House Bill 4113 (2016)

Report of the Task Force on Drought Emergency Response

State of Oregon

November 1, 2016

REPORT OF THE TASK FORCE ON DROUGHT EMERGENCY RESPONSE

Established by House Bill 4113 (2016)

Executive Summary of the Report of the Task Force on Drought Emergency Response

Background: House Bill 4113 (2016) established the Task Force on Drought Emergency Response and directed the Task Force to research and evaluate potential tools to prepare for or deal with drought emergencies. The bill further provided that the Task Force may: (1) Evaluate the sufficiency of existing tools to address short-term drought response needs and recommend additional tools to address short-term drought response needs; (2) Identify options to minimize the impact of drought on agricultural, municipal, and other interests; (3) Identify options to minimize the impact of drought on fish and wildlife; (4) Identify tools to assist small water providers in developing water management, conservation or efficiency plans and in anticipating drought risks and responses; (5) Identify the data and resources necessary for anticipating drought and drought impacts on the economy, communities and the environment; and (6) Recommend improvements in information sharing necessary for enabling the public, water users and recreational in-stream users to understand drought conditions and to assist in efforts to mitigate or adapt to drought.

Task Force Membership and Decision-Making:

In accordance with House Bill 4113, the Oregon Legislature appointed four Task Force members:

Senator Arnie Roblan, appointed by the Senate President
Representative Ken Helm, appointed by the Speaker of the House
Richard Kosesan, Water for Life, appointed by Senate Minority Leader
Mary Anne Nash, Oregon Farm Bureau, appointed by House Minority Leader

In addition, the Governor appointed eleven members to the Task Force:

JR Cook	Industrial	Northeast Oregon Water Association
Suzanne DeLorenzo	Municipal	Clackamas River Water
Brett Golden	Conservation	Deschutes River Conservancy
Jason Green	Municipal	Oregon Association of Water Utilities
Rodney Park	Agriculture	Parks Nursery
Kimberley Priestley	Conservation	WaterWatch of Oregon
Eric Quaempts	Tribal	Confederated Tribes of the Umatilla Indian Reservation
Robert Rees	Conservation	Association of Northwest Steelheaders
Daniel Shoun	County	Lake County Commissioner
Julie Smitherman	Municipal	City of Ashland
April Snell	Irrigation Districts	Oregon Water Resources Congress

Senator Roblan and Representative Helm were appointed to serve as Co-Chairs by unanimous vote of the other members of the Task Force. The Co-Chairs elected to be non-voting members of the Task Force. A majority of the Task Force (seven members) was required to approve recommendations; however, the Task Force strove to reach consensus.

The Task Force met seven times between July and October. Ideas that were not recommended by the Task Force – due to a lack of time to refine the concept, a lack of agreement, or other reasons – have been captured in the working documents and materials of the Task Force, as well as in Appendix D of the report.

Recommendations: A summary of the recommendations approved by the Task Force are provided below; however, more in-depth actions needed to implement each recommendation are highlighted in full within the report. Actions were not prioritized by the Task Force; therefore, the ordering of actions should not be construed as a prioritization. In addition, some members noted that the level of support for budget-related proposals may change with a clearer understanding of the status of the State's budget.

The Task Force approved the following recommendations:

A. The State should continue to increase and enrich water-related data collection to inform water use decisions, conservation, and management, as well as better anticipate and respond to drought.

B. Provide resources for assessments of drought impacts, risks, and vulnerabilities on instream and out-of-stream sectors in order to better prepare for, respond to, and recover from drought.

C. The State should review the drought declaration process and tools to ensure drought declarations are effective to assist with emerging drought response.

D. The Legislature should look at establishing a drought emergency fund for instream and out-of-stream needs.

E. Provide OWRD with staff resources to do outreach and communication. Develop communication tool box to educate all sectors and elected officials about existing tools, water conservation, drought conditions and preparedness, and help small communities respond to drought.

F. The Legislature should look at establishing a fund for drought planning to help communities be better prepared and more resilient to drought.

G. Provide funding for additional watermaster staff and tools to make water distribution more efficient.

H. Need to address lack of planning, support, resources, and technical assistance for small water systems to be better prepared for drought.

I. Assemble a group of experts to evaluate and identify existing infrastructure programs and evaluate barriers to accessing infrastructure funding. Provide technical assistance or capacity building grants to help individuals and communities identify, apply for, and access infrastructure funding to improve drought resiliency.

J. Evaluate management options for stored water to better address current and future instream and out-of-stream needs.

K. The Legislature should look at measures and incentives to promote water conservation and efficiency.

L. The Legislature should consider additional programs to facilitate restoration of streamflows through voluntary means during times of drought.

M. Oregon should continue to encourage water reuse activities throughout the state, while giving due consideration to the protection of instream flow, water quality, public health, and drinking water sources.

For More Information: Questions about the report should be directed to Racquel Rancier, Senior Policy Coordinator, Oregon Water Resources Department, at racquel.r.rancier@wrd.state.or.us. A copy of the full report is available online at: www.oregon.gov/owrd/Pages/HB_4113.aspx.

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I. Introduction

Background on House Bill 4113 (2016)

Drought is not an abnormal event in Oregon, with notable droughts occurring in 1976-77, 1992, 2001-02, and 2015 (OEM & OWRD, 2016, p. 6). In 2015, Oregon experienced severe to extreme drought conditions across the entire state, according to the U.S. Drought Monitor. The 2015 drought was prompted by warmer than normal temperatures, record-low snowpack, and, in some parts of the state, below-normal spring and summer precipitation. The result was record-low to near-record-low streamflows in most parts of the state. The Governor declared drought in 25 of Oregon's 36 counties, the most since 1992, when a statewide drought declaration was issued (OWRD, 2015a).

Water is vital to Oregon's ecosystems, communities, and economy. In most areas of the state, surface water is no longer available for new uses in summer months. Groundwater supplies are also limited in some areas. Although Oregon often has the reputation as a wet state, the availability of surface water depends greatly on the location and timing of precipitation. Precipitation varies depending on location, and also between seasons, typically occurring between the months of October and May; however, peak water demand generally occurs in the summer. Rainfall is essential for coastal areas where snowpack is not a significant contributor to streamflows and water supplies.

As shown by the 2015 drought, parts of Oregon are highly dependent on springtime snowpack to meet competing water demands. Predicted changes in climate are expected to result in increased temperatures, declining snowpack, and earlier spring snowmelt, likely leading to more frequent droughts like the one seen in 2015. Meanwhile, population growth, longer growing seasons, and warmer temperatures are likely to increase demands for water for instream purposes as well as out-of-stream purposes.[1]

The 2015 drought highlighted the need to develop solutions to meet our instream and out-of-stream water resources needs now and into the future. Such efforts have been underway for several years, with the 2015 Oregon Legislature providing more than $50 million in funding to plan for, evaluate, and implement water resources projects (such as water conservation, reuse, storage, etc.).[2] However, the effects of drought are far-reaching – impacting agriculture, communities, fish, wildlife, and recreation – and water resource projects take time to plan, develop, and implement. As the State invests in helping communities meet long-term water needs, the State also needs to ensure that it has effective tools to immediately respond to drought as it is occurs.

As a result, House Bill 4113 (2016) established a Task Force to review the State's existing drought response tools, identify potential gaps, and make recommendations on tools and information needed to ensure that the State is prepared to respond to drought in the future.

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[1] As used in this document, "instream and out-of-stream" is intended to be inclusive of water use sectors that use water for consumptive (agriculture, municipal, industrial, etc.) and non-consumptive uses (fish, wildlife, recreation, navigation, etc.). It is intended to be inclusive of both groundwater and surface water uses and should not be construed to exclude groundwater.

[2] Authorizations for Oregon Water Resources Department's funding programs are highlighted here. Other funding programs exist; however, there is no comprehensive list as discussed later in this report.

Specifically, House Bill 4113 (2016, §1(4)) directed the Task Force to research and evaluate potential tools to prepare for or deal with drought emergencies. The bill further provided that the Task Force may also consider drought response tools, as well as needed information and data as outlined below:

- Evaluate the sufficiency of existing tools to address short-term drought response needs and recommending additional tools to address short-term drought response needs;
- Identify options to minimize the impact of drought on agricultural, municipal, and other interests;
- Identify options to minimize the impact of drought on fish and wildlife;
- Identify tools to assist small water providers in developing water management, conservation or efficiency plans and in anticipating drought risks and responses.
- Identify the data and resources necessary for anticipating drought and drought impacts on the economy, communities and the environment;
- Recommend improvements in information sharing necessary for enabling the public, water users and recreational in-stream users to understand drought conditions and to assist in efforts to mitigate or adapt to drought.

