

Willamette Valley Project Overview

Regional Solutions Mid-Valley Committee Meeting

July 29, 2016

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U.S. ARMY US Army Corps of Engineers
BUILDING STRONG



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



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



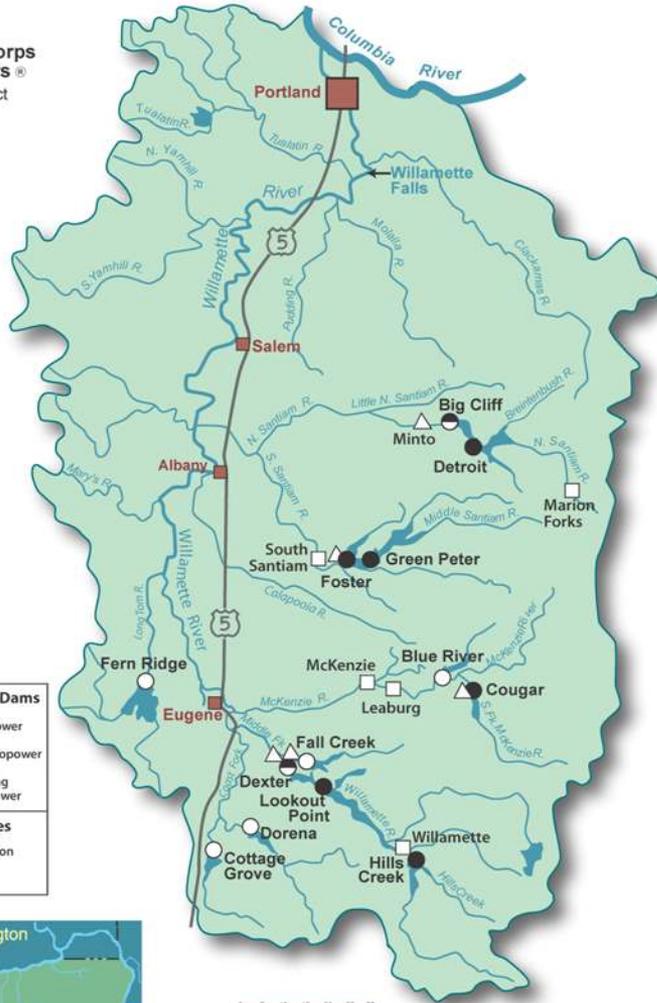
Construction of Dexter Dam 1954



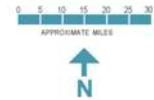
The Willamette River Basin



US Army Corps
of Engineers
Portland District



- Multipurpose Dams**
- With Hydropower
 - Without Hydropower
 - ◐ Re - Regulating with Hydropower
- Fish Facilities**
- △ Adult Collection
 - Hatchery



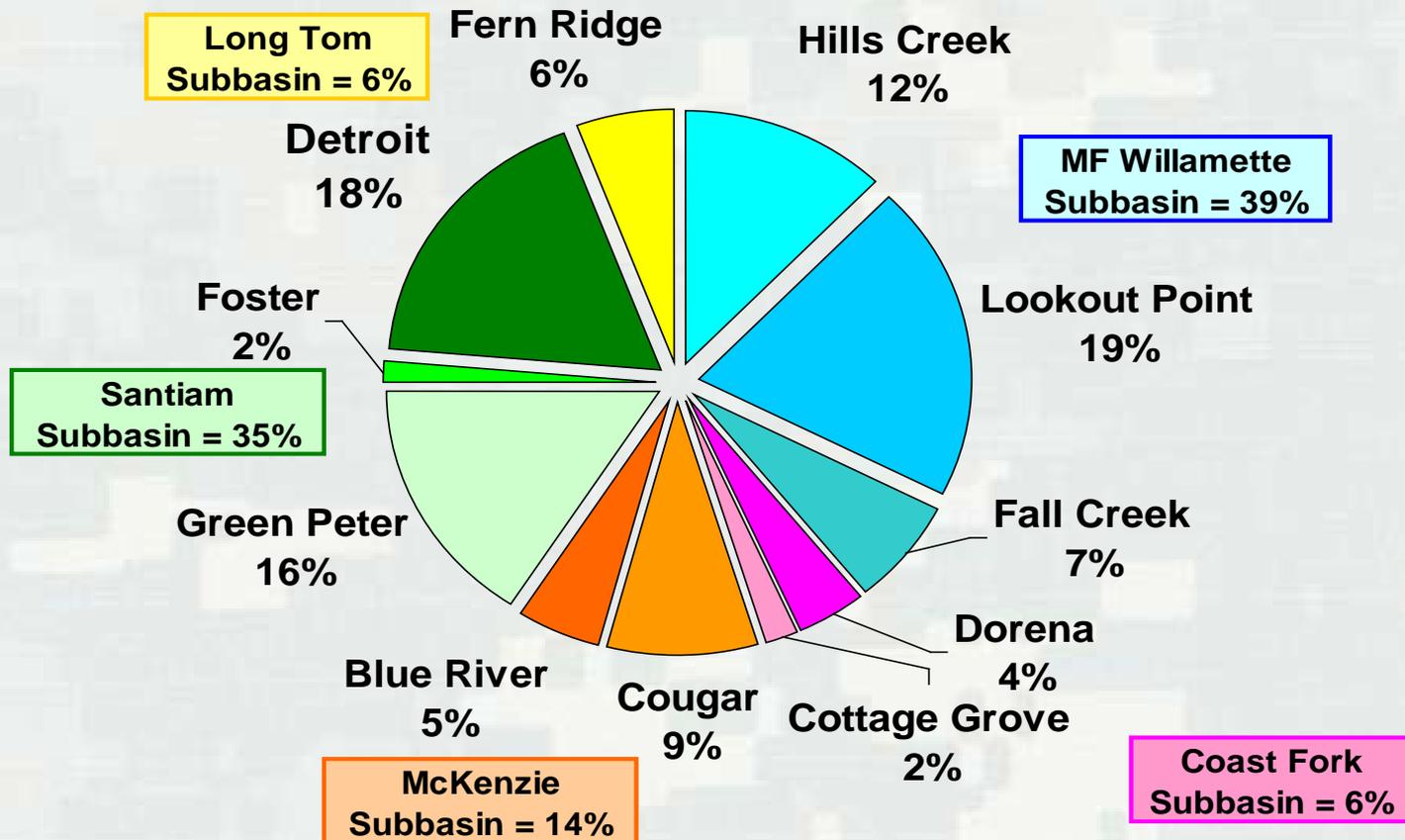
Authorized Purposes

- Flood Risk Management
- Hydropower
- Navigation
- Irrigation
- Recreation
- Fish & Wildlife
- Water Quality
- Municipal & Industrial Water Supply



