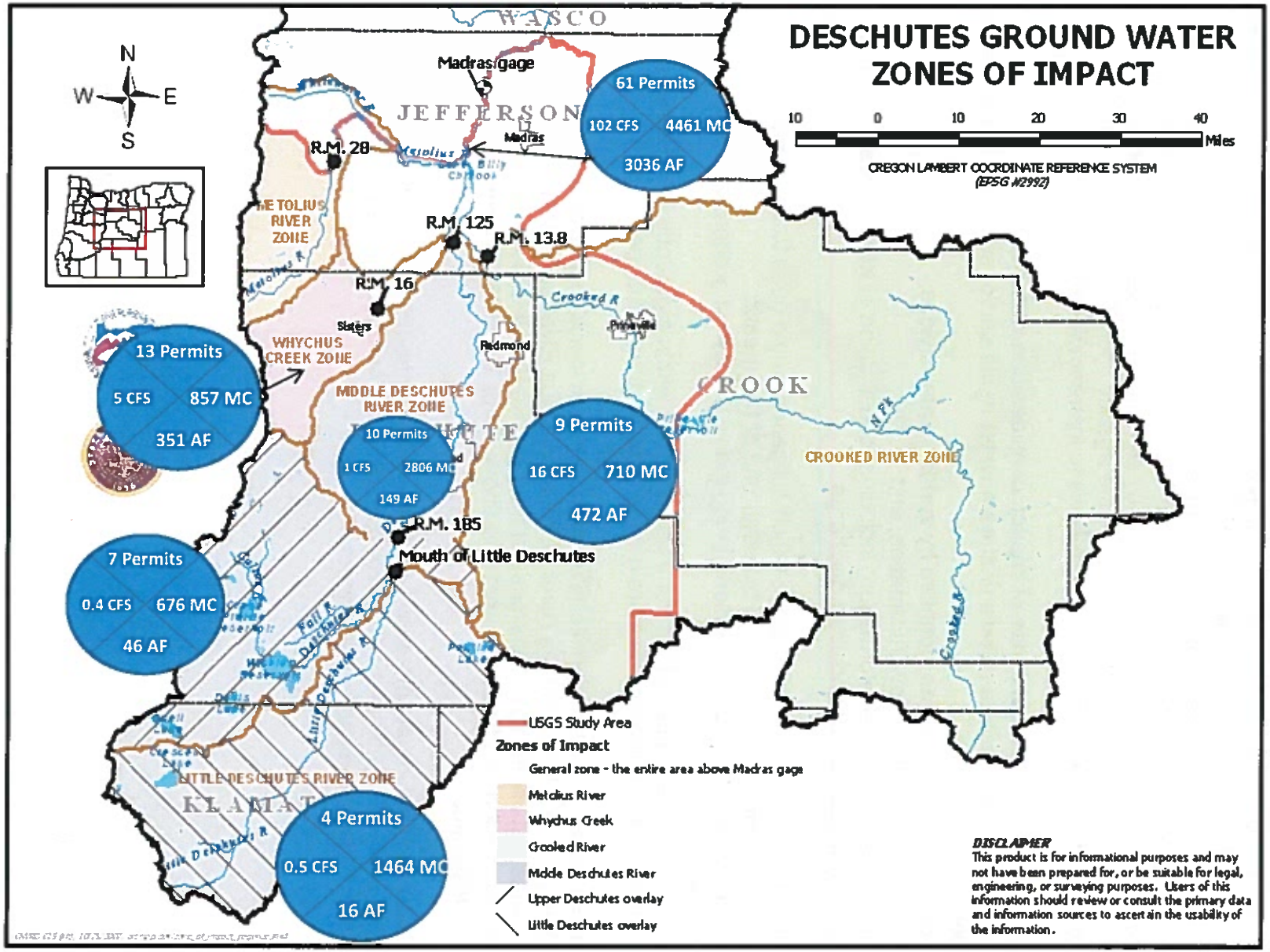

DESCHUTES GROUND WATER
ZONES OF IMPACT
N
W
E
S
WASCO
JEFFERSON
CROOK
KLAMATH
Madras gage
Madras
R.M. 28
R.M. 125
R.M. 13.8
R.M. 16
R.M. 185
Mouth of Little Deschutes
Sisters
Redmond
Prineville
Crooked R
61 Permits
102 CFS
4461 MC
3036 AF
13 Permits
5 CFS
857 MC
351 AF
10 Permits
1 CFS
2806 MC
149 AF
9 Permits
16 CFS
710 MC
472 AF
7 Permits
0.4 CFS
676 MC
46 AF
4 Permits
0.5 CFS
1464 MC
16 AF
METOLIUS RIVER ZONE
WHYCHUS CREEK ZONE
MIDDLE DESCHUTES RIVER ZONE
CROOKED RIVER ZONE
LITTLE DESCHUTES RIVER ZONE
10 0 10 20 30 40
Miles
OREGON LAMBERT COORDINATE REFERENCE SYSTEM
(EPSG #2992)
USGS Study Area
Zones of Impact
General zone - the entire area above Madras gage
Metolius River
Whychus Creek
Crooked River
Middle Deschutes River
Upper Deschutes overlay
Little Deschutes overlay
DISCLAIMER
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Figure C

As noted earlier in this report, Figure C also shows the distribution of permits, amount of water use authorized in cfs, current consumptive use levels in acre-feet (AF), and mitigation credits (MC) by zone of impact for 2014.

Middle Deschutes: The Middle Deschutes Zone of Impact encompasses the area of the Deschutes River and tributaries above River Mile 125. From approximately River Mile 138 downstream to Lake Billy Chinook, at approximately River Mile 120, the Deschutes River is influenced by groundwater discharge to surface water. This section of the Deschutes River can gain as much as 305 cfs. Instream flows in this section of the Deschutes River are established by Scenic Waterway designation and an instream water right application (IS-70695) filed by the Oregon Department of Fish and Wildlife (ODFW). Scenic waterway instream flows range from 250 cfs to 500 cfs. Proposed instream flows associated with instream water right application IS-70695 are 250 cfs. Streamflows, including instream flows, are vulnerable to interference by groundwater use.

However, downstream from River Mile 125, instream flows (Scenic waterway and instream water right application) are generally met. Instream flows are generally not met between River Mile 125 and River Mile 138. River mile 125 was selected as the lower boundary of this zone to target mitigation into this stretch of the Deschutes River.

By using River Mile 125 as the lower boundary of the Middle Deschutes Zone of Impact, mitigation projects are required to establish instream flows within a reach of the Deschutes River that is vulnerable to groundwater interference and where proposed instream flows are not satisfied. Mitigation projects (instream transfers and instream leases) developed in the Middle Deschutes Zone have resulted in instream flows that are protected in the Deschutes River in reaches that extend through River Mile 125 and downstream to Lake Billy Chinook (at approximately River Mile 120).

Groundwater permit applications found to have an impact on surface water flows in this zone must provide mitigation that benefit instream flows within the Deschutes River and with instream reaches beginning upstream of River Mile 125.

Whychus Creek: The Whychus Creek Zone of Impact encompasses the area of the Whychus Creek sub-basin above River Mile 16 on Whychus Creek. River Mile 16 is located below a set of springs (the lowest groundwater discharge area on Whychus Creek) on the east side of McKinney Butte and is located below where the groundwater level is no longer coincident with Whychus Creek.

Instream flows in this section of Whychus Creek were established under an instream water right application (IS-70753) filed by ODFW and authorized under Instream Certificate 73223. Instream flows range from 33 cfs to 50 cfs.

Instream flows upstream and downstream from River Mile 16 are not met. However, groundwater use does not interfere with surface water flows in Whychus Creek between River Mile 16 and a downstream groundwater discharge area, Alder Springs, at the mouth of Whychus Creek. Groundwater use can impact flows in the groundwater

discharge area at Alder Springs but flows in Whychus Creek in that area are sufficient to meet instream needs.

By using River Mile 16 as the lower boundary of the Whychus Creek Zone of Impact, new instream flows established by a mitigation project may be targeted to begin in and/or upstream of a section of Whychus Creek that is vulnerable to groundwater interference and where instream flow requirements are not being met. Generally, all mitigation projects (instream leases and instream transfers) that have been used to establish mitigation in the Whychus Creek Zone of Impact result in instream flows that begin upstream from River Mile 16 and, at a minimum extend to the mouth of Whychus Creek, which includes the Alder Springs area.

Groundwater permit applications found to have an impact on surface water flows in this zone must provide mitigation that benefits instream flows in Whychus Creek beginning upstream from River Mile 16.

Crooked River: The Crooked River Zone of Impact encompasses the Crooked River sub-basin above River Mile 13.8 (at Osborne Canyon) on the Crooked River. The Crooked River from approximately River Mile 21 to the mouth is influenced by groundwater discharge to surface water flows. In the stretch of the river between River Mile 6.7 (Opal Springs) and River Mile 13.8 (Osborne Canyon), the river can gain as much as 1000 cfs. There is a proposed instream water right on the Lower Crooked River from Bowman Dam at River Mile 71 to the Crooked River arm of Lake Billy Chinook at River Mile 6. The proposed instream flows under this application (IS-70354) filed by ODFW range from 75 cfs to 255 cfs. These proposed instream flows are generally not met upstream of River Mile 13.8 and are generally met downstream of River Mile 13.8.