Task Force Membership and Staffing

In accordance with House Bill 4113, the Oregon Legislature appointed four Task Force members:

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Senator Roblan and Representative Helm were appointed to serve as Co-Chairs by unanimous vote of the other members of the Task Force.

Racquel Rancier, Senior Policy Coordinator, and Lanaya Blakely, Research Assistant, provided primary staff support to the Task Force on behalf of the Oregon Water Resources Department (OWRD).

Other staff from the OWRD, as well as from the Oregon Office of Emergency Management, Department of Land Conservation and Development, and Oregon Health Authority provided information and reviewed portions of the report for accuracy. In addition, Oregon Department of Fish and Wildlife and Oregon Department of Agriculture staff assisted Task Force members on questions related to specific proposals.

Task Force Decision-Making

The Task Force met seven times between July and October. Task Force members brainstormed a list of ideas and topics at the first and second meetings, with the remaining meetings primarily spent on narrowing the list of recommendations and providing more detail. These recommendations represent the best efforts of the Task Force, given the short timeline to produce a work product. Ideas that were not recommended by the Task Force – due to a lack of time to refine the concept, a lack of agreement, or other reasons – have been captured in the working documents and materials of the Task Force, as well as in Appendix D of the report.

Co-Chairs Representative Helm and Senator Roblan elected to be non-voting members of the Task Force. A majority of the Task Force (seven members) was required to approve recommendations; however, the Task Force strove to reach consensus. As a result, votes of the Task Force are recorded in this report with the vote counts. Nothing in this report should be construed to represent the opinions of Task Force members' affiliated organizations.

Key Principles and Report Organization

In the early 1980s, professionals urged State's to adopt drought plans. These early plans were primarily focused on responding to emergencies caused by drought (Wilhite & Rhodes, 1994). By the 1990s, theories on preparing for drought began to shift from response to risk reduction and mitigation, prompting some states to adopt drought "Mitigation Plans."

Today, the literature identifies the following key components of drought preparedness: (1) data collection for monitoring, early warning, and prediction, (2) assessing risk, vulnerability, and impacts, (3) preparing and implementing response strategies, (4) building awareness, and (5) developing and carrying out mitigation actions (Wilhite, 2011; Schwab, 2013, pp. 65-66).

In discussing the challenges with drought, the Task Force underscored as a key principle the concepts in the literature that emphasize taking actions to be more resilient to drought instead of relying on emergency response. Resilience refers to the "ability to recover from or adjust easily to misfortune or change" (Merriam-Webster, n.d.). Reducing the need for drought response by undertaking actions to mitigate the risks and increase social, economic and environmental resiliency is often more effective. To the extent that the impacts of drought can be assessed and vulnerabilities identified, the State can better plan to either implement actions that eliminate or minimize the risk, or to respond effectively if the risk is realized. As a result this report and recommendations includes a wide-ranging look at what needs to be done to better prepare for and respond to drought as well as increase drought resiliency.

The recommendations provided by the Task Force on Drought Emergency Response address these key components of drought preparedness and response; therefore, this report is organized in accordance with these elements, while also taking into account the items identified in House Bill 4113 for the Task Force to address.

Background on Oregon's Drought Framework

Like most responses to emergencies, all levels of government may have a role in responding to drought. Drought is unlike other natural disasters that typically have a clear beginning and ending point (such as earthquakes, tsunamis, and floods); it is often called a slow-moving disaster, because impacts are widespread and take time to develop and accumulate over months to years (OEM & OWRD, 2016, p. 6). Like other natural disasters, Oregon's response framework is contained in two primary documents: the Drought Annex and the Oregon Natural Hazards Mitigation Plan (NHMP). In addition, Oregon's Integrated Water Resources Strategy (IWRS) identifies actions to help Oregonian's meet current and future water needs.

Drought Annex and Emergency Response

The Drought Annex, last updated in January 2016, describes the process for issuance of a drought declaration by the Governor for a particular area and outlines the various roles and responsibilities of state agencies during severe drought. Serving as the State's drought response plan, the Drought Annex is a companion document to the State of Oregon's Emergency Operations Plan. While it provides an overview of potential sectors affected by drought, the Annex does not identify specific areas that are likely to have challenges during a drought so that state resources can be targeted (OEM & OWRD, 2016).

More information on the process and tools for drought declarations are provided in the Preparedness, Response and Mitigation section of this document, as well as in Appendix A.

Oregon's Natural Hazards Mitigation Plan

The Disaster Mitigation Act of 2000, as amended, requires states and local governments to update their multi-hazard mitigation plans every 5 years to maintain eligibility for certain federal disaster assistance grants. Oregon's NHMP was last updated in 2015. The State Interagency Hazard Mitigation Team (IHMT), which maintains the plan, was instituted as a permanent body in 1997 under the direction of Governor Kitzhaber. The team is chaired by the State Hazards Mitigation Officer. Updates to the NHMP are managed by the Department of Land Conservation and Development (DLCD), working with the IHMT. OWRD is the lead agency for developing and updating the drought sections of the plan and has a number of responsibilities related to implementation of actions.

The mission of the plan is to create a disaster resilient Oregon. The plan seeks to conduct a risk assessment for all hazards by: (1) characterizing the hazard – both past events and future probability, and (2) assessing vulnerabilities and risks, including who is likely to be most impacted and what communities and sectors are likely to be most affected, and (3) analyzing the impacts or harm that may result. The risk assessment is intended to lead to a better understanding of the hazard and where mitigation actions should be directed. Mitigation actions are steps that can be taken to reduce the potential losses or impacts from future hazards. The Oregon NHMP outlines actions that need to be taken to make Oregon more resilient to drought; however, there are not sufficient resources to carry out all recommended actions at this time (State of Oregon, 2015).

Excerpts of several of the mitigation actions from the NHMP are included in Appendix B.

Oregon's Integrated Water Resources Strategy

Oregon's Integrated Water Resources Strategy goes beyond drought; outlining actions to help the State improve understanding of our water resources and meet current and future instream and out-of-stream needs. For example, the IWRS includes recommendations on the need for more groundwater and surface water data to support water management and water right permitting decisions. The IWRS also includes recommended actions to assist with climate adaptation and resiliency, improve water conservation and efficiency, improve access to storage, improve water measurement and reporting, encourage water reuse, and develop additional instream protections (State of Oregon, 2012).

The IWRS is required to be updated every 5 years, with the next update due in 2017. Governor Kate Brown's (2015) Executive Order 15-09 directed the Department to include drought resiliency in the 2017 Update. Some issues identified by Task Force members, particularly issues relating to longer-term actions, may be considered for inclusion in the 2017 Update to the Integrated Water Resources Strategy.

II. Data collection for monitoring, early warning, and prediction

Recommendation A: The State should continue to increase and enrich water-related data collection to inform water use decisions, conservation, and management, as well as better anticipate and respond to drought.

Context: Water management decisions are dependent on the collection, evaluation, and integration of meaningful and representative data, which becomes more important as water supplies are constrained, particularly during droughts. Prior to the onset of drought, water resources related-data are essential to forecasting supplies and water conditions, which can help water managers, businesses, agriculture, municipalities, and others, anticipate and manage demands and supplies during the year. Water-related data includes, but is not limited to, data on streamflows, groundwater, snowpack, instream flow needs, and water use. During drought, data informs the management of existing water supplies to maximize the beneficial use of water for both instream and out-of-stream needs. Over the longer-term, data is also essential to planning for future needs and changes in water demand and availability, helping to assess the reliability of supplies to build resiliency to drought.

In some parts of the state, there is inadequate streamflow, groundwater, precipitation, and snowpack data: increasing scientific monitoring data has been identified as a need in Oregon's NHMP and IWRS (State of Oregon, 2015 & 2012), as well as in the Oregon Water Resources Department's (2016) Monitoring Strategy.

To implement this recommendation:

- Agencies should continue to assess data gaps and work with local communities and partners to identify and prioritize data needs and communicate those needs to the Legislature, and where applicable, federal partners. *Vote: 11-0-2*
- Funding is necessary for data collection instruments and associated staff to collect and process the data, including additional stream gages, adding real-time telemetry to existing gages, maintaining existing gages, adding observation wells, collecting groundwater data and conducting groundwater studies, and assessing instream data needs. *Vote: 10-1-2*
- Federal data on snowpack in some basins relies on only a few data points; increased snow survey data would improve water supply forecasts. The State should advocate for federal funding to support snow surveys. *Vote: 11-0-2*

Task Force Vote*:* 11-0-2; Members also opted to vote individually on the implementation actions to further this recommendation. These votes are in italics next to each bullet above.