WVP Conservation Storage

Total = 1.6 million Acre-feet



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)

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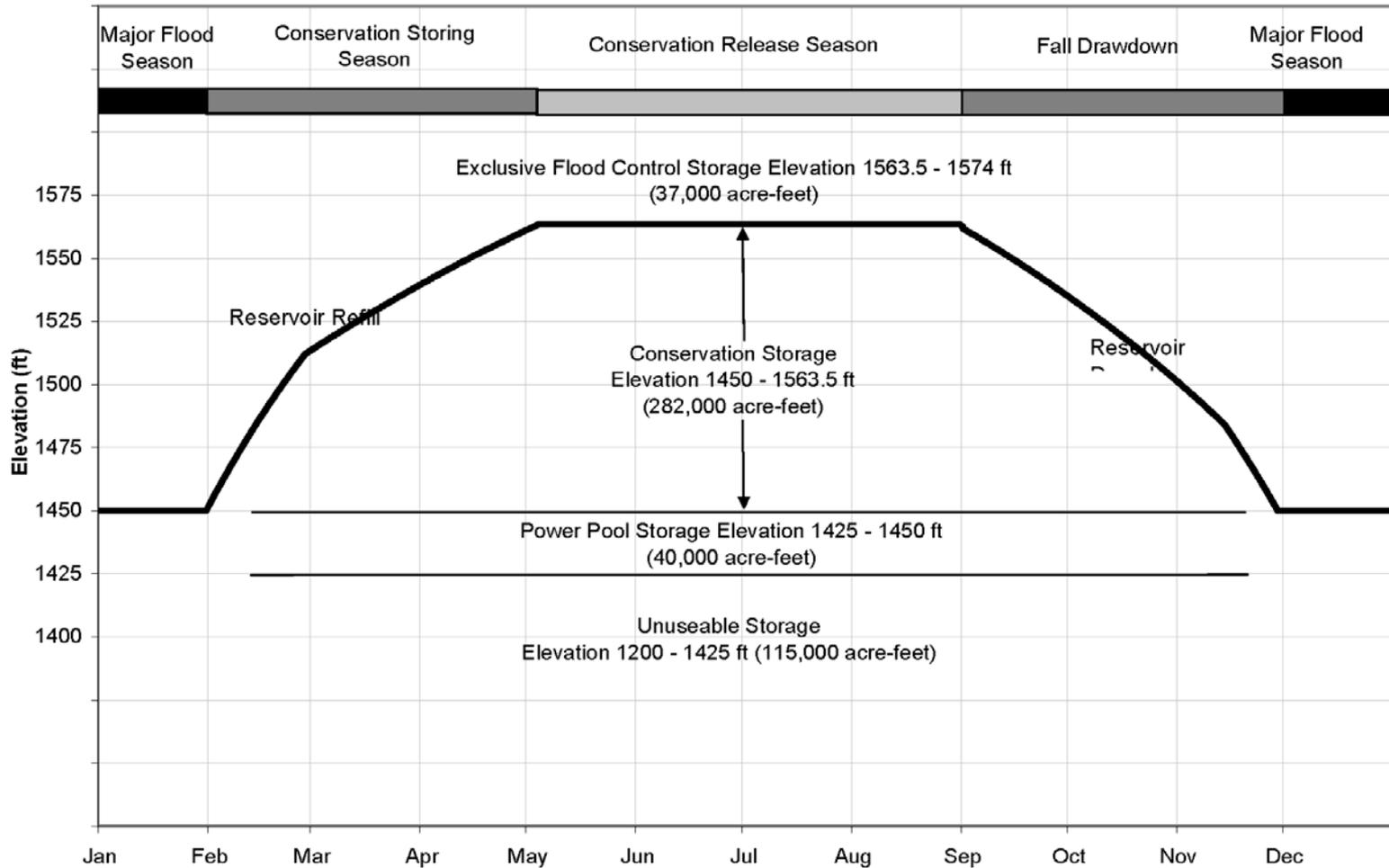