By using River Mile 13.8 as the lower boundary of the Crooked River Zone of Impact, mitigation projects are required to establish instream flows within a reach of the Crooked River that is vulnerable to groundwater interference and where proposed instream flows are not satisfied. Mitigation projects (instream transfers and instream leases) developed in the Crooked River Zone have resulted in instream flows that are protected in the Crooked River in reaches that extend through River Mile 13.8 and downstream into the Crooked River arm of Lake Billy Chinook (at approximately River Mile 6).

Groundwater permit applicants found to have an impact on surface water flows in the Crooked River must provide mitigation that benefits instream flows in the Crooked River with instream reaches beginning upstream of River Mile 13.8.

In comments to the Department, the Bureau of Land Management suggested that federal Wild and Scenic River instream flows (federal reserved right) should be considered, specifically those on the lower Crooked River. However, flows associated with federal wild and scenic river designations are not flows that may be regulated by the Oregon Water Resources Department unless a state water right is obtained. While,

in this example, the Crooked River is not a state scenic waterway, flows within the Crooked River are protected under state instream water rights.

Little Deschutes River: The Little Deschutes River Zone of Impact encompasses the Little Deschutes River sub-basin above the mouth of the Little Deschutes River. The maintstem of the Little Deschutes River and several of its tributaries in the upper reaches are vulnerable to interference by groundwater use. The groundwater discharge reach on the Little Deschutes River extends from the confluence with Crescent Creek (at approximately River Mile 54) downstream to the mouth of the Little Deschutes River.

In this section of the Little Deschutes River, instream flows are established by an instream water right application (IS-70757) filed by ODFW and authorized under Instream Certificate 73226. Instream flows under Certificate 73226 range from 74.5 cfs to 240 cfs. These instream flows are not met in the Little Deschutes River within the groundwater discharge area extending down to the mouth of the Little Deschutes River.

By using the mouth of the Little Deschutes River as the lower boundary of the Little Deschutes Zone of Impact, mitigation projects are required to establish instream flows within and/or above a reach of the Little Deschutes River that is vulnerable to groundwater interference and where instream flows are not being met. Mitigation projects (instream transfers and instream leases) developed in the Little Deschutes Zone have resulted in instream flows that begin within or upstream of the groundwater discharge area on the Little Deschutes River and extend at least to the mouth of the Little Deschutes River.

Groundwater permit applicants found to impact surface water flows in this zone, must provide mitigation that benefits instream flows in the Little Deschutes River beginning upstream from the mouth of the river.

Upper Deschutes: The Upper Deschutes Zone of Impact encompasses the Deschutes River sub-basin above River Mile 185. River Mile 185 is located on the mainstem Deschutes River a few miles downstream from its confluence with Spring River. Flows in a significant portion of the Deschutes River above River Mile 185 are influenced by groundwater discharge and vulnerable to interference by new groundwater use. The lower most point in the groundwater discharge area on the Deschutes River is River Mile 185. This discharge area does not appear to continue downstream from River Mile 185.

Instream flows in this section of the Deschutes River upstream from River Mile 185 are established by scenic waterway designation and conversions of minimum perennial stream flows to instream use. Scenic waterway instream flows range from 400 cfs to 500 cfs. Instream flows based minimum perennial stream flows range from 300 cfs (upstream from the confluence with the Little Deschutes River) to 400 cfs (downstream, between the confluence with the Little Deschutes River and the confluence with Spring River). These instream flows are not met in the Deschutes River upstream of River Mile 185. Nor are they met downstream from this point. However, as identified, the

Deschutes River downstream from River Mile 185 is not influenced by groundwater discharge. Groundwater use does not appear to affect flows in the Deschutes River downstream from River Mile 185 until the area of groundwater discharge in the Middle Deschutes Zone of Impact.

By using River Mile 185 as the lower boundary of the Upper Deschutes Zone of Impact, new instream flows established under a mitigation project may be targeted into a reach of the Deschutes River that is both vulnerable to groundwater use and where instream flows are not being met .

Groundwater permit applicants found to impact surface water flows in this section of the Deschutes River, must provide mitigation that benefits flows with instream reaches beginning upstream from River Mile 185.

No mitigation projects have been developed to date that originate in the Upper Deschutes Zone of Impact. Mitigation projects for this zone have originated in the Little Deschutes Zone of Impact. The mouth of the Little Deschutes is located a few miles upstream from River Mile 185 on the mainstem Deschutes River. Mitigation projects (instream leases and instream transfers) with instream flows protected in instream reaches that extend past the mouth of the Little Deschutes and into the mainstem Deschutes River protect instream flows into the groundwater discharge area on the mainstem Deschutes in the Upper Deschutes Zone of Impact, downstream past River Mile 185 and down to Lake Billy Chinook at approximately River Mile 120.

Metolius River: The Metolius River Zone of Impact encompasses the Metolius River sub-basin upstream from River Mile 28 on the Metolius River. River Mile 28 is located at the confluence between the Metolius River and Jefferson Creek. This is the lowest point in the Metolius River sub-basin where groundwater discharges to surface water flows. Upstream from River Mile 28, stream flows in the Metolius River and many of its tributaries are influenced by groundwater discharge and are vulnerable to interference by groundwater use. Downstream from River Mile 28, streamflows do not appear to be vulnerable to interference by groundwater use.

The Metolius River is a designated State Scenic Waterway with instream flows ranging from 250 cfs to 350 cfs. The Metolius River and several of its tributaries also have instream water rights. Instream flows, including scenic waterway flows, are met in the Metolius River sub-basin.

Groundwater permit applicants needing to provide mitigation within this zone would be required to provide mitigation that originates upstream from River Mile 28 to target mitigation into the reach of the Metolius River that is effected by groundwater use, the groundwater discharge area.

To date, no mitigation projects have been established in this zone of impact. There are also no groundwater permits approved under the Mitigation Program yet in this zone. There are four pending groundwater permit applications and two pending mitigation

projects proposed for this zone of impact. The Department anticipates reviewing the proposed mitigation projects within the next calendar year.

Zone of Impact Identification for Groundwater Permit Applications

The Department identifies a single zone of impact for each groundwater permit application. This is based upon the understanding that the intent under the rules was to have 100% of the mitigation in the general (regional) zone of impact or 100% in a localized zone of impact.

Conceptual Approach: When the Department was initially implementing the Mitigation Program, considerable thought was given to how to balance using the best information available without making the review process overly complex. The Department chose to use a conceptual approach rather than using the regional, Deschutes groundwater flow model to make the zone of impact finding. Using the conceptual approach, the Department reviews a proposed well based upon its proximity to groundwater discharge areas, its construction, which part of the aquifer it will draw water from, hydraulic head[1], and general groundwater flow direction to determine whether the proposed use will have a localized impact to surface water. If the well will have a localized impact on surface water, the Department finds that 100% of the mitigation must occur in the local zone off impact. Put another way, if the Department determines that a proposed well will have a localized impact, the Department does not further analyze the point of appropriation to determine whether the proposed appropriation will also affect the aquifer in the general zone of impact. This approach, while non-quantitative, allows for the use of locally applicable data and sound hydrologic principles.

This methodology has been used since the implementation of the Mitigation Program.

Modeled Approach: The Department could have taken the approach of using the regional groundwater flow model to computationally evaluate the impact on each surface water body caused by groundwater development, but it chose not to because the Deschutes groundwater flow model is not consistent across the extent of the basin for evaluating individual well impacts to surface water. The current model does not accurately simulate some areas in the DGWSA where we observed groundwater discharge (springs).

In general, when a well is drilled in a particular area the effects of groundwater pumping spreads in all directions from the well, both up gradient and down gradient and can impact multiple streams. When a well is pumped, the altitude of the water table (the hydraulic head) is lowered in the vicinity of the well forming a cone of depression (see Figure D). The effect spreads out radially in all directions from the well, with the magnitude and geometry varying according to the local geology, flow directions and boundaries of the groundwater system. The cone of depression stabilizes when sufficient groundwater flow is intercepted to supply the pumping. Once the cone of

[1] *Hydraulic head* is the measure of water pressure above a point in the aquifer and is commonly described as a water-level elevation above mean sea level.

depression stabilizes, the discharge of groundwater from the well must be offset by diminished discharge of groundwater to springs, streams, and wetlands elsewhere, or by increased flow to the aquifer system from other boundaries.

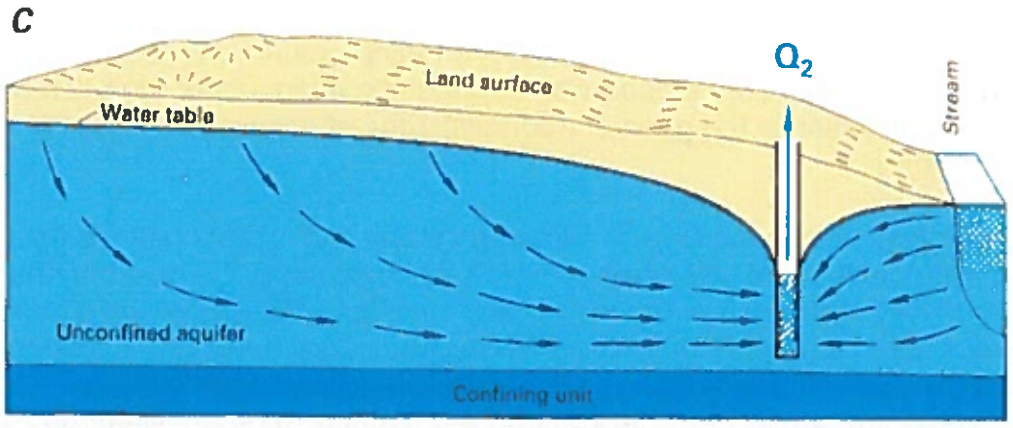


Figure D

While the model could be used to identify impacts on multiple stream sources, to quantify the impact on each surface water body by each individual well using the Deschutes groundwater flow model would be a substantial undertaking and would require a mathematical model that accurately simulates the interaction between surface water and groundwater over the entire basin. Currently, as noted, the model is not accurate across the entire basin.