III. Assessing risk, vulnerability, and impacts

Recommendation B: Provide resources for assessments of drought impacts, risks, and vulnerabilities on instream and out-of-stream sectors in order to better prepare for, respond to, and recover from drought.

Context: Data on vulnerabilities and drought impacts can help to target response, mitigation and resiliency building efforts, informing components of Recommendations E, H, and I related to outreach, technical assistance, and funding (Fontaine et. al., 2015, pp. 12-13). Such actions can reduce the future severity of drought events, as well as leverage federal funding; however, the state has no systematic process in place to track impacts, or resources to complete a vulnerability risk assessment (State of Oregon, 2015, Table 3-2). Data currently gathered is limited to first-order drought impact data (i.e., number of historic drought declarations, reduced snowpack, lower reservoir levels, groundwater-level declines, reduced streamflow, reduced soil moisture, increased vegetation stress, depreciated water quality, and increased wildfire risk). This data is not sufficient for assessing risk or vulnerability; better information is needed in order to better plan for and respond to drought (Abraham, 2006; State of Oregon, 2015) across all sectors, including but not limited to: drinking water systems, agriculture, and instream uses.[3]

For example, a state-wide vulnerability assessment for public water suppliers (including small systems) would include information on water rights, contractual agreements, state and federal environmental law, at-risk species, intergovernmental agreements, entitlements (Kansas Water Office, 2007), water supplies, and un-adjudicated water rights. Such an assessment would need to identify which systems are vulnerable to low flows, potential water shortages (Abraham, 2006), and groundwater-level declines, as well as evaluate each system's adaptive capacity and response (Colorado Water Conservation Board, 2004). The information gained from the vulnerability and adaptability assessments could then be used to identify, and ultimately assist the most vulnerable systems with source, distribution and treatment capacity challenges (Abraham, 2006).

Given the complexity of these assessments, other states have secured funding for such analyses, with Colorado's Drought Mitigation and Response Plan providing one of the most comprehensive examples of how vulnerabilities and impacts can inform response and mitigation efforts (Colorado Water Conservation Board, 2010).

To implement this recommendation:

- Drought vulnerability, impact, and risk assessments should be conducted for various instream and out-of-stream sectors affected by drought. Given that assessments are a substantial undertaking, likely beyond the scope of existing resources, agencies should work with the Legislature to identify resources necessary to accomplish assessments. At a minimum, as resources allow, assessments should be conducted for agriculture, instream, and municipal water systems, taking into account the cumulative impacts of drought. These assessments should then be utilized to target resources to reduce vulnerability and increase resiliency and could inform local hazard planning and mitigation activities, as well as the statewide Natural Hazards Mitigation Plan.

Task Force Vote: 11-0-2

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[3] See footnote 1. In addition, impacts may be difficult to quantify where data is not collected annually and there is no baseline for comparison. Oregon State University Extension used to collect annual data that could be used to help characterize agricultural impacts; this data is no longer collected annually, making it difficult to assess the impacts of drought on agricultural production.

IV. Preparedness, Response and Mitigation

Recommendation C. The State should review the drought declaration process and tools to ensure drought declarations are effective to assist with emerging drought response.

Context:

Statutes Related to Emergency Response: There are two authorities that can be exercised by the Governor during a drought.

The first is a declaration "that a severe continuing drought exists, or is likely to exist" in any (or all) of the drainage basins in Oregon, activating authorities under Oregon Revised Statutes (ORS) 536.700 - 536.780. These statutes authorize coordination on water conservation activities and make available water right tools: the statutes do not provide broader authorities for statewide coordination on other actions. More specifically, the Governor or the Oregon Water Resources Commission (OWRC) can direct state agencies and political subdivisions to develop and implement a water conservation plan or water curtailment plan. In addition, a state declaration allows the Water Resources Department to provide existing water right holders with access to temporary water management tools described in Oregon Administrative Rules (OAR) 690, Division 019. See Appendix A for a list of existing drought tools that become available upon a declaration of drought under ORS 536.

In contrast, the second is a declaration of a state of emergency under ORS 401.165 to ORS 401.204, which provides the Governor with broad authorities to activate resources and direct state agencies to undertake coordination and assistance activities, including the deployment of people and equipment from any state agency deemed necessary. When requesting a declaration of emergency by the Governor, local governments must first conduct response operations to the full extent of their capability, as defined by local statutes and more fully described in emergency operations plans. As a part of that response, local governments must have exhausted all local resources including requesting assistance through mutual aid, intergovernmental agreements, and private contracts. Assistance through this process is most applicable when the severity of the drought causes or threatens widespread loss of life, injury to person or property, human suffering or financial loss (OEM & OWRD, 2016).

Process for Declaring Drought: In past years, drought declarations have been issued citing both ORS Chapter 536 and 401 authorities. An evaluation during the recent update to the Drought Annex resulted in a change to this practice, with authorities first being activated under Chapter 536, and Chapter 401 only being activated upon more severe conditions, such as a drinking water emergency.

State drought declarations have typically been done on a per county basis. There have been some exceptions; for example, in 1992 there was a statewide declaration, while in 2012 there was a declaration on a sub-basin scale in the Lost River subbasin.

Prior to receiving a drought declaration from the Governor, the county has traditionally been required to first submit a letter from the Board of Commissioners or County Court, requesting the declaration and providing supporting information as to why it is needed. Unlike Chapter 401, the drought statutes in Chapter 536 do not require the county to submit a request; however, it has been the standard practice that a county request is first required to activate drought authorities under Chapter 536.

The difficulty of defining drought is well documented. According to Oregon's Drought Annex:

> *Droughts can generally be characterized by an increased demand or decreased supply of water. In the early 1980s, researchers with the National Drought Mitigation Center (NDMC) and the National Center for Atmospheric Research located more than 150 published definitions of drought. In order to simplify analysis, the NDMC now provides four different ways in which drought can be defined:*
>
> - *Meteorological - a measure of departure of precipitation from normal. Due to climatic differences, what might be considered drought in one location of the state may not be the same in another location.*
> - *Agricultural - refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop.*
> - *Hydrological - occurs when surface and subsurface water supplies are below normal.*
> - *Socioeconomic - refers to the situation that occurs when physical water shortages begin to affect people* (OEM & OWRD, 2016, p. 7).

Due to the challenges associated with defining drought, the Drought Readiness Council reviews the information provided by the county and data about conditions from the Water Supply Availability Committee to ensure that a declaration is warranted. In addition to hydrologic and meteorological indicators, the Drought Readiness Council also considers impacts on the ground that may require a response. The county's ability to describe impacts is an important factor in the Council's decision. As a result, it is important to note that a drought declaration makes State drought tools available; however, there are likely to be areas of the state experiencing drought conditions that do not request or receive State-level assistance. The Drought Readiness Council provides recommendations to the Governor's Office; ultimately, it is up to the Governor to decide whether to issue a drought declaration (OEM & OWRD, 2016, pp. 10-11).

To implement this recommendation: In reviewing the drought declarations process and tools, the Department and its partners should consider:

- The Drought Readiness Council and the Water Supply Availability Committee should continue to meet and coordinate on drought preparedness, response tools, and data – regardless of drought conditions. To the extent possible, the Drought Readiness Council should include local entities and stakeholders, especially during times of drought, to represent the full spectrum of instream and out-of-stream interests potentially affected by drought.
- Provide more information to help the public, elected officials, and others to understand when an area is likely to experience drought, and what a drought declaration means.
- The timing of drought declarations should be reviewed, as late declarations make it difficult to utilize drought tools and plan for drought. Efforts should be on identifying drought as early in the year as possible. Addressing timing may help both out-of-stream and instream needs. Consider a pre-drought warning or advisory to draw attention early in the season, or declaring drought earlier in the year. Look at opportunities to improve coordination with local jurisdictions, so that they are aware of these pre-drought conditions.
- There is no requirement in ORS Chapter 536 that the process involve a county request or occur on a county scale. Some members observed that there may be pros and cons to the current county approach. Factors to consider include:
    - Not all sectors or entities within a county are impacted by drought in the same way: only one sector or one entity (such as a district or municipality) may require assistance or be short on supplies.
    - Utilizing only scientific indicators and indices to trigger a drought declaration versus requiring a county request. The current approach allows for local input into the decisions and

accounting for the local and regional conditions, but not all sectors may receive consideration, such as impacts on fish and wildlife, agriculture, and municipalities.

- The Department should review the drought tools and consider: (1) instituting tracking mechanisms for less frequently used tools, (2) evaluating use of temporary drought transfers and emergency drought permits – most uses occur in only a few counties, (3) identifying impacts of the use of tools and balancing the short-term need with longer-term impacts, (4) improving awareness of those less commonly used and how they work, and (5) interaction with Department's regular water management tools.