Water Control Diagram

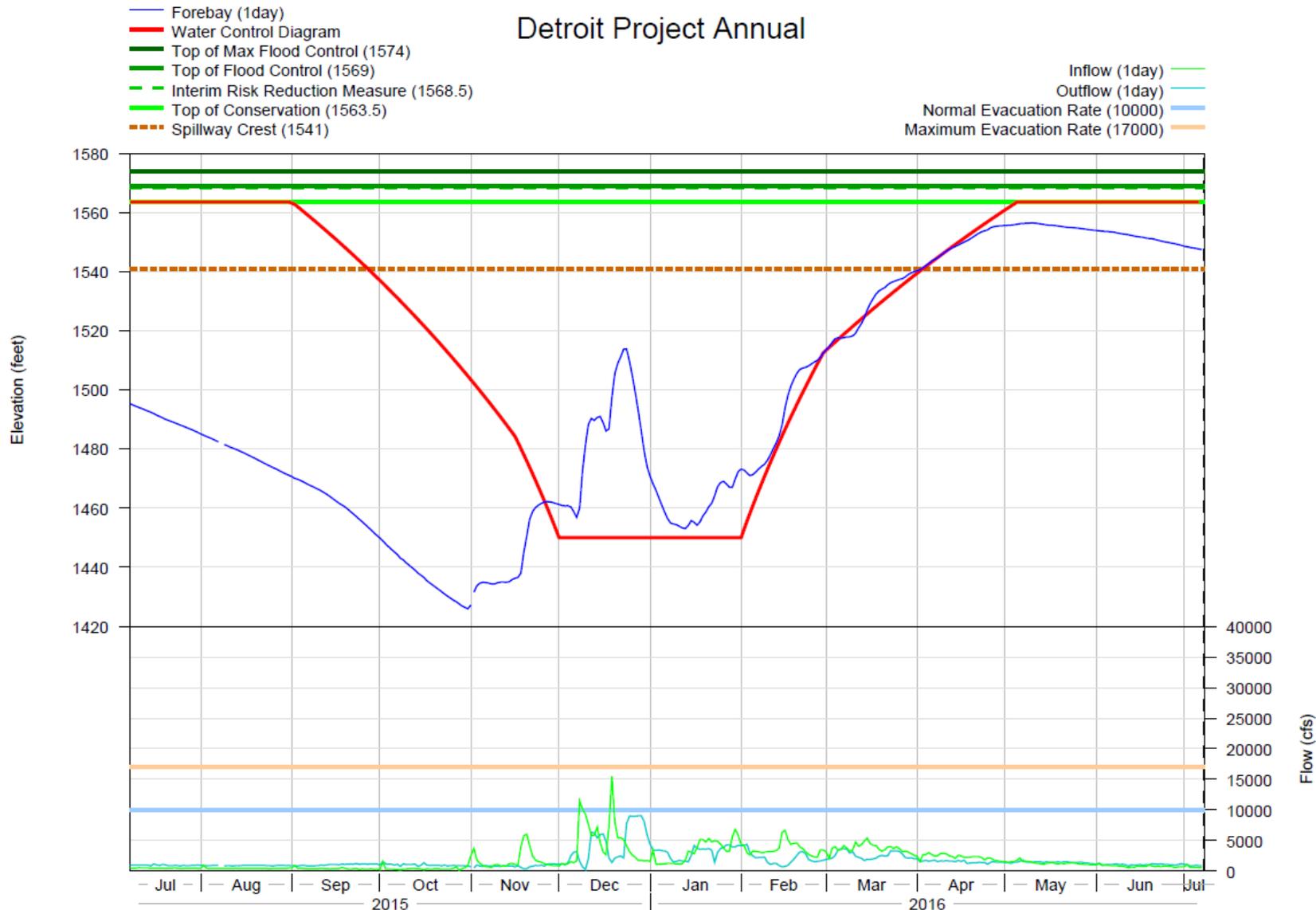
- Defined in the original authorization of the project
- Analysis based on flood risks and hydrologic science of the day
- Sets guidelines for risk management and balancing project benefits



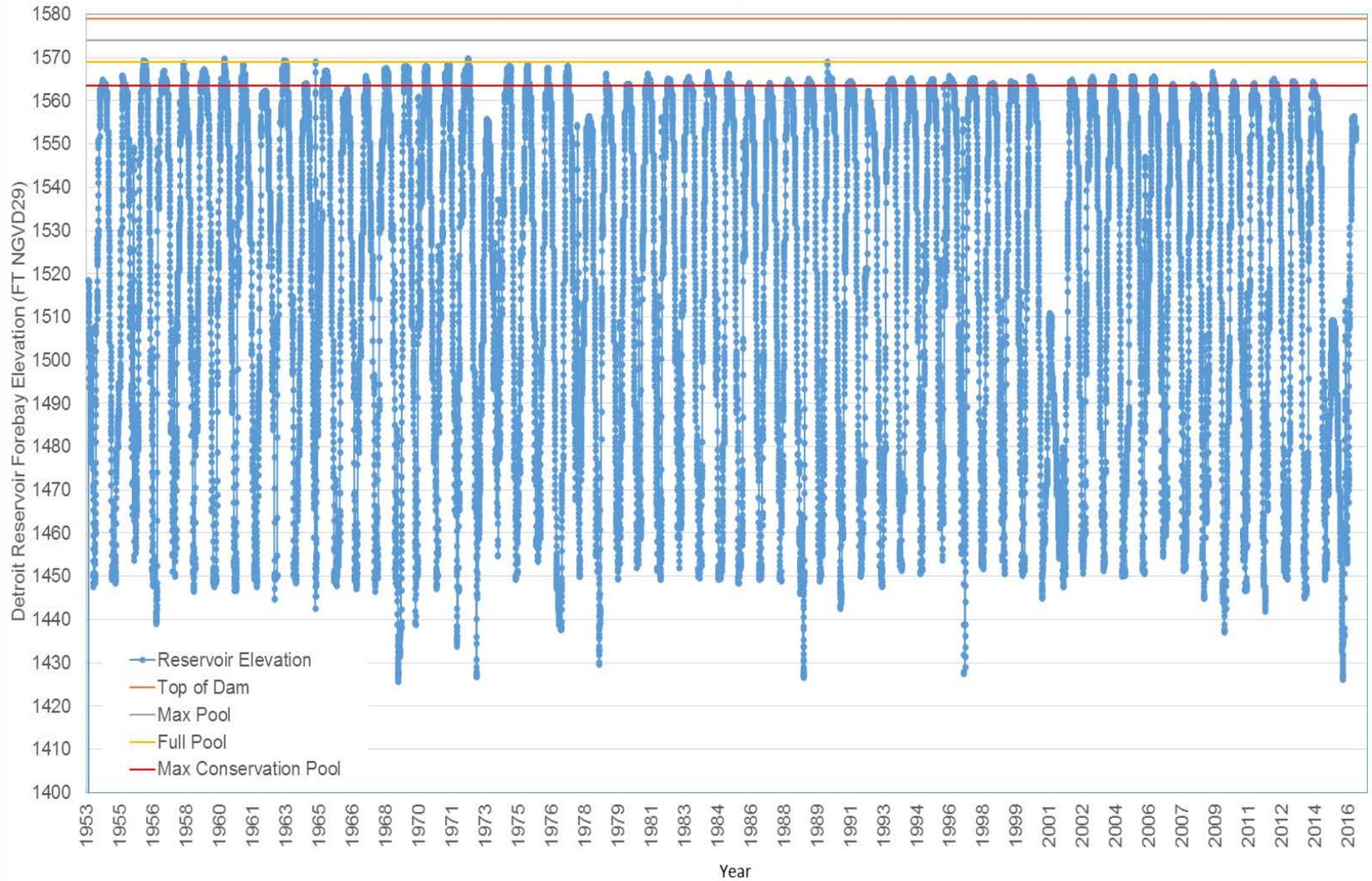
Detroit Reservoir Flood Control Rule Curve



