Overview

- Intro to the Willamette System
- North Santiam Water Management
- Willamette BiOp
- 2016 Water Year in Context
- Willamette River Basin Review Feasibility Study
- Resilience
- Questions and answers
1943 Willamette Valley Flood

Oregon State Archives, Oregon Water Resources Department, OWR0085
History

- **1936** - Congress passed Flood Control Act authorizing Corps to survey flood problems in Willamette Basin

- **1938** - Flood Control Act provided for first seven storage reservoirs

![1894 flood, downtown Portland, Willamette River](image-url)
History

- **1940** - Corps began construction of Fern Ridge and Cottage Grove dams

- **1950 and 1962** Flood Control Acts authorized additional structures

- **1969** - 13th dam was completed at Blue River

Construction of Dexter Dam 1954
Authorized Purposes

- Flood Risk Management
- Hydropower
- Navigation
- Irrigation
- Recreation
- Fish & Wildlife
- Water Quality
- Municipal & Industrial Water Supply
WVP Conservation Storage
Total = 1.6 million Acre-feet

- Detroit: 18%
- Fern Ridge: 6%
- Hills Creek: 12%
- Lookout Point: 19%
- Long Tom Subbasin = 6%
- MF Willamette Subbasin = 39%
- McKenzie Subbasin = 14%
- Coast Fork Subbasin = 6%
- Fall Creek: 7%
- Dorena: 4%
- Cottage Grove: 2%
- Santiam Subbasin = 35%
- Green Peter: 16%
- Blue River: 5%
- Cougar: 9%
- Foster: 2%
Water Storage in the Basin

- The Corps relies primarily on rainfall during the months of April, May and early June to fill its system of 13 dams and reservoirs in the Willamette River basin.

- Snow pack provides about 10% of the reservoirs’ total water storage.

- Snow in the Basin is typically melted by June – so snow pack itself doesn’t sustain the runoff. Groundwater is what provides some summer inflow.
Water Management Summary

- 13 Corps dams in the Willamette Valley are operated as a single system
- Corps must balance between competing authorized purposes
- Water management decisions include collaboration with partners
Water Management Partners

- Corps
- NOAA
- Bonneville Power Admin.
- U.S. Bureau of Reclamation
- U.S. Fish & Wildlife
- U.S. Forest Service
- OR Dept. of Fish & Wildlife
- OR Water Resources Dept.
- OR Dept. of Env. Quality
- OR Dept. of Agriculture
- The Nature Conservancy
- County government
- Elected officials
- Hatcheries
- OR State Marine Board
- OR State University
- City of Corvallis
- City of Eugene
- City of Salem
- City of Springfield
- City of Cottage Grove
- City of Oakridge
WVP Conservation Season Operating Criteria

- Minimum instream flows for fish (Apr-Jun)
- Tributary flows for fish (Apr-Oct)
- Mainstem flow augmentation for water quality (July-Oct)
- Water for out-of-stream needs
- Refill and drawdown priorities
- Special operations
Reservoir Drawdown Priorities
(April - June)

First: Green Peter
Second: Cougar
Third: Lookout Point, Hills Creek
Fourth: Blue River
Fifth: Fall Creek, Dorena, Cottage Grove
Last: Detroit, Fern Ridge, Foster
Reservoir Drawdown Priorities
(July - October)

First: Lookout Point
Second: Cougar
Third: Hills Creek
Fourth: Green Peter, Blue River
Fifth: Fall Creek, Dorena, Cottage Grove
Last: Fern Ridge, Detroit, Foster
Water Control Diagram

- Defined in the original authorization of the project
- Analysis based on flood risks and hydrologic science of the day
- Sets guidelines for risk management and balancing project benefits
Detroit Reservoir
Flood Control Rule Curve

Major Flood Season | Conservation Storing Season | Conservation Release Season | Fall Drawdown | Major Flood Season
---|---|---|---|---

Exclusive Flood Control Storage Elevation 1563.5 - 1574 ft (37,000 acre-feet)

Reservoir Refill

Conservation Storage Elevation 1450 - 1563.5 ft (282,000 acre-feet)

Power Pool Storage Elevation 1425 - 1450 ft (40,000 acre-feet)

Unuseable Storage Elevation 1200 - 1425 ft (115,000 acre-feet)
Detroit Project Annual

- Forebay (1 day)
- Water Control Diagram
- Top of Max Flood Control (1574)
- Top of Flood Control (1569)
- Interim Risk Reduction Measure (1568.5)
- Top of Conservation (1553.5)
- Spillway Crest (1541)

Inflow (1 day)
Outflow (1 day)
Normal Evacuation Rate (10000)
Maximum Evacuation Rate (17000)

Elevation (feet)
Flow (cfs)

- Jul - Aug - Sep - Oct - Nov - Dec - Jan - Feb - Mar - Apr - May - Jun - Jul

2015 - 2016
Willamette BiOp

- Research Monitoring and Evaluation efforts
  - Downstream fish passage, temperature control, effectiveness of actions already been undertaken
- Detroit/Big Cliff RPAs:
  - Minto adult collection facility complete and operating in 2013
  - Detroit temperature control
  - Detroit downstream fish passage
Willamette BiOp