Task Force Vote: 10-0-3

Recommendation D: The Legislature should look at establishing a drought emergency fund for instream and out-of-stream needs.

Context: During drought, OWRD and other state agencies generally do not have financial assistance available for addressing drought impacts. This means that the primary response is generally limited to communication and outreach, as well as processing water right transfers and drought permits.

During the 2015 drought, a smaller water system contacted the Department about the need for a pump for their backup well, while another noted the need to extend their intake due to low streamflows. Drought may exacerbate existing water system challenges, particularly smaller systems that have less capacity to anticipate or respond to issues that arise during drought. In addition, the Department does not have funding to provide financial incentives to lease water instream in high priority areas for species conservation, which can make instream leasing a challenge.

Some states have provided funding to address emergencies related to drought; California, Washington and Montana have funding programs for drought response activities. California has invested billions of dollars into drought response and has a number of different programs (California Legislative Analyst Office 2016).

In 2015, Washington set aside $16 million for drought response. A portion of the funding was disbursed through the Washington Drought Emergency Fund, administered by the Department of Ecology. The Fund requires a 50 percent funding match and provides assistance to public bodies for projects that alleviate drought conditions on fish and wildlife, agriculture, or public drinking water systems. Public drinking water projects are exempt from the match fund requirement if they meet certain population and income standards (Washington Department of Ecology, 2015).

Montana has authority to provide funding for "emergency situations such as municipal water supply development and supplementing critical stream flows to avert the collapse of fisheries" during drought conditions through the Renewable Resource Grant and Loan Program Emergency Fund (State of Montana, 1995, p. 30). Similarly, the Environmental Contingency Account can be utilized for "emergency projects to solve immediate water related problems faced by state and local government… that, if delayed until legislative approval can be obtained, will cause substantial damage or legal liability to the project sponsor" (p.57).

Existing vehicles for addressing instream or out-of-stream needs, such as OWRD's Water Projects Grants and Loans program or Oregon Watershed Enhancement Board's Water Acquisition program typically require long-term planning and are not setup to provide emergency funding.

To implement this recommendation:

- The Oregon Legislature should consider establishing an emergency fund for drought response activities to: (1) address the unexpected issues that arise for drinking water systems, particularly small systems, (2) incentivize actions to address instream needs, particularly in high priority streams for sensitive, threatened or endangered fish, and (3) address emergency water for agriculture.
- In developing a fund, the Legislature should look to programs in other states, as outlined above and implement lessons learned from each state. These states have funding for both instream and out-of-stream purposes.
- Prior to establishing a new fund, Oregon Office of Emergency Management's (OEM) Local Disaster Assistance Grant and Loan program is an existing fund that should be reviewed to

determine if it meets the response goals during drought for both instream and out-of-stream needs. In addition, a barrier to using this fund is that it has not been capitalized. Eligible applicants are local governments.[4]

- Other programs may limit funding eligibility to local governments; however, other entities may need to be eligible if the fund is to address all sectors' needs.

Task Force Vote: 11-0-2

[4] Oregon Office of Emergency Management's Disaster Response Fund (ORS 401.534) is established for the purposes of receiving federal funding for disaster response; however, federal funding has not typically been issued to the state for drought response upon a federal declaration.

Recommendation E: Provide OWRD with staff resources to do outreach and communication. Develop communication tool box to educate all sectors and elected officials about existing tools, water conservation, drought conditions and preparedness, and help small communities respond to drought.

Context: OWRD currently lacks dedicated outreach or communications staff, leaving all communications to occur ad-hoc and as staff time allows. The 2015 drought highlighted the need for OWRD to be more involved in outreach and education about water issues. Given that communications and outreach are a significant part of drought response (Wilhite, 2011), policy staff were pulled off other responsibilities to assist; however, the lack of communications infrastructure and staff to focus on outreach remained evident. Despite being the lead agency on drought response, OWRD did not have a social media presence to participate in the statewide #ORdrought social media campaign, or the resources to engage in broader messaging on water conservation. This hampered the state's ability to encourage water conservation statewide, provide information on the Department's drought tools, or help communities anticipate the severity of conditions.

Longer-term, the Department's lack of staff to conduct outreach hampers the State from achieving water management goals, encouraging water conservation, supporting small water systems, informing water users of water management tools, addressing the emergency needs of all sectors (instream and out-of-stream, including groundwater and surface water uses), and effectively assisting Oregonians in becoming more resilient to drought. OWRD's limited resources to do outreach also likely results in a lack of awareness on water issues and underutilization of OWRD's instream leasing, conserved water, groundwater recharge, and funding programs. In addition, this hampers the State's ability to educate users on best management practices and water use efficiency, including beneficial use without waste.

Several Task Force members with experience encouraging utility customers to conserve water noted that messaging must be done regularly to inspire voluntary public participation and build a culture of conservation. When done consistently, public outreach and education have proven effective in realizing voluntary water conservation. In Oregon, some water providers have been able to reduce water use during drought through increased outreach and education. For example, the City of Ashland was able to meet their water reduction goal of 30 percent voluntarily during two consecutive drought years by providing the community with tangible efficiency measures, tools and incentives. Similarly, water providers in the Regional Water Providers Consortium have been able to pool resources to develop coordinated water conservation messaging. Unfortunately, without a State-led effort, smaller water providers often lack the resources to encourage water conservation.

California has been a leader in public outreach, investing millions of dollars into its "Save our Water" campaign, which has the goal of helping Californian's make lasting changes to reduce water use (California Legislative Analyst Office, 2016, p. 16). The campaign has a strong online and social media presence, among other outreach strategies. The effort also includes tools and outreach materials that can be utilized by partners, such as small water providers that have limited resources to develop their own water conservation campaigns.[5]

Helping Oregonians understand their water resources challenges and needs is identified as a key component in the State's Integrated Water Resources Strategy (State of Oregon, 2012). In addition, the NHMP calls for conducting public information and education programs aimed at mitigating the damage caused by natural

[5] For example, see www.saveourwater.com.

hazards (State of Oregon, 2015). Enhancing OWRD's staff resources is essential to increasing OWRD's ability to coordinate statewide outreach and education, promote conservation, and highlight existing water management programs.

To implement this recommendation:

- Provide OWRD with staff resources to do outreach and communication; this may also require IT and GIS support. Staff should work on increasing awareness of OWRD's existing programs, as low uses of programs may be from lack of outreach. This would include regular water management tools (e.g., transfers, instream leasing, allocation of conserved water, groundwater recharge, etc.), as well as drought response tools outlined in Appendix A (e.g., temporary drought transfers, emergency drought permits, special option agreements, temporary substitutions, temporary exchanges of water, and preferences for human consumption or stock water use).
- As resources allow, OWRD should develop a communication tool box to educate all sectors and elected officials about existing instream and out-of-stream tools, water conservation, and drought conditions and preparedness, and to help small communities to respond to drought. A toolkit would minimize the expense and time required to develop messaging and make it easier for smaller systems to assess risk, implement best practices, and communicate with their customer base about water conservation. See Appendix C for more information on what needs to be developed for effective outreach.
- In order to leverage limited resources, OWRD should explore partnerships with third parties such as larger utilities, universities, industry groups, and other organizations to share outreach materials and coordinate outreach and education efforts.

Task Force Vote*:* 10-0-3

Recommendation F: The Legislature should look at establishing a fund for drought planning to help communities be better prepared and more resilient to drought.

Context: Drought planning has been identified by academics and governmental entities as an essential tool in preparing for and anticipating drought conditions (Wilhite, 1991). "According to the Federal Emergency Management Agency (FEMA), taking steps ahead of time to prevent or lessen known impacts from a natural disaster saved $4 for every $1 expended" (as cited in U.S. Bureau of Reclamation, 2015). Community drought planning efforts are limited by a lack of incentives, funding, and technical support.

OWRD funding programs are intended for broader integrated planning, feasibility studies, and implementation of projects that address long term water resiliency. The Water Resources Department's current programs cannot fund the various planning activities that may increase drought preparedness and resiliency: Water Management and Conservation Plans (WMCP), curtailment plans, conservation plans, drought contingency plans, or drought components of local hazard mitigation plans. Some of these plans may be costly to develop, but could help communities be better prepared for and more resilient to drought.

Oregon's NHMP identifies the need to support development and updating of local and state hazard mitigation plans. Having plans in place can help position entities to receive federal funding for implementing mitigation projects. Oregon (generally DLCD) applies for FEMA pre-disaster mitigation grant funds when they become available and for post-disaster mitigation grant funds after a Presidential disaster declaration; however, these funds support mitigation planning to varying degrees and require a 25 percent non-federal cost-share. Furthermore, drought is just one of several natural hazards that may be addressed by NHMPs. DLCD received funding to support the recent State NHMP update and to help update local plans. DLCD provides some funding for natural hazards mitigation planning to local governments through its Technical Assistance Grants Program; however, the budget for this program has been reduced in recent years and there continues to be a significant funding shortfall to help develop natural hazard mitigation plans and keep them current.