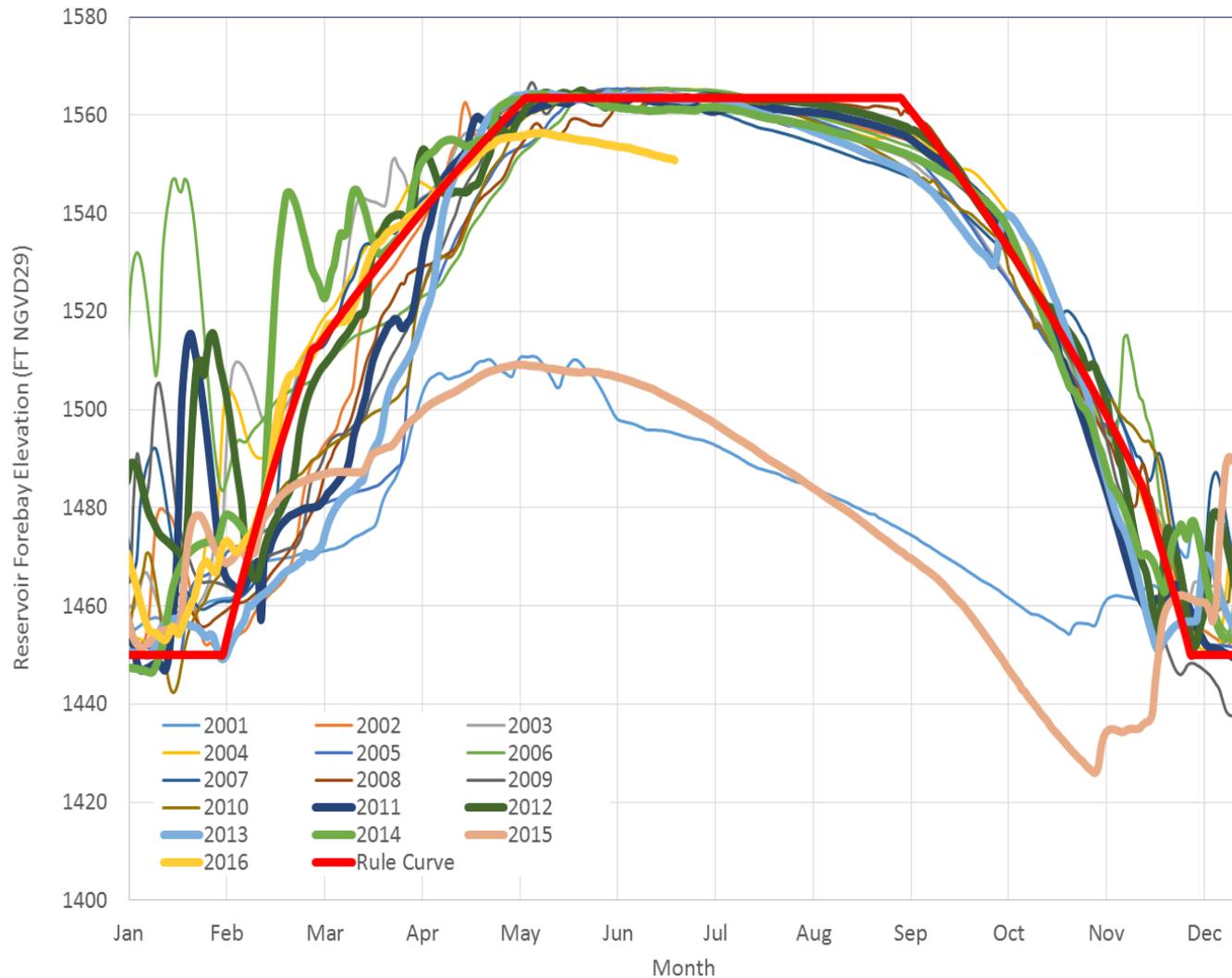
Detroit Project Annual



Detroit Reservoir Forebay Elevations



Detroit Reservoir Forebay Elevations



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