In comments to the Department, it's been suggested that the Department has previously used a quantitative (numerical) or modeled analysis to review groundwater applications to make a determination that the zone of impact is that zone in which the majority of the impact will occur, and that the Department refers to the zone where mitigation must occur as the "primary zone of impact."

This assertion is the subject of pending litigation and the Department disagrees with commenters on the point of what it meant when it referred to the "primary zone of impact" in a 2007 letter to the Governor. It is the Department's position that the letter that it wrote to the Governor in 2007 is not an official agency position regarding how it determines the zone of impact when processing water right applications in the DGWA. Instead, the 2007 letter responded to the Governor's request that the Department look at whether existing laws were adequate to assure that a new destination resort in the Metolius sub-basin would result in no reduction in stream flows in the Metolius River. In response to the Governor's question, the Department wrote a letter explaining that ground water development could result in impacts to streams beyond the sub-basin in which the development occurred. However, the Department explained, mitigation would only be required in the primary zone of impact – being the zone of impact that is determined using the conceptual approach described above. In using the term "primary zone of impact" the Department was seeking only to emphasize that the protections the

Governor sought would only occur in one local zone of impact even if the impacts of development could affect more than just the local zone of impact.

Despite assertions by commenters, the Department does not quantify and compare impacts to one zone or another in its zone of impact determination when it assesses new groundwater applications in the study area, and does not use the Deschutes groundwater flow model when it assesses applications. Instead, the Department relies on the conceptual approach initially described in this section and has consistently used this approach since implementation of the Mitigation Program.

Single Zone of Impact: Using the conceptual approach, as described above, the Department identifies a single zone of impact for each groundwater permit application.

In comments to the Department, stakeholders raised concern with the single zone of impact identification and impacts to streams outside of that zone of impact or upstream from the mitigation location. The goal of identifying a local zone of impact is to target mitigation in and upstream of areas impacted by groundwater use. When water is pumped from a well, the impact of the pumping will spread out in all directions from the well, both up gradient and down gradient. Mitigation for each local zone of impact is targeted to be either:

1. Upstream from the bottom of the lowest groundwater discharge area in the zone, or
2. Upstream from the point where instream requirements are not met within the lowest groundwater discharge area.

The Department is then able to require mitigation that originates upstream of affected areas that are vulnerable to impacts by groundwater use and where additional stream flows are needed.

Based upon feedback from stakeholders, the Department recognizes that stakeholders remain concerned about how the zone of impact is determined. Once litigation has concluded, the Department may evaluate the zones of impact and provide any necessary updates and identification of program improvements in the next legislative report due in 2021.

Zone of Impact Identification for Mitigation Projects

Mitigation for groundwater permit applications is provided by mitigation projects. A mitigation project is a completed project that results in mitigation water. Mitigation is water that can be legally protected instream. One acre-foot of mitigation water is equal to one mitigation credit.

Groundwater permit applicants may either complete their own mitigation project or obtain mitigation credits from an individual or entity, known as a mitigation credit holder, who has already completed a mitigation project. The mitigation water/credits must be

located in the same zone of impact as that impacted by the groundwater permit application. When the Department evaluates a mitigation project, it will identify the zone of impact in which any mitigation water generated by the project may be used.

To date, only two types of mitigation projects have been used to establish mitigation water; permanent instream transfers and instream leases, which are temporary in nature. Both types of projects result in a quantity of water that can be legally protected instream with an instream period and instream reach.

Mitigation projects establish mitigation water within at least one zone of impact and may establish mitigation in more than one zone. For mitigation projects that establish mitigation in more than one zone of impact, the instream reach extends through more than one zone of impact. For example, a mitigation project that results in protected flows with an instream reach beginning in the Little Deschutes River and extending into the mainstem Deschutes River downstream to Lake Billy Chinook, would protect flows in the Little Deschutes Zone, the Upper Deschutes Zone, the Middle Deschutes Zone and into the General Zone of Impact.

When determining the appropriate zone of impact for use of mitigation water from a mitigation project, the Department considers:

- The reach in which or point at which water may be protected instream;
- Whether the project would provide a benefit to streamflows within the DGWSA and into the zone or zones of impact. For example, a project to establish mitigation in the Crooked River Zone of Impact that is located above Prineville Reservoir, on the Crooked River, outside of the DGWSA would have to demonstrate how water could be protected through the reservoir and down into the reach on the Crooked River affected by ground water use.

WaterWatch, in comments on a draft version of this report, raised the question of why water protected instream under a mitigation project was not protected through the lower reach of the Deschutes River (below Lake Billy Chinook/Pelton-Round Butte) to the mouth of the Deschutes River. They identified that unless mitigation is carried down through the entire system, then instream water rights and/or scenic waterway flows will be injured or diminished by further consumptive use of groundwater.

Mitigation Projects are reviewed by the Department under the Mitigation Program Rules (Division 505 and Division 521) and they must also be reviewed under their originating process rules, currently being OAR Chapter 690, Division 77 for establishment of Instream Water Rights. By rule, an instream water right (established by instream transfer, instream lease, and allocation of conserved water) may be protected within a reach from a point on the source stream (generally, the original point of diversion) to the mouth of the source stream. Water may be protected past the mouth of the source stream only if the quantity to be protected instream is a measurable portion of the receiving stream (OAR 690-077-0015(8)).

Many mitigation projects originating on tributaries to the Deschutes River are not measurable portions of the receiving stream, primarily the Deschutes River, and are only protected to the mouth of their source stream. As instream quantities have increased (combination of restoration and mitigation flows), newer mitigation projects may be protected past the mouth of the source stream. For example, additional instream water rights established on Whychus Creek are now measurable and protectable into the mainstem Deschutes River. However, projects originating in the Crooked River are not yet measurable into the mainstem Deschutes River.

Instream uses from Mitigation Projects that are protected instream in the mainstem Deschutes River generally terminate at Lake Billy Chinook. In the Lake Billy Chinook area there is a large spring complex, which is an area of groundwater discharge to surface water flows. A portion of surface water diverted for out of stream uses upstream from Lake Billy Chinook seeps into the groundwater system and returns to the surface water system as subsurface return flows.

Under Division 77, the Department is required to consider return flows as part of the establishment of the instream use to prevent injury to other water rights. If return flows are identified, the Department is required to account for those return flows at an instream point downstream from the original diversion point or at the point of diversion itself, if the return flows don't occur at a definite point. OAR 690-077-0075(2)(b)(B) and (2)(c)(A)

In general, sub surface return flows from uses occurring upstream from Lake Billy Chinook return to the Deschutes River at or above the Madras Gage and become surface water flows that are then available to downstream water rights. The Madras Gage is located at approximately River Mile 100.1 and at the bottom of the groundwater discharge area (spring system). The amount of water that may be protected instream downstream from the Madras Gage is generally the consumptive portion of the originating use. It is this consumptive portion that is also being used as mitigation of groundwater uses under the Mitigation Program. To date, mitigation has been the conversion of an existing consumptive surface water use to instream use in favor of a new consumptive groundwater use.

Given that instream flows in the Lower Deschutes River would be limited to the consumptive portion of the originating water use/right and that water is being used as mitigation, there would be no added benefit to instream flows in the lower Deschutes River.

Review of Impacts on the Headwaters of the Metolius River and Other Key Reaches of the Metolius River System

The Department has been actively engaged in programs to measure and evaluate impacts to the Metolius River. Instrumentation and monitoring stream flow and groundwater levels are paramount to understanding variations in the natural system. Complex interactions between groundwater pumping and impacts on surface water

resources are best understood using numerical techniques that also account for natural climate variability.

In October, 2007, Department staff re-established a stream gaging station just downstream of Camp Sherman near the Allingham campground to generate a continuous stream flow record. In addition, staff have conducted seepage measurements and identified key reaches of groundwater inflow to the main-stem Metolius River. The Department is also conducting quarterly stream flow measurements near the headwater springs to assess stream-flow variations over time in that area.

Currently, Department staff continues to monitor groundwater levels at a well near Allingham, and is working with landowners to secure permission to install and instrument dedicated observation wells to assess long-term groundwater level changes in the Metolius area. Also, staff is working with the U.S. Geological Survey (USGS) in a cooperative study to update and improve the Deschutes groundwater flow model. By incorporating a more detailed stream network into the model and reducing the model cell size in the Metolius river area, the USGS and Department will improve the capability to simulate groundwater impacts to the headwaters of the Metolius River and other key reaches.

Stakeholders also raised concern with regard to other spring systems in the DGWSA. ODFW identified that springs are a source of cold water input and that the source of mitigation water is primarily warmer water from storage. Continued pumping from groundwater may impact springs where there is a connection between groundwater and surface water. They suggest that OWRD implement a program to monitor key spring complexes to determine ecological impacts to springs resulting from groundwater pumping. Central Oregon Land Watch raised similar concerns with groundwater use and the mitigation program. They added that the springs of the Metolius River, Whychus Creek and Lower/Middle Deschutes River, all located within the DGWSA, are critical for recreation and scenic attraction and there has been a significant investment in reintroduction of anadromous fish species. The Department recognizes that additional work and discussion with stakeholders may be necessary to further evaluate the issues raised. The Department is also currently working with U.S. Geological Survey to update the Deschutes groundwater flow model. It's possible that the updated model (when available) may help us better understand impacts to springs. An update on how the model can be or has been used will be provided to the Legislature in the next report due in 2021.