Leveraging federal drought funding is dependent on an entity being prepared so it can respond quickly when a grant opportunity is announced. Many aide programs, such as FEMA's mitigation program and the Bureau of Reclamation's WaterSMART programs, require a minimum cost-share portion from non-federal participants, which can be a significant sum of money to procure under a short application deadline. Without dedicated cost-share funding sources secured prior to a grant proposal request announcement, there is risk of leaving money on the table if awarded the grant, a scenario which Santiam Water Control District found themselves in during 2015 when applying for a WaterSMART grant to develop a Drought Contingency Plan (Stevenson, 2016).

To implement this recommendation:

- The Legislature should approve expenditure limitation of federal funds and provide state match funds to assist with development of local and state hazard mitigation plans. Local hazard mitigation plans should take into account drought, as all of the state can be susceptible to drought.
- The Legislature should also consider establishing a fund that can be used to assist with other planning efforts, which could include: (1) match funds to leverage federal WaterSMART Drought Contingency Planning Grants, (2) funds to assist small water systems in developing a water management and conservation plan, curtailment plan, or conservation plan, or further refining their Emergency Response Plan required by Oregon Health Authority, and (3) funding to incentivize irrigation districts and others to develop water management and conservation plans.

Task Force Vote: 10-0-3

Recommendation G: Provide funding for additional watermaster staff and tools to make water distribution more efficient.

Context: Watermaster staff are the most important educators for water users and an essential resource during drought. Watermasters and assistant watermasters cannot perform all of the demands required of them, which is only heightened during drought years. The severe drought in 2015 sharply increased watermaster workloads across the state, exacerbating already existing workload challenges.

Regulation is a challenge in part because of the often vast distances between points of diversion (PODs), the sheer number of PODs, and the fact that diversions and streams are not a series of pipes and valves. While telemetry on stream gages can help watermasters track streamflow conditions, field measurements to verify the data are still necessary and are not a substitute for field staff. Furthermore, a large portion of the job is managing disputes between neighbors and meeting with water users to help them understand their water rights and water law; there is no technological solution for these situations.

Examples of ongoing workload challenges include: delays in responding to calls for regulation, delays in responding to changes in the hydrology that allow junior users to turn back on, excessive overtime, increased calls from individuals looking for alternate water supplies, insufficient visibility of field presence to discourage or identify illegal use, the need to collect data and measurements for regulation, and increased calls and complaints related to marijuana. Watermaster workloads are also increasing due to increases in the number and complexity of water rights, the addition of new wells, and population growth.

Each region has its own set of workload challenges that need to be addressed in order to best serve Oregonians. Basin specific field knowledge is required to perform the duties of a watermaster, which makes it difficult to hire and adequately train temporary field staff to assist only during busy times of the year or drought.

To implement this recommendation:

- OWRD should identify tools that would make water distribution more efficient. For example, developing tools through the use of information technology can help some field offices, but requires investments in technology staff. Investments in telemetry and stream gages can also help staff with water distribution; however, technical staff to maintain the stations and process the data have not kept up with needs and, therefore, new gaging stations and technology may increase watermaster workloads.
- The Legislature should provide funding for additional watermaster staff and, as identified, provide funding to implement tools to make water distribution more efficient.

Task Force Vote: 10-0-3

Recommendation H: Need to address lack of planning, support, resources, and technical assistance for small water systems to be better prepared for drought.

Context: Most of the water systems in Oregon are small and serve less than 500 people. Small and large systems have similar regulatory and operational requirements, but there is a large disparity in available resources, including funding, staffing, and regulatory compliance. Water systems with a small rate base often have insufficient funds to make repairs or develop system infrastructure, and may be too small to qualify for funding assistance. Additionally, there is often pressure to keep rates low, as water board officials or city councilors are often recalled or not re-elected after authorizing a rate increase. Staff are frequently part-time or voluntary and have to perform all duties from maintenance to budget and customer service; as a result, there is high turn-over and limited training. The lack of resources often means that staff are focused on immediate problems such as regulatory compliance, ongoing water supply issues, and meeting minimum testing requirements, with little to no capacity to plan for drought or implement actions to become more resilient to drought. Drought tends to exacerbate existing challenges in these systems' water supplies, leading them to often be the most vulnerable.

Water Management and Conservation Plans are a tool for water systems to document and understand their the water delivery system and water demands, identify the sources of water, and explain how the entity will manage and conserve those supplies to meet present and future needs, including during times of unexpected supply deficiencies such as drought. Unfortunately, the requirements for existing Water Management and Conservation Plans (WMCP) can be cost prohibitive and beyond the capacity for small water systems to develop. Similarly, in developing Emergency Response Plans as part of Oregon Health Authority's (OHA) requirements, the Task Force heard testimony that these may be inadequate. Additional assistance for small water providers to prepare for drought should build on existing OHA and OWRD requirements and avoid being overly prescriptive to ensure flexibility and avoid increasing the burden to small water providers.

To implement this recommendation:

- OWRD should develop a voluntary WMCP lite template as a tool for small communities to understand their water rights, drought risk, and approaches for conservation, and curtailment. Such effort should be coordinated with OHA's Drinking Water Program to ensure consistency and prevent duplication of Water System Master Plan Requirements or Emergency Response Plan Requirements.
- With over 3,400 public water systems, OWRD and OHA have limited capacity to provide technical assistance and outreach. Resources are needed to provide technical and planning assistance to small communities, develop training materials, and work with third parties such as Rural Community Assistance Corporation and the Oregon Association of Water Utilities.
- To the extent that resources allow, OWRD and OHA should coordinate with Rural Community Assistance Corporation, Oregon Association of Water Utilities, and other partners to provide training and technical assistance to small water systems and help them better prepare for drought.
- To the extent that resources allow, OWRD and OHA's Drinking Water Program, in cooperation with OEM, other applicable state agencies, local governments and water providers, should work to identify and implement actions to improve coordination on matters related to drinking water supply shortages.

Task Force Vote: 10-0-3

Recommendation I: Assemble a group of experts to evaluate and identify existing infrastructure programs and evaluate barriers to accessing infrastructure funding. Provide technical assistance or capacity building grants to help individuals and communities identify, apply for, and access infrastructure funding to improve drought resiliency.

Context: Funding for projects that increase diversity of water sources and promote resiliency during drought and other extreme events can be a challenge for some entities to obtain. Infrastructure improvements can help water users responsibly manage available water and mitigate drought impacts. Infrastructure needs include updating and upgrading aging pipes with high leak rates, but it also includes promoting resiliency projects such as interties between water providers allowing for diversification of water sources.

Infrastructure funding is important for drought resiliency and sustainability; however, the backlog of infrastructure needs, especially for small water providers, is still enormous. Currently water providers have an assortment of options (Drinking Water State Revolving Loan Fund, Special Public Works Fund, Water Supply Development Account, and federal programs, etc.) for financing infrastructure improvements, addressing aging infrastructure, and eliminating water loss from leaks. For a variety of reasons, some funding pools have been underutilized, and it can be a challenge to identify appropriate funding sources and understand the different requirements. In addition, small water systems and individuals may face challenges accessing these programs, not having the resources or expertise to identify appropriate funding sources and develop competitive applications.

To implement this recommendation:

- The Governor or Legislature should assemble a group of experts to identify existing infrastructure funding programs, outline their requirements, and evaluate potential barriers to accessing infrastructure funding. *Vote: 10-0-3*
- To improve individuals and communities' ability to access infrastructure funding sources, the State could either hire technical assistance staff with knowledge of various funding sources, or could create a capacity grants program to allow communities to hire experts. Such a program could be particularly helpful to assist small communities. *Vote: 7-3-3*

Task Force Vote*:* Since the larger recommendation essentially duplicates the bullets, no vote was taken on the larger recommended action. Members opted to vote individually on the implementation actions to further this recommendation. These votes are in italics next to each bullet above.

Recommendation J: Evaluate management options for stored water to better address current and future instream and out-of-stream needs.

Context: The management of existing stored water in Federal and non-federal reservoirs may not be responsive to current or future water needs under various climate scenarios. There may be a need for modified flood control/spill procedures for reservoirs, particularly during times of drought. As the state faces water shortages, there may be an opportunity to modify management practices to ensure that communities are still protected from flood events, while providing more water later in the season for farms, communities, fish, and recreation. Identifying options and trade-offs for changing water storage and releases may benefit consumptive and in-stream needs. The State should be at the table in informing the management of federal reservoirs or any proposed changes to operations of those reservoirs.