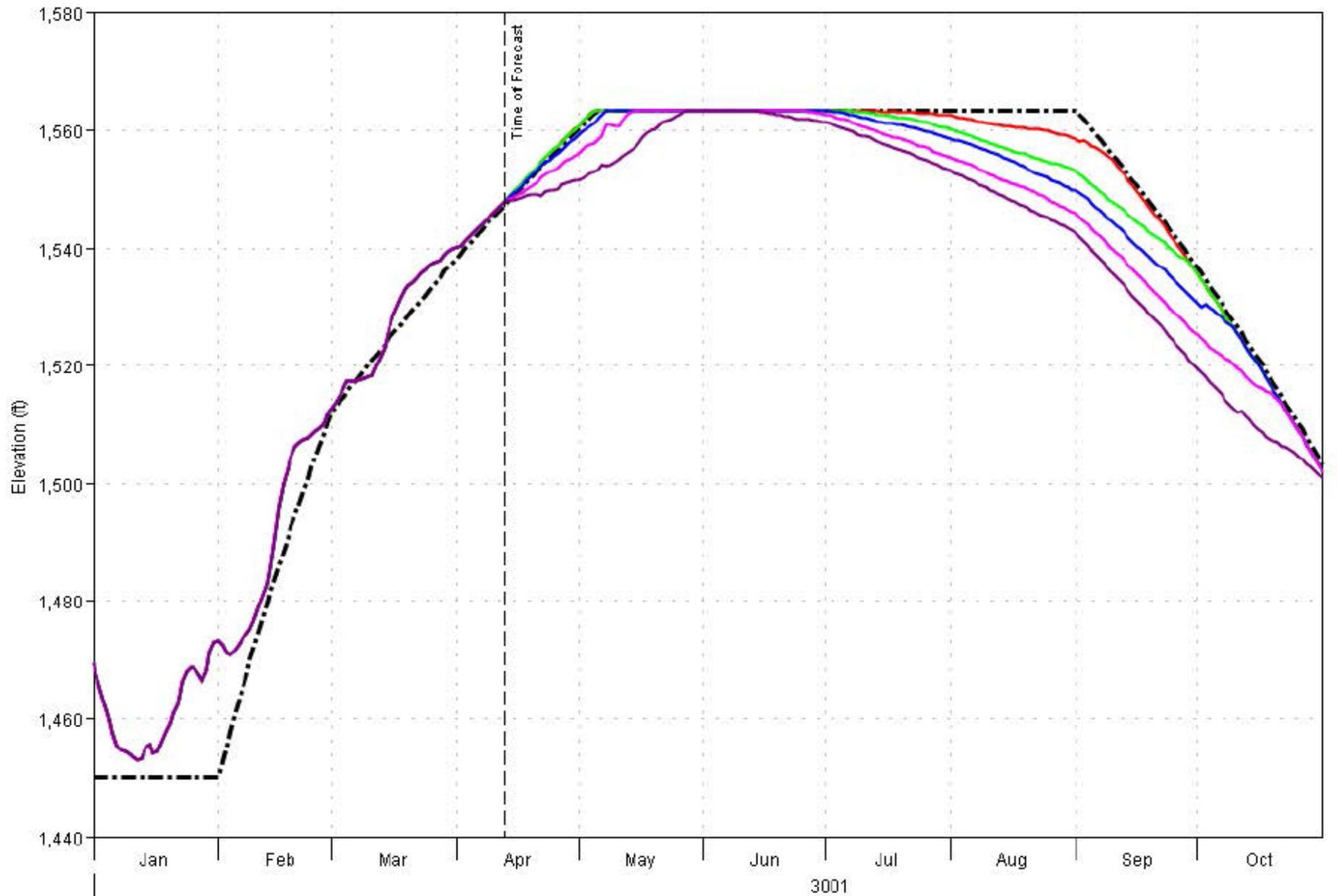
Biological Opinion (ESA) Actions

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 $>1544'$



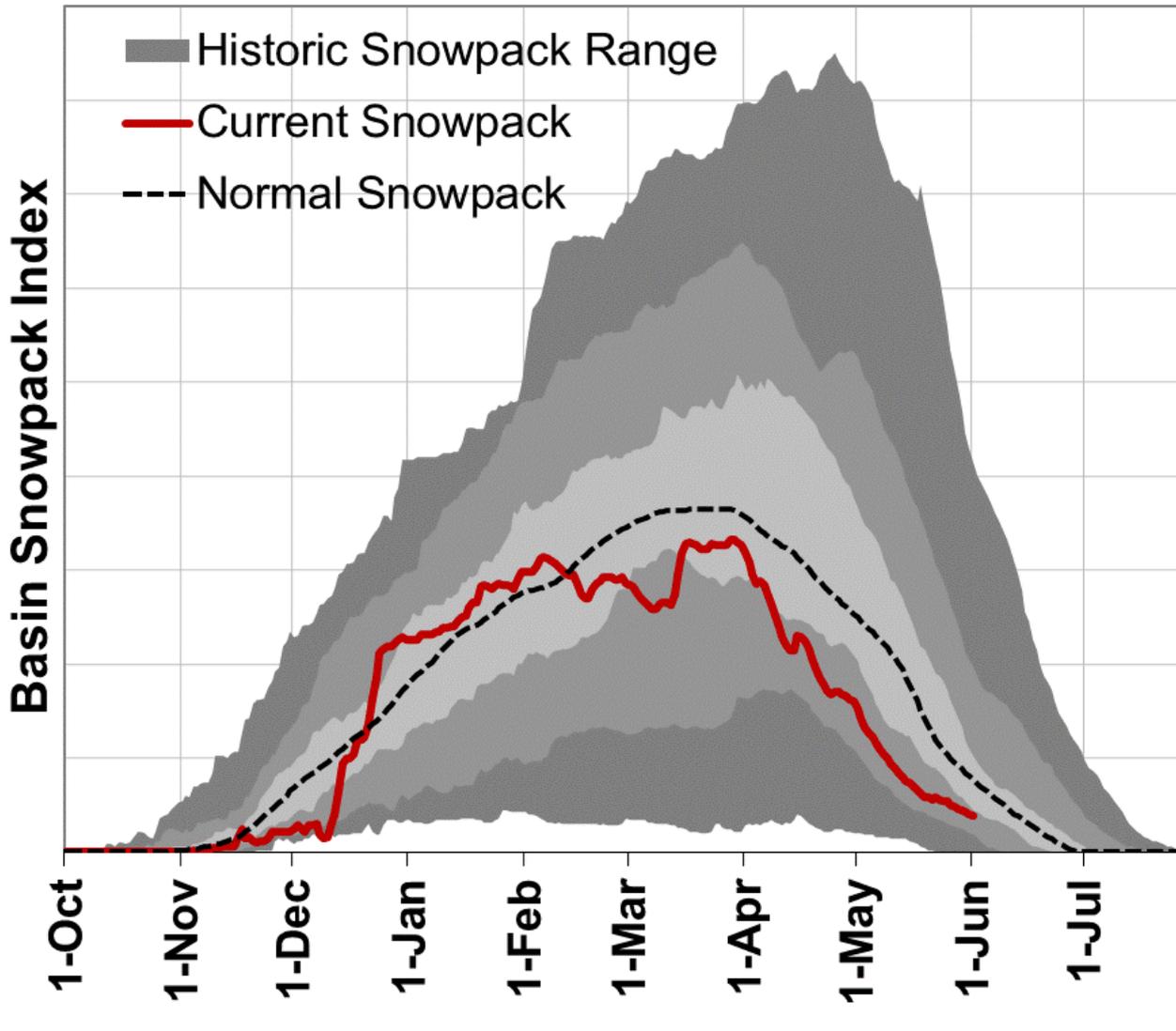
DETROIT LAKE Elevation NRCs Apr 2016 Forecast (Median)