Potential Timing of Federal, State and Local Storage Improvements

There are several existing storage projects in the Deschutes Basin. As of the writing of this report, there have been no new federal, state, or local storage developments. However, the United States (U.S.) Congress recently passed legislation to change how water stored in the existing Prineville Reservoir may be allocated. Prineville Reservoir is authorized under Water Right Certificate 57612 to store up to 155,000 Acre-Feet (AF)

for irrigation purposes from the Crooked River, a tributary of the Deschutes River. This reservoir is owned and operated by the U.S. Department of Interior, Bureau of Reclamation. In December of 2014, the U.S. Congress passed the Crooked River Collaborative Water Security and Jobs Act of 2014, which became public law on December 18, 2014. Under this Act, up to 5100 AF of water stored in Prineville Reservoir may be used to establish mitigation for groundwater use by the City of Prineville consistent with Oregon Law. The Act also identified that a portion of the water stored in Prineville Reservoir may be used for instream flow enhancement. The next steps will include the Oregon Water Resource Department working with the Bureau of Reclamation and City of Prineville to change how water stored in Prineville Reservoir may be appropriated under state law.

Other Issues Identified by Stakeholders

To develop this report, the Department solicited input and feedback on the Deschutes Groundwater Mitigation Program from stakeholders. Stakeholders were provided several opportunities to convey feedback to the Department on issues associated with the Mitigation Program. This section contains an identification and discussion of the additional issues identified by stakeholders.

General Issues:

A few stakeholders identified that there were a number of outstanding issues identified in the previous legislative report (Deschutes Ground Water Mitigation Program: House Bill 3494 Report, dated January 2009, located on the Department's web page at http://www.oregon.gov/owrd/docs/deschutes_2009_hb_3494_report.pdf) by the Deschutes Work Group that still need to be resolved. As identified in feedback to the Department, there are active efforts and studies in the Deschutes Basin that may create opportunities to address some of these outstanding concerns.

To assist with the development of the 2009 Legislative report, the Department convened the Deschutes Work Group. Members of the work group represented a broad range of water users and organizations with an interest in water use in the Deschutes Basin. This group was convened to review the implementation and operation of the Deschutes Mitigation Program. The Group identified where the program was being successfully implemented and where members of the group believed the program could be modified or improved.

The Primary issues that were raised in the 2009 House Bill 3494 (Chapter 669, Oregon Laws 2005) legislative report included:

- How zones of impact are determined by the Department;

  The Deschutes Work Group discussed the zone of impact determination and identified potential issues with the zone of impact determination, the location of

mitigation within the zone of impact (being at or above the point of impact), and the identification of a single or "primary" zone of impact.

Issue statement from House Bill 3494 Report: Some stakeholders are concerned about the Department requiring mitigation only in the "primary" zone of impact when groundwater pumping may impact more than one zone of impact.

Recommendation from House Bill 3494 Report: Recommend that the Department improve its analytical tools to be better able to assess the zones of impact.

This issue is discussed in the Identification of Zones of Impact section of this report.

- How water is counted under the 200 cfs allocation cap;

  Issue statement from House Bill 3494 Report: A requirement to count all final orders issued under the mitigation rules (even zero mitigation obligation, non-consumptive, and offset) appears to be an unintended consequence of the current rules. The issue is whether zero mitigation obligation or non-consumptive uses, such as a closed loop heat exchange, or permits issued under an offset, should be counted under the 200 cfs cap.

  Recommendation from House Bill 3494 Report: Water allocated under the 200 cfs cap should be restored to the cap if the amount of water use authorized in the permit or final certificates is less than the amount originally approved in the final order.

  In 2010, the Water Resources Commission adopted OAR Chapter 690, Division 522, to clarify how water can be added back to the allocation cap, including when the permit and certificate are issued for less water. The new rules incorporated the recommendation from the Deschutes Work Group and included additional provisions under which water could be added back to the allocation cap, including cancellation and amendment or withdraw of an application after a final order was issued.

  Following adoption of the Division 522 rules, the Department identified an unintended limitation in the rules. The rules, adopted in 2010, cite specific cancellation statutes that did not include all provisions for cancellation. The Water Resources Commission, on June 19, 2015, adopted changes to Division 522 allowing water to be added back to the allocation cap regardless of how a permit or certificate were cancelled.

- Use of offsets in incremental development plans by municipal and quasi-municipal permit holders;

  Issue Statement from House Bill 3494 Report: The mitigation rules allow municipal or quasi-municipal permit holders to meet a mitigation obligation by incrementally obtaining and providing mitigation using a combination of current and future instream leases, permanent instream transfers, and the purchase of mitigation credits to satisfy the required mitigation over time. However, as currently written, the incremental mitigation rules do not cross-reference the offset provision, and therefore the rules currently do not allow for the use of "offset" as part of an incremental mitigation plan.

  Recommendation from House Bill 3494 Report: The rules should be modified so that the use of an offset, as defined under the current rules, should not be counted under the cap.

  Recommendation from House Bill 3494 Report: Recommend that the Mitigation Rules be modified so that offsets, as defined under the current rules, can be used in an incremental development plan.

  An "offset" is the cancellation of an existing groundwater permit or certificate in favor of a new groundwater permit, provided that the existing groundwater use has a similar impact on surface water. An "offset" can be used to reduce part or the entire mitigation obligation of a new groundwater permit. Previously, use of offsets had been limited to use by any groundwater applicant only during the application process. OAR Chapter 690, Division 522, adopted by the Water Resources Commission in 2010, included provisions allowing municipal and quasi-municipal permit holders to incorporate "offsets" into their incremental development plans. Municipal and quasi-municipal permit holders, if requested during the application process, are allowed to provide mitigation incrementally as they grow into their water use under an incremental development plan (OAR 690-505-0625 and OAR 690-522-0040). Other permit holders are required to provide 100% of their mitigation before a permit may be issued (OAR 690-505-0615(1)(a) and OAR 690-505-0620(1)(b)).

  In addition, Division 522 allows the associated rate, or portion thereof, for a permit using offsets to not be counted under the 200 cfs allocation cap.

- Potential water quality impacts of the Mitigation Program;

  Issue statement from House Bill 3494 Report: Springs and groundwater have an impact on water quality, including temperature; however, the current mitigation program addresses only the water quantity impacts of proposed new ground water uses. In addition, there is no current process for tracking or addressing the potential cumulative impacts on water quality of the mitigation program in combination with other programs in the basin. The key issue is whether there

may be a "tipping point" where reduced spring and ground water inflow resulting from all water programs will cumulatively have a negative impact on water quality in the future.

The Group recognized that the science needed to analyze effects on spring inputs was beyond the scope of the Mitigation Program and outside of the Water Resource Department's area of expertise. Ultimately, the Work Group did not identify any immediate recommendations for improvements to the Mitigation Program. They did identify that more work is needed to address water quality in the context of water management for the Basin. Currently, stakeholders in the Deschutes Basin are working on the Upper Deschutes River Basin Study in cooperation with the U.S. Bureau of Reclamation, which may include evaluation of existing data to better understand the relationship of streamflow and water temperature.

- Timing of mitigation and non-irrigation season mitigation;

  Issue statement from House Bill 3494 Report: Under the Deschutes Mitigation Rules, mitigation is calculated on the basis of the annual volume of consumptive use, rather than on a cubic foot per second basis. While the annualized volumetric approach in the rules addresses the volume of consumptive use, the rules do not address the OWRD's estimate that ground water pumping impacts are uniformly distributed over all months of the year. Thus far, all mitigation water has been returned to the system during the irrigation season. While the additional flow to the system during the summer months is a positive effect, some have raised concerns about ground water pumping impacts on streamflow during the non-irrigation season.

  The Deschutes Work Group did not reach consensus for a recommendation on this issue. However, the Group did agree that dialog should continue and that this issue should be addressed in a broader planning process. This issue is also discussed in the "timing of mitigation" section of this report.

- Groundwater permits that were issued prior to the adoption of the Mitigation Program rules with a condition allowing for regulation of the use to protect scenic waterway flows.

  Approximately 188 permits were issued by the Water Resources Department after July 19, 1995, when the Scenic Waterway Act was amended to include groundwater provisions. These permits were issued with a condition allowing for regulation of the use if the use was determined to "measurably reduce[2]" scenic waterway flows. When the Mitigation Rules were adopted by the Water Resource Commission in 2002, these permits were not required to provide

[2] As used in ORS 390.835(9), "measurably reduce" means that the use authorized under subsection (9) of this section will individually or cumulatively reduce surface water flows within the scenic waterway in excess of a combined cumulative total of one percent of the average daily flow or one cubic foot per second, whichever is less.

mitigation under the new rules but rather allowed an opportunity for mitigation to avoid any future regulation. They key question discussed by the Work Group was whether the scenic waterway regulation condition, often referred to as Condition 7(j), had been triggered, and if so, how would the Department implement mitigation requirements.