In regards to federal projects, in recent years there has been discussion about modifying federal operations – typically, the U.S. Army Corps of Engineers (Corps) projects – to maximize storage capacity during low water conditions. The Corps operates dams in accordance with a water control diagram that "reflects the anticipated uses of water and the Corps' legal responsibilities and limitations…The water control diagram includes a flood damage reduction rule curve to manage the dam for a 100-year storm event...The rule curve shows the maximum elevation to which the Corps can fill a reservoir during various times during the year, with the exception of real-time flood operations" (U.S. Army Corps of Engineers, 2011). While changing rule curves to modify federal reservoirs is often suggested as a solution to some water management challenges, it can be a significant undertaking involving a process that is not well understood by most stakeholders.

To implement this recommendation:

- Evaluate current state rules and statutes related to reservoir management to determine if the state has flexibility to change spill/fill procedures.
- There is a need for better understanding by stakeholders of what rule curves are and what is needed to change a rule curve so the State can better represent its interests.

Task Force Vote*: 10-0-3*

Recommendation K: The Legislature should look at measures and incentives to promote water conservation and efficiency.

Context: Measures that reduce water use while maintaining the benefits water provides have been shown to be cost effective and flexible tools to adapt to drought as well as to address longstanding water challenges (Pacific Institute and Natural Resources Defense Council, 2014). Tax incentives and rebate programs for water conservation measures have included storm water management projects (Rainwater and Water Conservation Incentives, n.d.), installation of rain water collection or grey water systems (Arizona Department of Revenue, 2011), low flow toilet upgrades (U.S. Environmental Protection Agency, 2016), and lawn replacement programs (Save Our Water, n.d.), offered at the local or state level.

Unlike rebates for energy efficiency improvement measures, water conservation rebates are subject to both state and federal income tax (Alliance for Water Efficiency, 2015). There are several movements underway to exclude water conservation rebates from gross income including the introduction of H.R. 4615, the Water Conservation Rebate Tax Parity Act, that would amend the Internal Revenue Code; some states are also changing state tax law to provide the same incentives for water conservation measures as energy efficiency measures.[6]

Oregon does not have incentives to promote water conservation. Ensuring that there are no unintended consequences to participating in water conservation incentive programs may encourage greater participation in these programs, while increasing community resiliency to drought.

To implement this recommendation:

- The Legislature should look at providing tax incentives for water conservation and efficiency measures.
- The Legislature should look at making water rebates nontaxable income.

Task Force Vote: 9-1-3

[6] For example, California passed A.B. 2434 in 2014, excluding from gross income incentives for turf removal.

Recommendation L: The Legislature should consider additional programs to facilitate restoration of streamflows through voluntary means during times of drought.

Context: Oregon's instream leasing and transfer program provides a voluntary means to aid the restoration and protection of streamflows. This arrangement provides benefits both to water right holders and to instream values by providing water users with options that protect their water rights while providing water for instream benefits. Water users who are at risk of forfeiture of their water rights due to non-use may find instream leases to be a good management option. During drought years, many streams experience extremely low flows prior to a formal drought declaration.

Over the years, there have been efforts to implement actions that make it easier to participate in streamflow restoration programs. For example, OWRD has improved processing time of instream lease applications from an average of 90 days to 45 days and split-season leasing has been authorized by the Legislature. However, there is still an interest in providing more flexibility to water users, making it easier to put water instream, and shortening timelines for approval particularly during the early part of the season.

Colorado, for example, allows a "loan" of water instream, which only requires a single approval by the state engineer. In this instance, the arrangement can be approved for up to a ten-year period, with the exercise of the water for instream purposes allowed to occur for up to three years within that ten year period (C.R.S. § 37-83-105). This provides some flexibility by having the option to exercise the right instream during times when it is needed most, while reducing the need to submit additional applications and fees each year the water is put instream. Oregon has a somewhat similar arrangement that can be used only in drought years; however, its use has been minimal.

According to a report comparing different state's authorities related to instream water right transactions, two other states have allowed another type of tool, where an instream use can be added to a water right, along with other out-of-stream uses, so that the water user can allocate water between uses each year without formal re-approval of the transfer (Szeptycki, et. al., 2015).

To implement this recommendation:

- The Legislature should look at establishing a program that would allow for the pre-approval of leases for instream purposes. A pre-approval process, with appropriate sideboards, could improve water right flexibility by allowing a water right holder to submit an application to lease their water instream for up to 5 years and notify OWRD immediately prior to each irrigation season if they desire their water to remain instream, without having to go back through the application process. The water right holder could use their water out-of-stream per their water right during all other years. The lease application would still be subject to the injury and enlargement review, additionally, failure to notify OWRD of the desire to keep the water right instream would count towards non-use, minimizing opportunities for misuse and ensuring that the forfeiture statute is not circumvented. This change would allow water right holders to respond to and mitigate for the impacts of drought conditions with a low financial and administrative burden to the water right holder. *Vote: 7-4-2*

Task Force Vote: 9-2-2; Members also opted to vote individually on the implementation action to further this recommendation. These votes are in italics next to the bullet above in the section on how to implement this recommendation.

Recommendation M: Oregon should continue to encourage water reuse activities throughout the state, while giving due consideration to the protection of instream flow, water quality, public health, and drinking water sources.

Context: Water reuse can result in more water being available for other instream and out-of-stream uses; as a result it is a tool to augment supply, which can increase resiliency to drought. As discussed in the 2012 Integrated Water Resources Strategy:

> *Oregon should continue to encourage water reuse activities throughout the state. This can be done, in part, by conducting a statewide assessment of the potential for additional water reuse, matching the water quality of reclaimed water to appropriate end uses. Such an assessment could determine the potential for water reuse to fulfill current and future water needs, while taking into consideration potential impacts on streamflow and water quality.*
>
> *Water reuse could also be advanced by ensuring that Oregon has the right policies and regulations in place to facilitate water reuse, giving due consideration to the protection of instream flow, water quality, public health, and drinking water sources. Oregon should also consider providing financial or technical incentives for increased water reuse for municipal, industrial, and agricultural uses.* (State of Oregon, 2012, p. 94).

To implement this recommendation:

- This action affirms IWRS Recommended Action 10C – Encourage Additional Water Reuse.

Task Force Vote: 8-1-3 and 1 abstaining.

V. Appendices

Appendix A. Overview of Tools

Overview of Drought Specific Tools

Emergency Water Use Permits

An approved emergency water use drought permit allows a water user to temporarily replace water not available under an existing water right. The most common drought permit allows the use of groundwater as an alternative to an existing surface water right. A well-prepared application generally takes approximately ten business days to process. Emergency water use permits are issued through an expedited process and are valid for one year or the term of the drought declaration, whichever is shorter.

Temporary Transfer

A water user can apply to change the type of use, place of use, or the location of the diversion under an existing water right. A temporary drought transfer takes place under an expedited process, and is in effect for the duration of the drought declaration or up to one year, whichever is shorter.

Temporary Instream Lease

Once approved, a water user can convert all or a portion of a water right to an instream use for a period of one year or the term of the drought declaration, whichever is shorter.

Temporary Substitution

Any person holding both a primary right originating from a surface water source and a supplemental right from a groundwater source may apply to temporarily use the supplemental right instead.

Special Option Agreements

A water-right holder can enter into an agreement that authorizes the use of water at locations, from points of diversion, and for uses other than those described in the water right. Typically, the agreement remains in place until terminated by the parties, and provides additional water-supply options in times of drought.

Temporary Exchange of Water

The Water Resources Commission can approve a temporary exchange of existing rights, such as using stored-water instead of a direct-flow surface-water right.

Human Consumption or Stock Water Use Preference

The Water Resources Commission has authority to grant a temporary preference to water rights for human consumption and/or stock watering uses. The preference is given over other uses regardless of the priority date (seniority) of water rights associated with the other uses. In order for the preference to go into effect, the Water Resources Commission must approve temporary rules instituting the preference.

Requiring Development and Implementation of Curtailment or Conservation Plans

ORS 536.780 allows the Water Resource Commission, "upon a finding that a severe or continuing drought is likely to occur," to direct individual state agencies and political subdivisions (e.g., a county, city, town, or district) to prepare "a water conservation or curtailment plan or both" (OWRD, 2015b, p. 86). Some entities have already developed curtailment plans as part of their Water Management and Conservation Plans, which are discussed in more detail below.