Rule Curve
 95% Elevation Non-Exceedance
 75% Elevation Non-Exceedance
 50% Elevation Non-Exceedance

25% Elevation Non-Exceedance
 5% Elevation Non-Exceedance

Mountain Snowpack

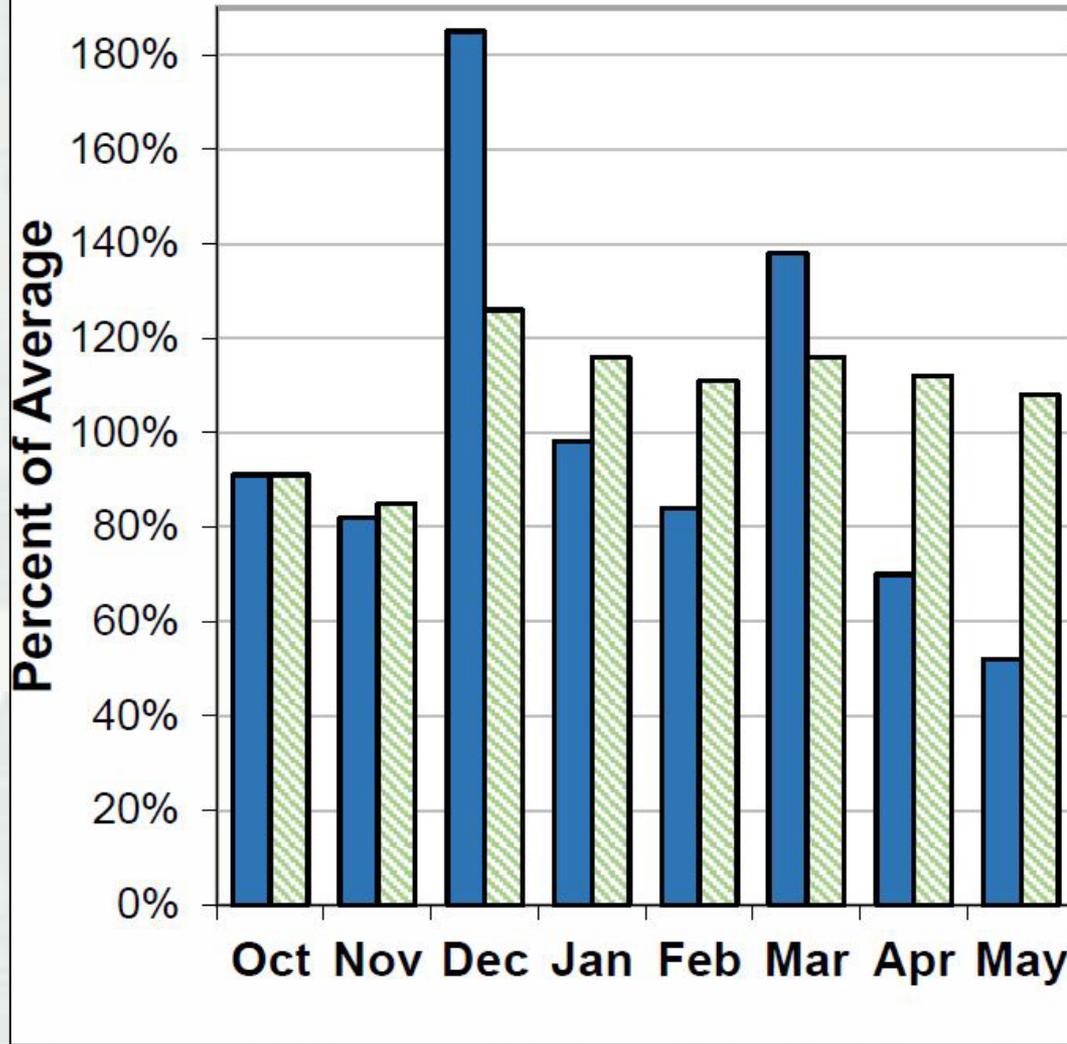


NRCS Oregon Basin Outlook Report



Basin Precipitation

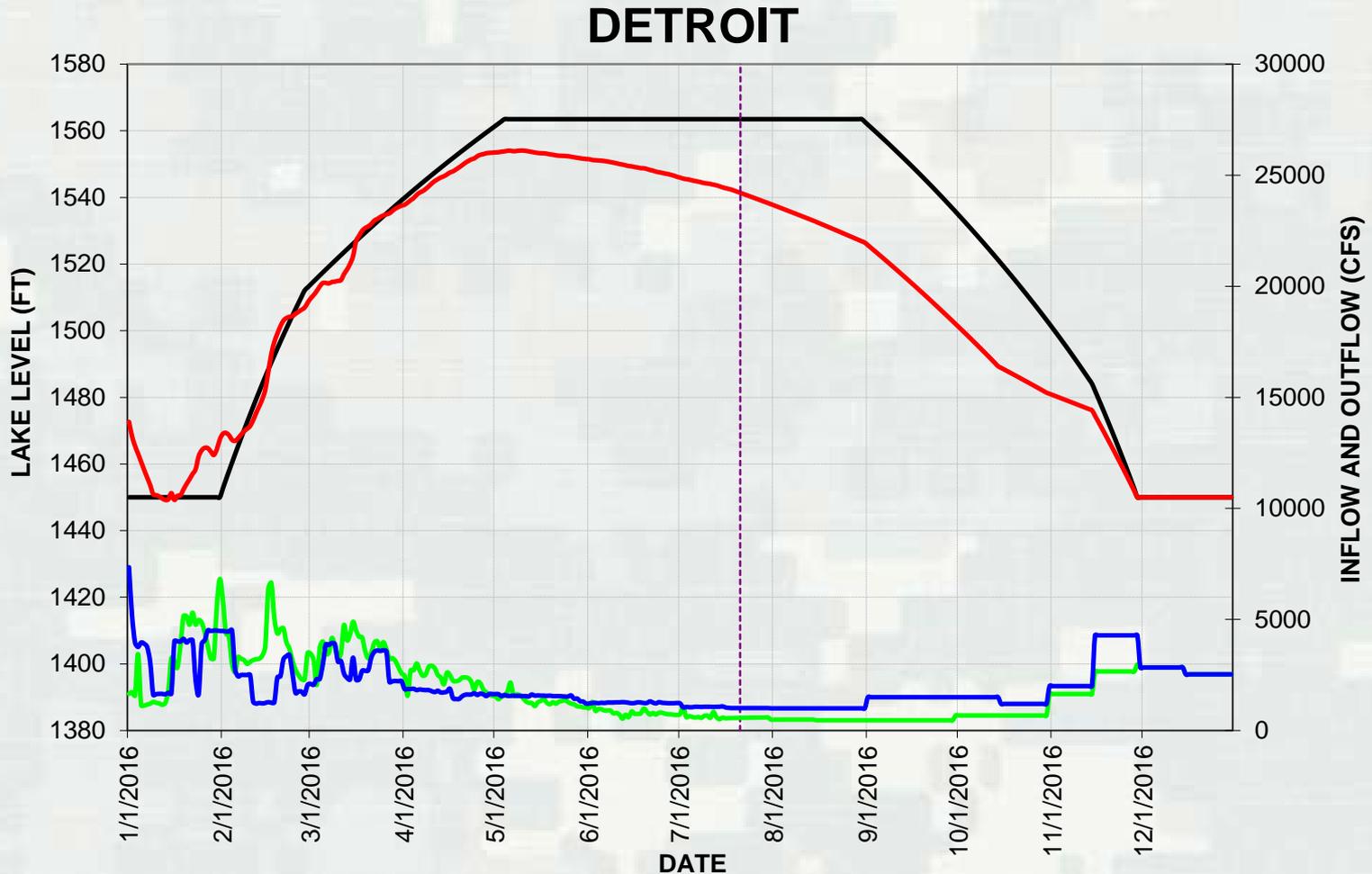
■ Monthly ▨ Water Year to Date



NRCS Oregon Basin Outlook Report



Detroit Lake Forecast 2016 (as of 7/18/16)