Issue statement from House Bill 3494 Report: The term "7(j)" refers to a condition required by statute to be included in certain water right permits and certificates in the Deschutes Basin that were issued during the time period after SB 1033 was enacted in 1995, but before the ground water study results were available in 1998. In the absence of technical information to determine whether a proposed use would "measurably reduce" surface water flows, the statute allowed a new ground water permit to be issued with the condition that stated the groundwater use could be regulated in the future if analysis of data available after permit issuance discloses the use will measurably reduce the protected scenic waterway flows. Studies completed in 2001 show a connection between groundwater and surface water and, as a result, all new groundwater rights are now required to mitigate their use under the rules. The issue is whether the 7(j) condition has been triggered and, if so, how it should be implemented.

At the time, no consensus was reached by the Deschutes Work Group on these existing permits. This issue was also raised in stakeholder feedback requested as part of the development of this report and is discussed in more detail in the following section of this report.

Other issues were identified by the Deschutes Work Group, but the Group chose to focus on the above identified issues. One of the issues highlighted by the Work Group was the then existing sunset date for the Deschutes Groundwater Mitigation Program of January 2, 2014. HB 3623 (Chapter 694 Oregon Laws 2011) extended the sunset date on the Mitigation Program until January 2, 2029.

Pre Mitigation Program Permits (7J permits):

WaterWatch of Oregon identified in their feedback to the Department ongoing concern that not all permit holders that should be mitigating are required to provide mitigation. WaterWatch is specifically concerned with those groundwater permits issued prior to the adoption of the Mitigation Program and conditioned to allow for regulation of the groundwater use should the use be found to measurably reduce scenic waterway flows (condition 7J).

The term 7J refers to a condition included in certain groundwater right permits and certificates that were issued by the Department within or above a state scenic waterway after the Scenic Waterway Act was amended on July 19, 1995. Under the amended Scenic Waterway Act, the Department may issue new groundwater permits provided that the Department can make a finding that the use won't measurably reduce scenic

waterway flows. If the Department is unable to determine that the proposed use will measurably reduce scenic waterway flows, a new permit may be conditioned to allow for regulation of the use should it be later determined to measurably reduce scenic waterway flows.

In 1998, technical information became available to demonstrate that new groundwater use in the Deschutes Basin would measurably reduce scenic waterway flows. New groundwater permits could only be issued if mitigation were provided. The Deschutes Groundwater Mitigation Program was developed to enable applicants to obtain new groundwater permits. The Mitigation rules also provided an opportunity for groundwater permit, or subsequent certificate holders, issued prior to the adoption of the Mitigation Program rules, to mitigate for their impacts on surface water flows to avoid any future regulation for reductions to scenic waterway flows, consistent with their permit condition (7J).

From 1995 to 1998, the Department issued 188 groundwater permits for a total of approximately 182 cfs with the scenic waterway condition allowing for regulation if the use(s) were determined to measurably reduce scenic waterway flows. In 1998, when an ongoing groundwater study was substantially complete and study results were showing that new groundwater appropriations would measurably reduce scenic waterway flows, the Department put pending groundwater permit applications on hold and convened the Deschutes Steering Committee to help develop a mitigation plan for the Deschutes Basin. Before the Mitigation Program rules were developed and adopted by the Water Resources Commission on September 13, 2002, four permits were issued in the DGWSA. Each of the four permits contained mitigation requirements. Two of these permits have since been cancelled.

From the 184 permits issued, 54 certificates were issued and 35 permits have been cancelled. Some of the remaining permits, for which certificates have not yet been issued, may not yet be fully developed and may require extensions of time. One option that the Department is considering is whether mitigation should be required for any of these permit holders seeking extensions of time for undeveloped portions of their permits.

Modification to presentation of flow data:

ODFW requested that the Department provide flow data in a form more relevant to fish needs, such as improvements in low flows, variability in flows throughout the year, and flows during critical time periods for fish.

The streamflow review criteria for the Deschutes Groundwater Mitigation Program (OAR 690-505-0500(3) requires evaluation of the program to determine whether scenic waterway flows and instream water right flows continue to be met on at least an equivalent or more frequent basis as compared to long-term representative base period flows established by the Department. Additional discussion with ODFW is needed to ascertain whether any changes are needed under the Mitigation Program or if data can

be obtained from OWRD that would assist ODFW in the assessment of flows necessary for fish on various streams and rivers in the Basin.

Allocation cap should remain unchanged:

ODFW, WaterWatch of Oregon, and Central Oregon LandWatch identified that the 200 CFS allocation cap should not be raised at this time. ODFW identified that the current allocation cap ensures that groundwater impacts to winter flows remain at a minimum. They identified that until such time as issues associated with groundwater impacts outside of the irrigation season can be addressed, the cap should not be adjusted. WaterWatch of Oregon further identified that all issues raised in the House Bill 3494 (Chapter 669, Oregon Law 2005) Legislative report should be resolved before consideration of raising the allocation cap. They also point out that there is still additional room under the allocation cap for development. In 13 years under the Mitigation Program, up to 135 CFS has been debited form the allocation cap for new groundwater uses.

At this time, the Department does not anticipate an immediate need to change the 200 CFS allocation cap. The Mitigation Program has been in place for over 12 years. Assuming all currently pending applications and final orders move forward as proposed, there will still be approximately 32 cfs left under the 200 cfs "cap." However, once the cap limit is met, no additional permits can be issued without the Water Resources Commission modifying its rules and adjusting the cap. The Department would like to explore, with our stakeholders, the issue of modification of the allocation cap during the next 5 year review cycle for the Mitigation Program.

Need for more permanent mitigation, monitoring and compliance:

Several stakeholders raised issues associated with use of temporary mitigation credits (instream leases). One commenter was uncertain how temporary mitigation could be used for a new groundwater permit considering that mitigation must be provided for the life of that groundwater use. In recent years the Department has consistently identified several permit holders that have failed to continue providing mitigation when the source has been temporary mitigation based on instream leases. Stakeholders suggested that coordination with Mitigation Program partners is needed to provide a larger supply of permanent mitigation water. In addition, a clearly defined process needs to be established to address permit holders that fail to provide mitigation on an annual basis. One stakeholder also asked how often mitigation activities are monitored and regulated when mitigation is not occurring.

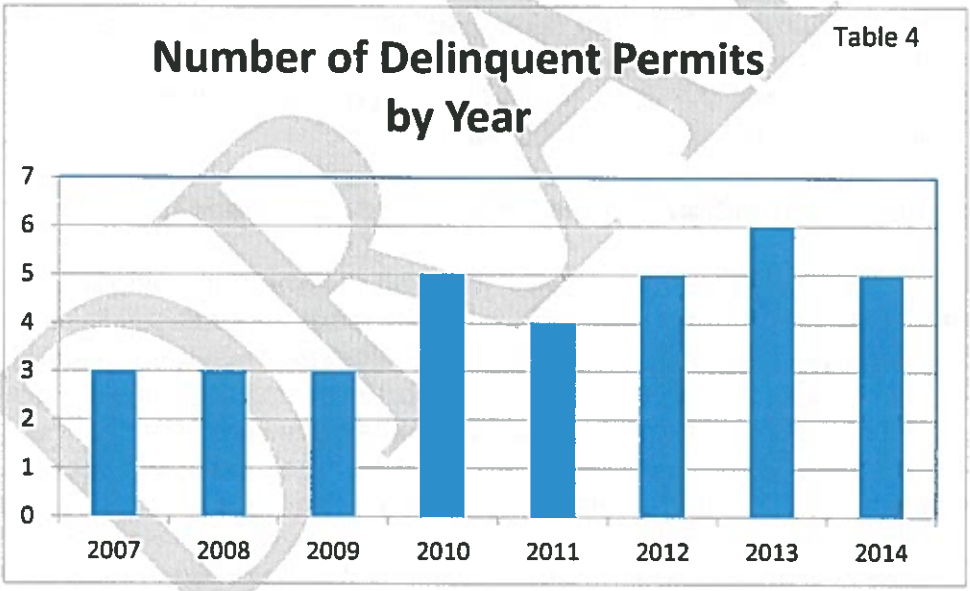
In general, the source of mitigation provided by a groundwater permit applicant may be permanent, temporary or a combination of both. Instream leases are one of the identified sources of mitigation identified under OAR 690-521-0300(1)(b) but may only be established through a Mitigation Bank chartered by the Oregon Water Resources Commission. Temporary mitigation (instream lease based mitigation) may be obtained from the DRC Mitigation Bank, a mitigation bank chartered by the Oregon Water

Resources Commission, which primarily brokers temporary mitigation credits issued by the Department. Some permit holders that have used temporary mitigation as their mitigation source have failed to continue providing that mitigation. By rule and by permit condition, every groundwater user with a permit issued under the Deschutes Groundwater Mitigation Program is required to maintain mitigation for the life of the groundwater use. The permit holder is responsible for maintaining any temporary mitigation being used annually with the DRC Mitigation Bank.

Since groundwater permit holders using temporary mitigation credits need to obtain mitigation credits on an annual basis, there is the risk of groundwater users failing to maintain the required mitigation. Under the Mitigation Program, when a permit holder fails to maintain their source of mitigation, OWRD is required, under OAR 690-505-0620, to regulate the use, deny any permit extension request, and possibly cancel the permit.

This issue was first identified in 2007. The table below shows the number of delinquent permits by year. Several of the permit holders did not have mitigation in place for a year or two and then continued providing annual mitigation. Others without mitigation have been cancelled either voluntarily or by the Department under statutory authority to cancel permits.

Table 4



The Department visited the sites of each of the five permits that did not provide mitigation in 2012. The primary use involved was irrigation. Department staff identified that (1) the well had not been drilled nor had water been used, (2) that the users provided mitigation initially but did not appear to have developed the water use, or (3) in two cases it was unclear if any water had been used under the permits because the place of use had other sources of water.