Other Tools Highlighted by Members and Discussed – Not Specific to Drought:

Water Management and Conservation Plans

Many municipal and domestic water suppliers, irrigation districts, and other agricultural water suppliers are required to prepare Water Management and Conservation Plans (WMCP) to meet their water right obligations; such as, water right permit conditions, long-term permit extension request, or to participate in a water right transfer under OAR 690-385. A WMCP describes the water delivery system and its water demands, identifies the sources of water, and explains how the entity will manage and conserve those supplies to meet present and future needs. A WMCP also includes a curtailment element, which can be used to meet the requirement for a curtailment plan by the Commission during a drought declaration (OWRD, 2015b, p. 85).

Pursuant to OAR 690-86, water curtailment plans are required to have the following:

- A description of water supply deficiencies experienced within the past 10 years;
- An assessment of current capacity limitation(s) and the ability to maintain water delivery during long term supply shortages;
- At least three stages of alert;
- Pre-determined situations which trigger each stage of alert; and
- A list of curtailment actions to be enacted under each stage of alert.

Oregon Administrative Rules 690-410-060 – Water Conservation and Efficient Water Use Rules

These rules identify policies and principles related to water conservation and efficient use of water in the state. The rules establish a policy that eliminating waste and improving water use efficiency are high priorities and that programs to eliminate waste should be developed. The policy also gives priority to over-appropriated areas or areas with water quality challenges in regards to development of subbasin conservation plans and assistance. [7] A number of principles are then outlined for programs to implement the policy. These rules were adopted in 1990, but have not been fully implemented.

[7] Oregon Administrative Rules 690-410-060(1).

Appendix B. Mitigation Actions Identified in the Natural Hazards Mitigation Plan

Examples of mitigation actions in Oregon's Natural Hazard's Mitigation Plan from Table 3-1:

- 39 - Add real-time telemetry at existing gaging stations
- 77 & 105 - Develop an improved method for identifying most vulnerable communities to drought and related impacts
- 79 - Continue to refine the hazard description
- 80 - Continue to refine exposure, vulnerability, and losses
- 81 - Continue to refine priorities, and those at greatest risk
- 85 - Provide support for development and update of local and state hazard mitigation plans.
- 86 - Improve and sustain public information and education programs aimed at mitigating the damage caused by natural hazards
- 87 - Provide technical assistance and funding to local governments to evaluate the need and opportunities for inter-tie projects in Local Natural Hazards Mitigation Plans.
- 97 - Expand the state's stream gaging network. Seek stable funding for the operation, and maintenance of stream gages.
- 98 - Better coordinate, fund, and publicize programs to reduce the abundance of juniper trees in arid landscapes across Oregon.
- 105 - Implement the improved methodology for gathering data and identifying the communities most vulnerable to drought and related impacts (State of Oregon, 2015, pp. 1024-1036).

Appendix C. Potential Communications and Outreach Needs

As highlighted in Recommendation E, there is a need to increase OWRD's ability to coordinate statewide outreach and education, promote conservation, and highlight existing water management programs. This section outlines ideas for improved outreach as well as references existing resources that could be leveraged, if staff resources were made available to conduct this work. In addition to advancing Recommendation E, resources outlined here could also support actions under Recommendations H and I.

Ideas for Content to Develop and/or Share to Advance Outreach

1. **Links to water efficiency resources:** [8]
   - Water wise landscaping websites and examples, such as, the City of Ashland, Medford, Hillsboro and Bend water wise landscaping websites
   - City websites
   - Information and links to presentations on Graywater applications and Rainwater Harvesting
   - Irrigation scheduling information for different areas across the state

2. **Water Use Efficiency Videos:**
   - How to replace your old inefficient toilet, showerhead etc.
   - How to install a smart irrigation controller
   - How to convert your landscape to a drought tolerant landscape
   - How to save water on your farm or ranch
   - How to read your meter and determine how much you're losing from a leak
   - Do you know where your water comes from?[9]

3. **Graphics and Interactive web based resources:**
   - Map that you can click on for more region specific information – utilize GIS
   - Graphs showing water use by sector across the state
   - Graphs showing average water use in the home etc.
   - Illustrate the extent of drought through videos[10]

4. **Develop Fact Sheets:**
   - Improve Your Resiliency to Drought; include, a list of steps to stay ahead of the drought and develop a checklist of tools that apply
   - How to survive a drought
   - How to water your trees
   - Prioritize landscape watering; trees, shrubs & flowers, lawn
   - WaterSense labeled toilets, urinals showerheads, faucet aerators, pre-rinse spray valves for restaurants, and smart irrigation controllers
   - Clothes washers
   - Table showing water usage by appliance/plumbing fixture.[11]

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[8] For example, see Alliance for Water Efficiency - http://www.allianceforwaterefficiency.org/, Home water works - http://www.home-water-works.org/; U.S. EPA. WaterSense, https://www3.epa.gov/watersense/.

[9] For example, see North Texas Municipal Water District. (n.d.). WaterIQ. Retrieved from http://northtexaswateriq.org/campaigns/wiq..

[10] For example, see Emigrant Lake Ashland, Oregon Drought 2014, YouTube video 2:35, posted by "Rogue Aerial Production," 12 Oct. 2014, https://www.youtube.com/watch?v=JlurSQinUXg.

- How to use the Water Demand Forecast Model on the OWRD website
- Information on water rights, beneficial use, and existing water right programs to increase users and the public's awareness.
- Information on best practices to improve water use efficiency

5. **Resource Reference Lists:**
   - List of all available water rebates across the state by city
   - Information on agriculture resources and financial incentive programs
   - Provide irrigation scheduling information for different areas across the state
   - Provide links to organizations that do onsite water assessments – agriculture & farms

6. **Stewardship and Conservation Awards**
   - The Water Resources Commission could recognize entities for their water conservation efforts

7. **Social Media**
   - Develop social media presence on applicable platforms; Facebook, Instagram, Twitter, Pinterest, Periscope, etc.
   - Lead the #ORdrought campaign in years of drought.

8. **Workshops and Training:**
   - Promote existing conservation tools available to water users, including; groundwater recharge, transfers, instream leases, allocation of conserved water, drought tools, funding programs, etc.
   - Drought preparedness[12]
   - Promote water use efficiency measures and programs, such as the EPA WaterSense program.

9. **Traditional Media**
   - Utilize traditional media outlets to increase the public's understanding of the resource, promote water use efficiency, and build a culture of conservation, including but not limited to: billboards, radio, TV, and print ads.

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[11] The City of Ashland has developed a table showing water usage by appliance/plumbing fixture. Available at: http://www.ashland.or.us/SIB/files/Indoor%20Water%20Use%20Evaluation%20Guide%204_5_13.pdf.

[12] For example, the EPA has developed a check list of steps that water users could take to prepare for drought. Available at: https://www.epa.gov/sites/production/files/2015-06/documents/drought_0.pdf.

Resources and Ideas for Developing a Tool Kit for Small Water Providers

A tool kit for small water providers could assist utilities with limited capacity to initiate conservation programs and drought planning. A tool kit could address the following topics as outlined below, helping further many of the recommended actions in the report.[13]

1. **Model Water Management/Curtailment Plans -** Having a developed curtailment plan is an essential part of being prepared to respond to water shortages in a timely manner. This tool could provide an overview of curtailment development, reference resources and tools, and provide examples of plans from around the state with the goal of helping providers develop a curtailment plan quickly with minimal cost.[14]

2. **Water Loss and Supply Alternatives** - The savings potential inherent to implementing a water loss control program can be more than the savings achieved through other programs combined. These losses represent water that the provider has already paid to obtain, store, treat and distribute. A water loss control program can include leak detection, pressure management, and improved speed and quality of leak repair.[15]

3. **Customer Programs and Communication -** Information could be provided about popular and effective water efficiency and conservation programs, and communication and outreach strategies that have been used by water utilities to educate customers and influence water use behaviors. The City of Ashland and Regional Water Provider's Consortium could be highlighted.[16] Potential Resources to develop could include:

    - An index of water efficiency programs
    - Strategies for how water providers can communicate with; 1) their customers, 2) the media
    - References linking examples of effective water efficiency programs and communication strategies
    - Water conservation outreach templates, i.e. leak detection, outdoor water conservation, indoor water conservation

4. **Water Supply Fact Sheets -** A challenge that water providers face is communicating the value of water to their customer base. To better understand water shortages and the need to reduce use, customers first need to understand their water source, the steps needed to make it safe and reliable, and the limits of the supply. Outreach materials can help providers explain their supply and delivery system with clear, well-

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[13] For example, see: California Urban Water Conservation Council: Water Shortage Toolkit. Available at: http://www.cuwcc.org/Resources/Drought-Resources/tool-kit. See also: U. S. Environmental Protection Agency. March 2016. and EPA's Drought Response and Recovery- A Basic Guide for Water Utilities. Available at: https://www.epa.gov/sites/production/files/2016-03/documents/epa_drought_response_and_recovery_guide.pdf.