— Rule Curve — Actual Elevation - - - Today — Inflow — Outflow

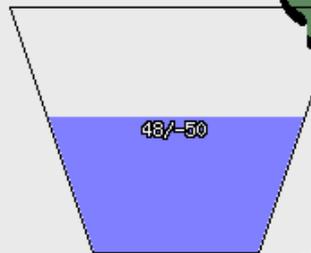


The Willamette Basin

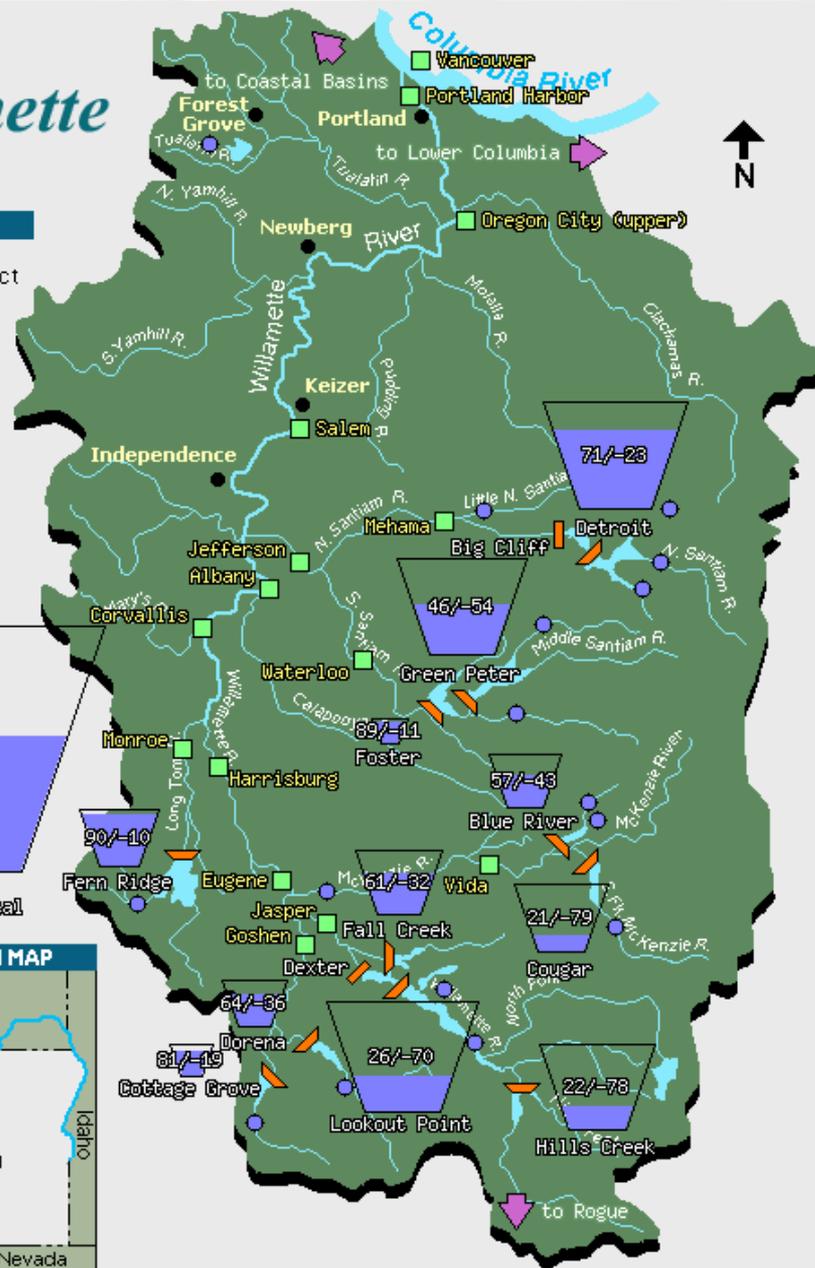
LEGEND

-  Storage Project
-  Run of River
-  Gage
-  No Alerts
-  Bank Full
-  Flood Stage

Overview



Willamette Total



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

Purpose

Evaluate reallocation of joint use conservation storage behind Corps dams in the Willamette Valley to authorized purposes.

Need

There is not adequate natural streamflow or groundwater to meet all future instream and out-of-stream needs.

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