- Meet ramp rates and flow targets
  - Willamette River mainstem and tributaries
- Interim operations to improve conditions
  - Fish passage, spawning, incubation and rearing until permanent solutions can be developed and completed
Biological Opinion (ESA) Actions

SHORT TERM:

- **Flow Requirements:**
  - Feb 1-March 15- 1,000 cfs
  - March 16-May 31- 1,500 cfs
  - June 1-July 16- 1,200 cfs
  - July 16-August 31- 1,000 cfs
  - Sept 1- Oct 15- 1,500 cfs
  - Oct 16-Jan 31- 1,200 cfs

- **Operational Temperature Control:** we can spill surface water if elevation is >1544’
Mountain Snowpack

- Historic Snowpack Range
- Current Snowpack
- Normal Snowpack

NRCS Oregon Basin Outlook Report
Detroit Lake Forecast 2016 (as of 7/18/16)

DETROIT

LAKE LEVEL (FT)

DATE


INFLOW AND OUTFLOW (CFS)

0 5000 10000 15000 20000 25000 30000

1380 1400 1420 1440 1460 1480 1500 1520 1540 1560 1580

Rule Curve Actual Elevation Today Inflow Outflow
Willamette River Basin Review
Reallocation Study Authority

Authorized by House Committee on Public Works on September 8, 1988:

“...whether modifications to the existing projects are warranted and determine the need for further improvements with the Willamette River Basin (the Basin) in the interest of water resources improvements”
## Willamette River Basin Review

### Purpose and Need

<table>
<thead>
<tr>
<th><strong>Purpose</strong></th>
<th><strong>Need</strong></th>
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<tr>
<td>Evaluate reallocation of joint use conservation storage behind Corps dams in the Willamette Valley to authorized purposes.</td>
<td>There is not adequate natural streamflow or groundwater to meet all future instream and out-of-stream needs.</td>
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State has identified federal reservoirs as a preferred new water source.
Willamette River Basin Review
Goals and Objectives

- Re-allocate existing Corps conservation storage among authorized purposes while minimizing impacts to other uses.
  - Municipal and industrial water supply
  - Irrigated agriculture
  - Fisheries resources in river reaches affected by Corps’ reservoirs

- Remove existing state and Federal administrative policies that constrain allocation/sale of storage.
Willamette River Basin Review
Study Team Collaboration/Outreach

Study Team Collaboration
- Oregon Water Resources Department (non-Federal Sponsor)
- Corps/Contractor team
- Oregon Department of Agriculture

Outreach
- Water demand stakeholder groups
- NEPA Scoping meetings
- Website access, Fact sheets
Willamette River Basin Review
Planning Constraints

- Maintain flood risk management benefits
- Water reallocation options will fit within existing project rule curves
- Reallocation limited to existing 1.6 M acre-feet
- No construction/modification of structural facilities
- 100% reliable stored water every year is not viable
- Maintain operational ability to meet BiOp flow targets to meet ESA-listed fish
- Minimize negative impacts to existing reservoir and downstream recreation users
- Minimize impacts to hydropower generation at Willamette hydropower projects
Willamette River Basin Review
Likelihood of Refill

Total Willamette Project Storage Above Minimum Conservation Zone, Non-Exceedance Percentages

- Total System Storage
- 5%
- 10%
- 25%
- 50%
- 75%
- 90%
- 95%
Willamette River Basin Review
Evaluation Criteria

- **Flood Risk Management** * - no increase to number of days above bank full
- **Cost Effectiveness and Financial Feasibility** - annualized costs of alternatives over 50-year period
- **Environmental Compliance Requirements** * - NEPA, ESA, other environmental requirements met
- **Recreation Impacts** - reservoir boat ramp availability / free-flowing reach user days
- **Hydropower Impacts** - impacts assessed and coordinated with Bonneville Power Administration
- **Technical Feasibility** *
- **Climate Change Adaptability** - evaluate expected hydrology regime changes over period of analysis
- **Reliability** - meets water demands up to 80% of time
Willamette River Basin Review Timeline

- Feasibility Cost Share Agreement Signed – 19 Aug 2015
- Alternatives Milestone – 01 Apr 2016
- Develop Demands for M&I, Irrigation, F/W – 30 Sep 2016
- Evaluate Alternatives for Meeting Demands – Oct 2016 – Apr 2017
- Draft Recommended Plan (Tentatively Selected Plan) – 05 Jul 2017
- Draft Integrated Feasibility/EA Complete – 06 Oct 2017
- Agency Decision – 12 Jan 2018
- Chief’s Report – 17 Aug 2018
Willamette River Basin Review
Public Participation

- Periodic Water User Group Meetings
  - M&I
  - Irrigation
  - Instream Flows

- Public Information/Scoping Meetings
  - Initial meetings held Spring 2016
  - Next round when draft water demand information compiled

- Email Distribution (wbr@usace.army.mil)

- Website
Building Resilience

- Climate Variability
- Limitations of Infrastructure
- Future Construction
- Water Allocation
For more information:

- About the Corps: (Portland District web site)
  www.nwp.usace.army.mil

- Reservoir Levels:
  http://www.nwd-wc.usace.army.mil/nwp/wm/

- River Levels: (NW River Forecast Center)
  http://www.nwrfc.noaa.gov/

- Portland District Public Affairs Office:
  503-808-4510