[14] For example, see supra: EPA's Drought Response and Recovery for Water Utilities - Worksheet 2: Update or develop a Drought Response Plan

[15] For example, see supra: EPA's Drought Response and Recovery for Water Utilities - Worksheet 6: Water Supply and Demand Management

[16] Examples include: (1) Water Conservation Measure Analysis Model - A high level resource to analyze conservation opportunities for the water providers. The model is simple Excel-based tool that estimates water savings and costs for various pre-loaded conservation measures based on specific information about the municipality. This may help utilities determine what conservation measures might be most cost-effective to implement. This has been used in California and by the City of Bend. (2) OWRD's Water Conservation webpage. (3) EPA Drought Response and Recovery for Water Utilities - Worksheet 5 System Efficiency, Water Demand and Customer Use. (4) City of Bend Oregon. 2011. Water Management Conservation Plan, www.bend.or.us/modules/showdocument.aspx?documentid=5972.

illustrated messages. Some materials can be made available as downloadable templates that water providers can customize to their own service areas, which could save costs and time for small utilities with limited funds and staffing. Potential Resources to develop could include:

- Fact sheets
- Newsletter articles
- Water Supply Bill Inserts
- Public Service Announcements

5. **Resources and Funding -** Providers need help seek and apply for water agency funding. These materials could provide a basic action plan for procuring needed funds, a list of common funding sources that can be used as starting points to aid in the search of available funds, and additional resources to guide funding proposals. This would also provide information and outreach on existing tools such as instream leases, the allocation of conserved water program, groundwater recharge, transfers, etc. Potential Resources to develop could include:

   - Tips for starting a water efficiency program; first steps, requesting a budget, etc.
   - A cost -benefit model for implementing efficiency measures

Appendix D. Topics Proposed but No Agreement Reached

This section contains items that the Task Force thought required more discussion or needed input from other interests not at the table, as well as items that the Task Force decided not to try to reach agreement on, or could not reach agreement. These items are recorded here without recommendation by the Task Force.

- Review of state agency coordination of drought-related program efforts, including OEM, DLCD, OWRD, and Oregon Department of Fish and Wildlife (ODFW).
- Fund drought response and mitigation staff.
- Review of existing provisions regarding allocation of conserved water program including: a) utilization of conservation program; (b) identification of any impediments to the use of the program; (c) methods to enhance program utilization or (d) statutory modifications to increase use of program.
- Fund infrastructure improvements and address aging infrastructure. Fund improvements to infrastructure to eliminate water loss from leaks. Conduct a statewide audit of existing water systems and prioritize inefficient ones for funding. Program funding could also be targeted to communities or areas identified through vulnerability assessments.
- Provide greater funding/prioritization of storage projects that address drought and/or critical water shortages. Provide incentives for innovative, off channel projects that yield economic and environmental benefits during drought. Review previous OWRD study on above and below ground storage sites; revise as needed, use list to support community level planning efforts around storage. Evaluate barriers to storage, including but not limited to regulatory and funding structures.
- Aquifer storage and recovery (ASR) projects also need to be promoted and studies made more accessible financially. ASR projects can provide a redundant supply that can be useful in emergencies and to assist in meeting peak demands.
- Develop a Pre-drought Action Plan that evaluates the consequences of each response action prior to drought occurring.
- Allow management agreements, such as forbearance agreements, to be registered with the Department and to count as "use" for the purposes of forfeiture if the intent is to put water instream.
- Create incentives for Agriculture or Irrigation Districts to complete a WMCP. Increased assistance for entities that complete a plan. Give preference for grant funding to applicants that have a WMCP in place. Develop a WMCP lite for agriculture. Provide safe harbor so that information in Ag WMCP's cannot be used in a court proceeding.
- Direct OWRD to fully implement OAR Division 410.
- Conduct more scientific studies evaluating instream flow needs with climate change, including updating stream assessments for high priority areas.
- Establish proactive emergency regulation temperature triggers for fishing closures during drought, including protective triggers for thermal refugia ODFW already has the authority to and is currently developing an internal framework to address this.
- Evaluate the American National Standard for Water Conservation and Sanitation supplemental code, developed by the International Association of Plumbing and Mechanical Officials, for possible adoption to replace green plumbing codes.
- Evaluate the role of upland forest management to increase water yield and quality. Members determined that this proposal was beyond the scope of the charge of the Task Force, but acknowledged the importance of forest management for watershed health and drinking water systems.

- Improve connection between land use and water resources.
- Promote groundwater recharge projects.
- Create a groundwater credit system that allows unused water to be banked for drought.
- Direct OWRD to enforce against waste, including regulation of wasteful use and imposing civil penalties. Fund seasonal water masters to actively enforce against waste.
- ORS 536.780 allows the Water Resource Commission, "upon a finding that a severe or continuing drought is likely to occur," to direct individual state agencies and political subdivisions to prepare "a water conservation or curtailment plan or both." ORS 536.720(2) allows the Governor, following the declaration, to order individual state agencies and political subdivisions a water conservation or curtailment plan, or both. Governor and/or WRC should utilize this authority to include, at a minimum, municipal/quasi-municipal providers and districts, as well as state agencies. Governor could present to the Commission and request that, for any such entity without a WMCP, it require these plans to be produced.
- Make full compliance with WMCP, including hitting target leak rate (10 or 15%, depending on plan and stage of plan) a prerequisite for qualifying for water project funding (e.g. 1069, etc.) unless that funding request is specifically and strictly for reducing leak rate or accomplishing other meaningful conservation.
- Similar to California's regulations, set emergency minimum flows for fish on streams of significant ecological value.
- Governor direction to OWRD/OWRC to use existing authorities to require measurement and reporting of surface water diversions, groundwater and reservoirs (i.e. including but not limited to ORS 540.310, ORS 540.330, ORS 540.435. ORS 537.665).
- Governor and/or OWRC set near term deadlines for full implementation of all three tiers of the WRC's 2000 Strategic Water Use Measurement Plan.
- Provide additional funds to the Measurement Revolving Fund.
- Waive OWRD's instream lease fees during drought in counties with declared droughts under OWRD's existing authority. Existing statutory authorities allow for this reduction in fees during a drought year. ORS 536.050(5)(a) allows but does not require OWRD to waive all or part of the fees identified for instream leasing. Rather than requiring action by the Legislature, this change could be made by requiring OWRD to waive instream leasing fees through changing Oregon's Administrative Rules.
- One member raised the issue that conservation efforts may lead to tax assessors questioning the farm use assessment tax deferral status. Proposed to eliminate potential risks to farm tax deferral associated with instream leasing by making the following changes to Oregon Revised Statutes:
  - 308A.056 Definition of "farm use." (3)(a) Farmland, the operation or use of which is subject to any farm-related government program; <u>Including instream leasing programs administered by the Oregon Water Resources Department as described in ORS 537.348(2)</u>
  - 308A.743 Disqualification limited when land subject to conservation and management plan, conservation easement, ~~or~~ deed restriction, <u>or farmland subject to farm-related government program; procedural requirements. (1) (C) enrolled the water rights appurtenant to irrigated farmland in instream leasing programs administered by the Oregon Water Resources Department as described in ORS 537.348(2).</u>
- Add instream use to a water right certificate. Under this proposal, a water right holder would submit a transfer application to OWRD. The application would specify an instream use be added to the water right and designate all or a portion of the existing place of use that would not receive water

during years when the water was used instream. The application would undergo the same review and public process requirements as any other transfer application submitted per ORS 540.520. Following a Final Order approving the application, the applicant would notify OWRD prior to the irrigation season if the applicant would like their water right to remain instream during that season. Similar provisions would apply as outlined in the pre-approval of leases, except that this would be allowed permanently.

Appendix E. Table of Acronyms

ASR	Aquifer Storage and Recovery
Corps	U.S. Army Corps of Engineers
DLCD	Oregon Department of Land Conservation and Development
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
IHMT	Oregon's Interagency Hazard Mitigation Team
IWRS	Oregon's Integrated Water Resources Strategy
NDMC	National Drought Mitigation Center
NHMP	Natural Hazards Mitigation Plan
ODFW	Oregon Department of Fish and Wildlife
OEM	Oregon Office of Emergency Management
OAR	Oregon Administrative Rules
OHA	Oregon Health Authority
ORS	Oregon Revised Statutes
OWRD	Oregon Water Resources Department
OWRC	Oregon Water Resources Commission
OWUA	Oregon Water Utilities Association
POD	Point of Diversion
RCAC	Rural Community Assistance Corporation
WMCP	Water Management and Conservation Plan

Appendix F. List of References

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