In 2013, two of the permits delinquent on mitigation were quasi-municipal permit holders that had elected to provide mitigation under an incremental development plan. One of

these permit holders has not yet developed their water use and did provide mitigation in 2014. The other was using water but had only provided a portion of the mitigation needed. The Department has worked with this permit holder over the last couple of years to get them back on track. They are currently providing sufficient mitigation and are required to provide monthly reports on their use. This will enable the Department and the permit holder to track water use under this permit as compared to the amount of mitigation provided.

One permit holder that did not provide mitigation in 2013 and 2014 has been using water. During the 2015 irrigation season, the Department pursued regulation of the use and compliance with mitigation requirements. Lack of compliance with permit conditions, including mitigation, resulted in cancellation of the permit. The permit holder is currently working with the Department to comply with permit conditions, has provided the required mitigation, and is requesting that the permit be reinstated.

The DRC Mitigation Bank has diligently tried to contact any permit holder that did not appear to be on track with obtaining annual mitigation from the Bank. A few of these permit holders have reestablished mitigation with the Bank, while a few, as noted above, have not.

Two permit holders have been clearly identified as using groundwater without full mitigation in place. For one, as identified above, the Department is working with the permit holder and may reinstate the permit. For the other, also as described above, the Department has worked with that permit holder to get them back on track with their incremental development plan and is requiring monthly reports on their water use. The intent is that both the Department and the permit holder can better track water use under that permit and address any mitigation issues before they happen.

The Department has identified that a more robust and clear process for addressing permits without mitigation is needed and will be working with local staff and the DRC Mitigation Bank to develop an active process that will include regulation and compliance actions.

Through evaluation of this issue, the Department also identified what appears to be a limitation under current rules and statutes. Under OAR 690-505-0620(1)(f) and (3), Department may pursue cancellation if mitigation is not maintained. However, it is not clear that current statutes allow for cancellation of permits for failure to meet this type of permit condition. The Department may, under ORS 537.410, cancel a permit for failure to commence or complete construction or to properly apply water to beneficial use. The Department may also cancel a permit under ORS 537.260 for failure to submit a claim of beneficial use by the deadline specified in the permit. Thus far, the Department has relied upon cancellation under ORS 537.260.

Another issue raised by stakeholders is the reliability of temporary mitigation. The amount of mitigation available annually from temporary mitigation sources (instream leases) may vary from year to year. And there are some areas of the Basin where

mitigation, both temporary and permanent, is not as readily available. Given that mitigation has originated from conversion of existing surface water rights to instream use (instream transfer and instream lease), the DRC Mitigation Bank identified that there may not be sufficient surface water rights in in a few zones of impact to be used as mitigation. For example, the Upper Deschutes Zone of Impact. To date, no mitigation projects have originated in the Upper Deschutes Zone. Mitigation for this Zone has been provided by mitigation originating in the Little Deschutes Zone of Impact.

As part of their feedback to the Department, the DRC Mitigation Bank asked what the responsibility is of the Bank or actions of the Department should temporary mitigation be available in a Zone one year but not the next. To date, there has been sufficient temporary mitigation in each Zone of Impact where groundwater permit holders are being provided mitigation through the DRC Mitigation Bank. But there has been at least one year when it was initially uncertain that there would be sufficient mitigation. If this were to occur, the Department anticipates that it would work with the DRC Mitigation Bank to see if mitigation could be secured and, if unavailable, may need to regulate groundwater uses without mitigation. The Department will continue to pursue this issue with the DRC Mitigation Bank.

One responsibility of the DRC Mitigation Bank, to assist in the prevention of lack of mitigation, is to maintain a reserve of mitigation credits. For every temporary mitigation credit assigned to a groundwater permit, the Bank is required to maintain another like credit in reserve.

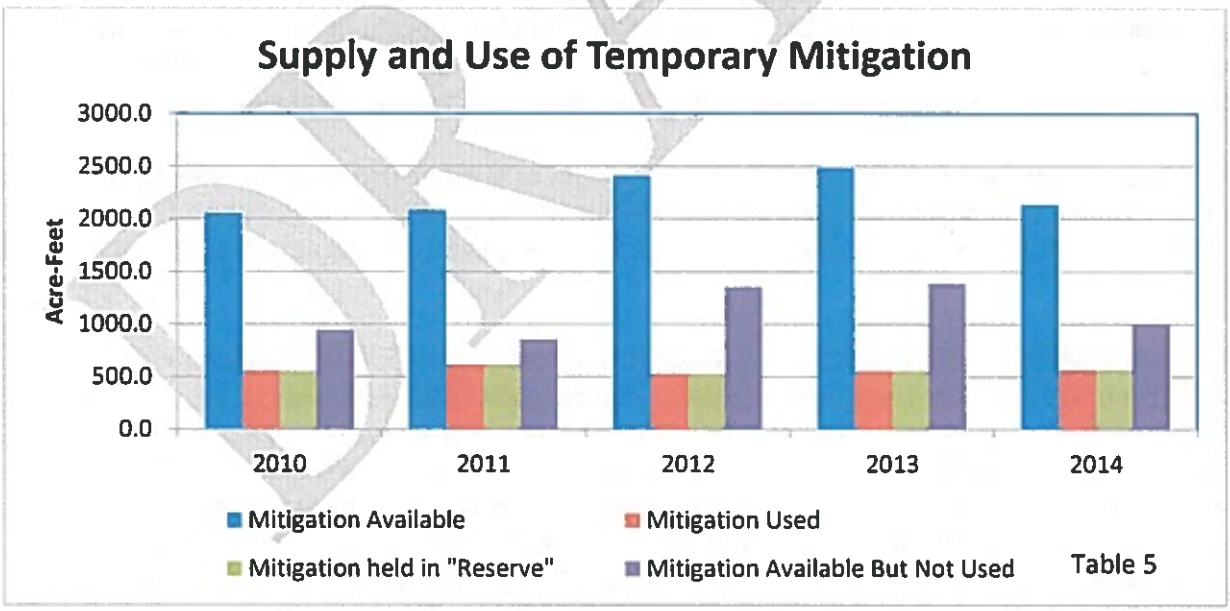


Table 5

In general, the amount of temporary mitigation provided through instream leases has exceeded the amount of mitigation needed for those permit holders using this as their primary source of mitigation. And has thus far been a reliable source of mitigation. But should the supply of mitigation provided by instream leases decrease and/or additional

permit holders fail to provide the required mitigation, OWRD may also need to reevaluate how instream leases are used for mitigation purposes.

Preferably, those using temporary mitigation credits would convert to permanent mitigation over time. As the mitigation program has grown from year to year, the amount of permanent mitigation has also grown and has surpassed the amount of temporary mitigation.

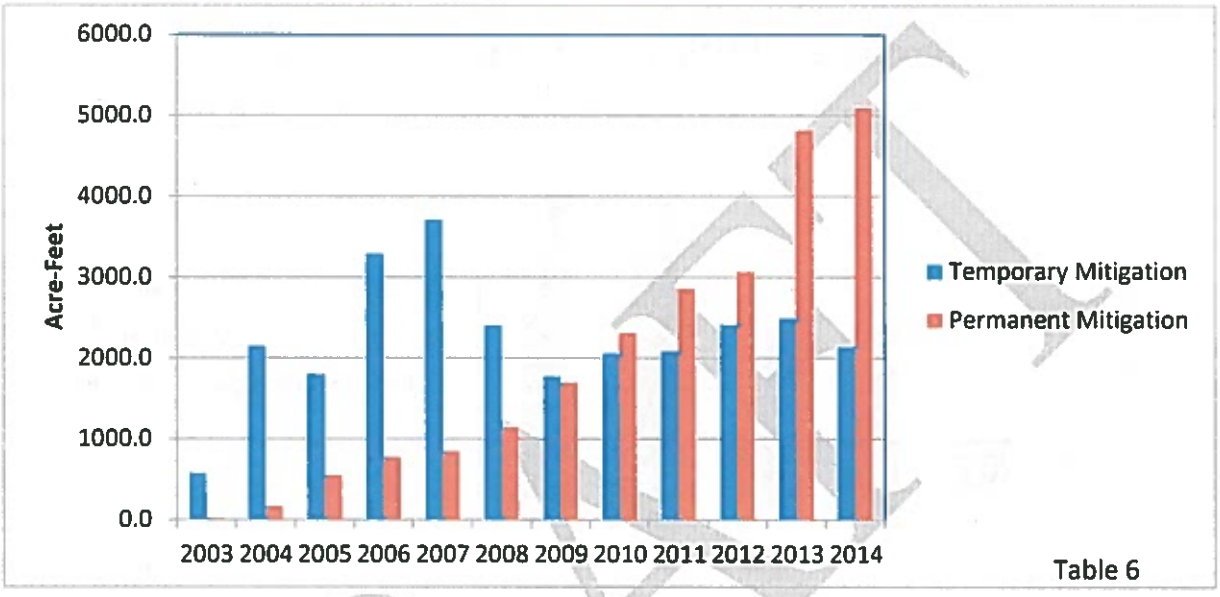


Table 6

The Department is in the process of reviewing an additional 15 permanent mitigation projects (instream transfers) that will, if approved, provide permanent mitigation in several zones of impact, including the Upper Deschutes Zone of Impact and, for the first time, the Metolius River Zone of Impact.