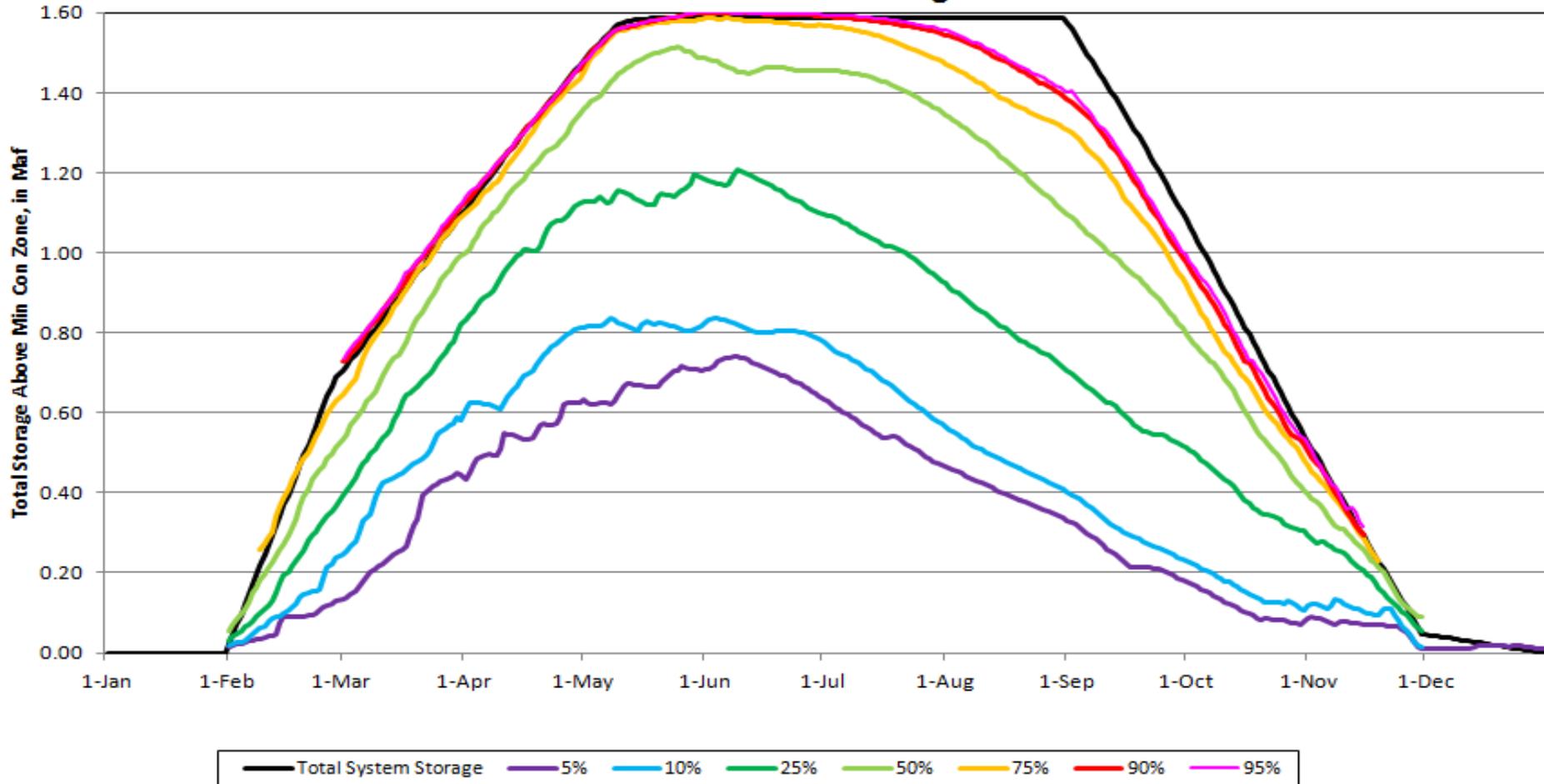
- Maintain flood risk management benefits
- Water reallocation options will fit within existing project rule curves
- Reallocation limited to existing 1.6 M acre-feet
- No construction/modification of structural facilities
- 100% reliable stored water every year is not viable
- Maintain operational ability 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



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
 - ▶ <http://www.nwp.usace.army.mil/About/Current-projects/Willamette-Basin-Review/>



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