In the first five years of the mitigation program, instream leases represented 86% of the total volume of mitigation water (in acre-feet) established under the program each year (2003 through 2007). However, since then, this has changed. From 2010 through 2014, instream leases have averaged approximately 40% of the total volume of mitigation water established under the program. While the volume of mitigation water established by instream leases has declined from where it was in 2007 (3710 AF), the annual volume has remained fairly steady, around 2100 AF. The amount of mitigation water established through permanent instream transfers has significantly increased annually, lowering the ratio between instream leases and instream transfers. In 2007, the amount of mitigation water established through instream transfers was 848 AF. In 2014, 5097.0 AF of mitigation water had been established through permanent instream transfers.

The City of Bend identified in their feedback to the Department that the supply of permanent mitigation has been insufficient to meet the needs of municipalities. The temporary credits that have been available do not meet the needs of municipalities because they lack certainty. They also identify that because the supply of permanent

mitigation credits that there no reliable way to estimate the cost and timing of when permanent mitigation credits will become available. According to Bend, this is an element in the development of accurate and timely financing strategies for municipalities. It is nearly impossible to estimate cost and timing of mitigation credit purchases, when there are no credits to purchase. In addition, Bend has identified that the process of developing mitigation credits is complicated and subject to "countless" public interest challenges and review complications.

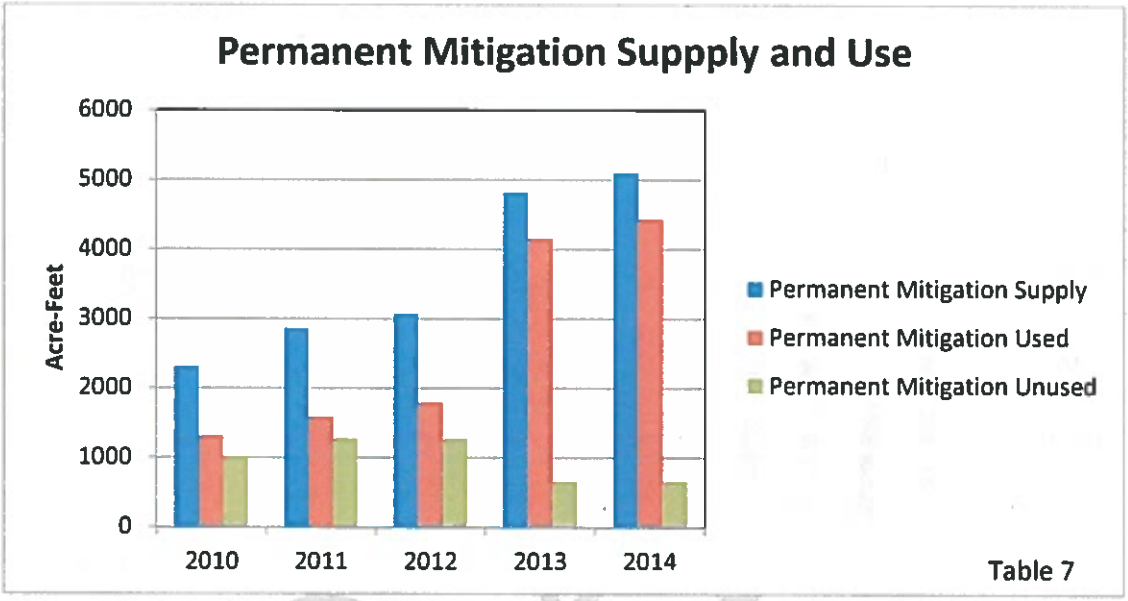


Table 7

The source of permanent mitigation projects has been instream transfers. Instream transfers are reviewed under with the same processing steps and criteria as any transfer processed by the Department. To be approved, a transfer must not result in injury to other water rights or enlargement of the originating water right.

The establishment of permanent mitigation credits has steadily increased from year to year under the Mitigation Program (Table 7). Several projects have been developed for specific groundwater uses. However, there remain some permanent mitigation credits unused from year to year. For example, in the General Zone of Impact approximately 506 mitigation credits remained available for use at the end of 2014. There are also 14 permanent mitigation projects pending with the Department. Over the last year, the Department has increased its processing capacity for these projects, which should result in additional permanent mitigation that could be made available for use by groundwater permit holders and applicants. The Department also intends to continue discussions with its stakeholders to develop mitigation projects as well as identify and explore options for creating additional permanent mitigation.

Mitigation Project Review Process:

The City of Bend also identified in their feedback to the Department that they have found the process under which each permit holder must secure their own mitigation as

inefficient, costly and extremely slow. This can be a significant impediment to groundwater use planning for municipalities.

The Department agrees that the process to establish permanent mitigation has been slow. During the first years of the Mitigation Program, only a small number of staff were assigned to the Program. In 2014, the Department began to undertake changes to the instream transfer program, the source of permanent mitigation. The primary change has been to add additional staff capacity to this program. Three additional staff have been trained to review instream transfers as well as instream transfers being used to establish mitigation. The Department anticipates assigning at least one additional staff member to this work as well. With the added capacity, the Department anticipates that permanent mitigation projects will move more quickly and smoothly through the review process. As projects move through the process, the ability for Cities and others to plan accordingly should improve.

Need State Supported Framework for Permanent Mitigation:

The Cities of Bend and Redmond also identified that there should be a structure, such as a mitigation bank, to be a clearing house for permanent mitigation credits. This should be state funded and supported. The City of Bend asserted that the current system does not discourage speculation and that a state supported framework would discourage speculation. The City identified that this would also provide for a predictable and affordable supply of permanent mitigation credits. And would enable the Department to leverage multiple projects. An issue of concern is the identification of available mitigation credits for sale and use by groundwater permit holders and applicants needing to provide mitigation. The City of Bend identified that there is not a clear means of identifying mitigation credits that are actually available for sale and not just being held by the mitigation credit holders for their own use or another future use.

It is not clear that changes are needed to the existing Mitigation Bank and Mitigation Credit portions of the Mitigation Program, including the development of a state funded mitigation bank. However, the Department intends to continue discussions with the City of Bend and other appropriate stakeholders to explore mechanisms for establishing and identifying additional permanent mitigation. Outcomes of these discussions will be incorporated into the next report due to the Legislature in 2021, including any process and mitigation tool improvements.

One new tool currently under development is an updated tracking and accounting system for mitigation information. Currently the Department maintains a tracking system of mitigation credits, mitigation credit holders and use of mitigation credits. This information is available upon request from the Department. However, this information has been historically tracked using spreadsheets. After the program sunset date was extended from 2014 to 2029, the Department identified a need to develop a permanent database in which to track information associated with the mitigation program. At this time, the Department has developed the database and is working on refining and implementation. The database will result in information regarding unused mitigation

credits and mitigation holders being more readily available upon request or potentially as information that may be queried from the Department's web page.

Consumptive Use:

The Department of Environmental Quality (DEQ) identified that as water systems become more efficient, OWRD will need to accurately determine consumptive use for new uses to better estimate mitigation obligations. They also identified that it would be helpful to understand how the consumptive use coefficients are determined for each mitigation obligation.

The Department uses a standardized set of consumptive use coefficients to determine mitigation needs in the DGWSA. The coefficients used are the same as those used in other programs of the Department, including the Department's Water Availability Model.

The following consumptive use coefficients are used by the Department for determining mitigation obligations of proposed groundwater permit applications:

- Irrigation: 1.8 acre-feet per acre
- Municipal Use (year round): 40% of the annual volume
- Mining (such as gravel washing): 50% of the annual volume
- Domestic Use: 20% of the annual volume
- Commercial Use: 15% of the annual volume
- Agricultural Use (such as temperature control): 50% of the annual volume
- Storage and maintenance for a small reservoir/pond: 2.67 acre-feet per surface area acre
- Industrial use: 10% to 100% of the annual volume depending on the type of use

Other uses are reviewed on a case by case basis. The consumptive use coefficients identified are averages. If an application, or other information provided to the Department (such as through public comment), suggests that the consumptive use should be higher or lower, the Department will evaluate the application using the best information available.

In addition, during the permit application process, the applicant and the public are provided opportunities to raise issues of concern that may not have been initially identified by the Department. There is a 30 day open comment period following issuance of the first report in the Department's permit application review process, the Initial Review. There is also a 30 day protest opportunity following issuance of the second report, the Proposed Final Order. In addition, between the Initial Review and the Proposed Final Order, for groundwater permit applications within the DGWSA, there is an additional opportunity for the Oregon Department of Fish and Wildlife, Department of Environmental Quality, Oregon Parks and Recreation Department, and Oregon Division of State Lands to weigh in on a proposed groundwater use once the applicant has identified how they intend to provide mitigation.

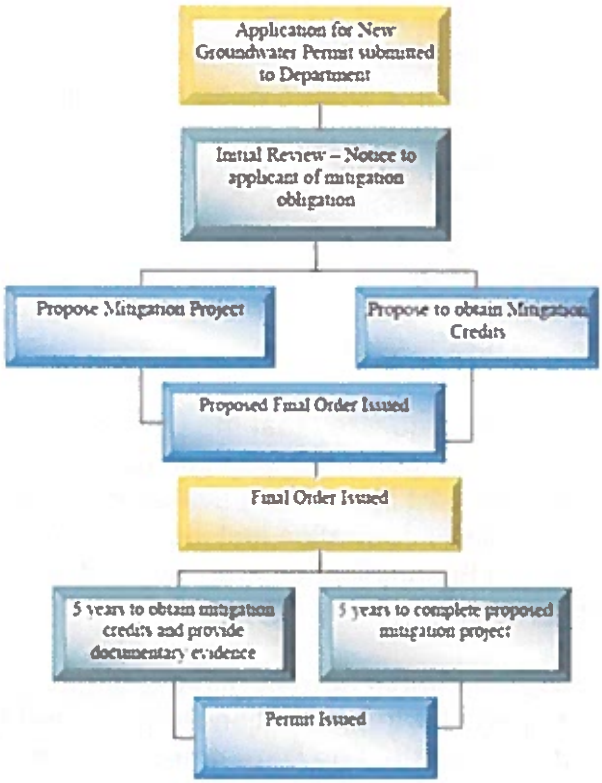


Figure E: Process to establish new ground water uses under the Deschutes ground water mitigation program.

Each groundwater permit issued under the Mitigation Program is also conditioned to require additional mitigation should the Department determine that the average annual consumptive use has increased beyond the originally mitigated amount. OAR 690-505-0620(1)(g)

At this time, the Department does not anticipate changing how mitigation obligations are calculated. However, should better information become available for consumptive use estimates, the Department would review that information and determine whether any changes or updates are needed. One stakeholder, for example, raised concern that the consumptive use estimates for golf courses may not be sufficient.

Permanent mitigation credits used temporarily:

John Short for Water Right Services, the Deschutes River Conservancy and the City of Bend, identified that it would be beneficial to have a mechanism in place to allow permanent mitigation credits to be assigned temporarily to a groundwater permit. Permanent mitigation credits may not have a secured need for several years but there are permit holders that could use them "temporarily" in the interim. The City of Bend identified that this could provide more certainty than the use of temporary mitigation based on instream leases.

It is not clear that there is a need for temporary assignment of mitigation credits at this time. However, the Department does anticipate that changes will need to be made to the Mitigation Program rules based upon identified programmatic improvements. During a rulemaking process, additional rule modifications can be suggested and discussed by a rules advisory committee, including Mitigation Program stakeholders, for broader discussion. As part of that collaborative process, the Department and stakeholders may then identify whether such a change is needed and/or could be implemented.

Mitigation information:

The DRC requested that the Department develop additional pamphlet and other information tools for applicants needing to participate in the Mitigation Program. They identified that information available for the Mitigation Program is not easily obtained. Suggested information includes research steps prior to submission of an application, the steps in the application process, and information on mitigation maintenance and risk if mitigation is not maintained.

The Department agrees with the feedback provided by the DRC and will be reviewing its web page for the Mitigation Program and making appropriate updates and improvements. The Department will also work with local staff to develop updated information tools and documents to share with those seeking new groundwater permits in the DGWSA.

Instream Water Right and Scenic Waterway Flow Evaluation

WaterWatch identified that this report should include an evaluation of instream flows. The Deschutes River Conservancy also identified that a flow evaluation is part of evaluating the effectiveness of the Mitigation Program. The Department annually evaluates the Mitigation Program and provides a more in depth evaluation of the Mitigation Program to the Water Resources Commission every five years, including an instream water right and scenic waterway flow evaluation. The last five year evaluation of the Mitigation Program for the Water Resources Commission was completed on March 6, 2014, and may be found on the Department's web site at http://www.oregon.gov/owrd/docs/Deschutes_2nd_5yr_report.pdf.

Consideration of the Impacts of Exempt Wells

Central Oregon LandWatch identified that they were concerned with the lack of discussion in this report with regard to impacts from use of exempt wells. Use of water from exempt wells is not part of the Deschutes Groundwater Mitigation Program and is tracked by other programs of the Water Resources Department.

Identification of Regulatory and Statutory Changes that may Improve the Program in Order to Address and Mitigate Injury to Existing Water Rights and Spring Systems and to Offset Measurable Reductions of Scenic Waterway Flows

Process Improvement for Permits without Mitigation:

The Department, along with several stakeholders, has identified a need for the Department to improve how it addresses those permits where the permit holder has failed to continue providing annual mitigation. There is the potential for permits without mitigation, where water is being put to use, to injure existing water rights and affect scenic waterway flows.

Each groundwater permit issued by the Department under the Mitigation Program is conditioned to require that mitigation be provided for the life of the permit, and subsequent certificate. Each groundwater permit is also conditioned to allow the Department, should mitigation discontinue, to regulate the groundwater use, to deny any request for a permit extension, and to propose cancellation of the permit.

The Department will work with local staff and the DRC to develop and implement a more proactive process for addressing permits without mitigation. In general, this would primarily only affect groundwater permits where the source of mitigation is temporary. Permanent mitigation is generally linked to a groundwater use for the life of that groundwater use.

The Department will also likely be undertaking rulemaking to strengthen mitigation requirements, specifically with regard to temporary mitigation use, and steps to address permits where mitigation has discontinued. Any changes to the rules regarding use and maintenance of temporary mitigation will be considered with a rules advisory committee and public rulemaking process.

As part of this evaluation, the Department has identified that its ability to cancel permits for failure to provide mitigation may be limited. A permit may be cancelled voluntarily by the permit holder. A permit may also be canceled under ORS 537.260 for failure to submit a claim of beneficial use. Permits are conditioned, generally, to require the development of the water use within 5 years from permit issuance. Municipal permits are conditioned to allow 20 years for development of the permit. Permit holders are then required to submit a claim of beneficial use report prepared by a Certified Water Rights Examiner within a year from that deadline unless the deadline is extended by the Department. The Department may cancel a permit under ORS 537.260 for failure by the permit holder to submit the claim of beneficial use within the required timeframe.

The Department may also cancel a permit under ORS 537.410 for failure to commence or complete construction work and/or for neglecting to apply the water to beneficial use within the timelines allowed under the permit. This statute also appears to allow cancellation of the permit after the timeframe for permit development has expired. In

this respect, this cancellation statute appears to be similar to the timeframes allowed for cancellation under ORS 537.260.

It is not clear that the Department may cancel a permit under either of the statutes described above for failure to maintain mitigation. Of the permits cancelled by the Department, where mitigation was not provided, three have been voluntarily cancelled and four were cancelled under ORS 537.260. By using ORS 537.260, the Department has been able to cancel permits where mitigation has discontinued and has not been reestablished. However, generally several years may go by with no mitigation being provided before the Department may be able to cancel the permit. It's important to note that for those permits cancelled under ORS 537.260 through 2014, the Department did not identify any ongoing water use.

Given the apparent limitations in permit cancellation, it is important for the Department to have a proactive approach for tracking and addressing permits where mitigation has been discontinued. An update on this issue will be provided to the Legislature as part of the next evaluation of the Mitigation Program due in 2021. In the interim, the Department will explore it's authority to cancel permits, implement a more proactive response to these permits and identify if any statutory or additional rule changes are necessary.

Mitigation Requirements for Undeveloped Permits when Extension is Requested:

As previously identified there were approximately 188 groundwater permits issued by the Department within what is now the Deschutes Groundwater Study Area (DGWSA) after the Scenic Waterway Act was amended in 1995. As part of the 1995 amendment to the Scenic Waterway Act, the Department was required to identify whether a proposed groundwater use (within or above a state scenic waterway) would measurably reduce scenic waterway flows. Where that determination couldn't be made, the Department could issue a new groundwater permit that was conditioned to allow for regulation should the groundwater use later be found to cause a measurable reduction in scenic waterway flows. This condition is often referred to as "condition 7J."

The Scenic Waterway Act also identified that this requirement would be applied to groundwater permits issued after July 19, 1995. In addition, groundwater permits are only subject to those scenic waterway flows in effect as of the priority date of the permit. The Deschutes Scenic Waterway flows were established and adopted by the Water Resources Commission on April 19, 1991. Of the 188 groundwater permits issued after July 19, 1995, 7 appear to have priority dates prior to April 19, 1995, and are not subject to the provisions under the Scenic Waterway Act but may have been conditioned to allow for regulation of the use similar to other permits issued after July 19, 1995, for scenic waterway flows.

Lack of mitigation requirements associated with the permits issued with the "7j" condition was one of the issues identified by a few stakeholders, including WaterWatch of Oregon. Under the existing Mitigation Program rules, these permit holders are not

required to provide mitigation but are provided an opportunity under the Mitigation Program to provide mitigation to avoid any future regulation for scenic waterway flows.

Of the permits issued after July 19, 1995, 54 have been issued certificates by the Department and were developed to the extent claimed and/or identified by the Department. Some of the associated groundwater uses were developed for less than what had originally been requested.

Another 35 of the original permits issued after the scenic waterway act was amended have been cancelled.

The remaining portion of the 188 permits issued after July 19, 1995, may not be fully developed and may need extensions of time to complete development of the groundwater use. The Department may grant extensions of time under OAR Chapter 690, Division 350 (Water Right Permit Extension). The Department is proposing to explore mitigation requirements for those portions of permits not yet developed for which extensions of time may be necessary. The Department will explore this option further with stakeholders and may undertake additional rulemaking under the Mitigation Program and Water Right Permit Extension rules.

Deschutes Groundwater Model and other Technical Improvements:

The Department is currently in the process of working with US Geological Survey to update the Deschutes Groundwater Model. The updated model may do a better job of simulating groundwater/surface water interaction in the DGWSA than the existing groundwater model. Utilization of the updated model (when available) may also assist the Department in reviewing impacts of the mitigation program on springs and timing of mitigation.

The Department is also currently developing a database to track information about the Mitigation Program. A significant amount of data has historically been tracked using spreadsheets. The Department would like to improve its ability to track, generate reports and provide information to the public.