

RECLAMATION

Managing Water in the West

Yellowtail Dam & Bighorn Lake Revised Operating Criteria Overview

Billings, MT
October, 2011

RECLAMATION

Managing Water in the West

DRAFT BIGHORN LAKE OPERATING CRITERIA EVALUATION STUDY & REPORT



U. S. Department of the Interior

Bureau of Reclamation

Great Plains Region

Draft Report

September 14, 2010

RECLAMATION

Yellowtail Unit Authorized Purpose

- **Irrigation**
- **Flood Control**
- **Power Generation**
- **Sediment Retention**
- **Fishery and Waterfowl Resource Improvement**
 - Includes both River and Reservoir
- **Recreation Enhancement**
- **Municipal-Industrial Water Supply**
- **Tribal Allocations**

Yellowtail Unit Authorized Purpose

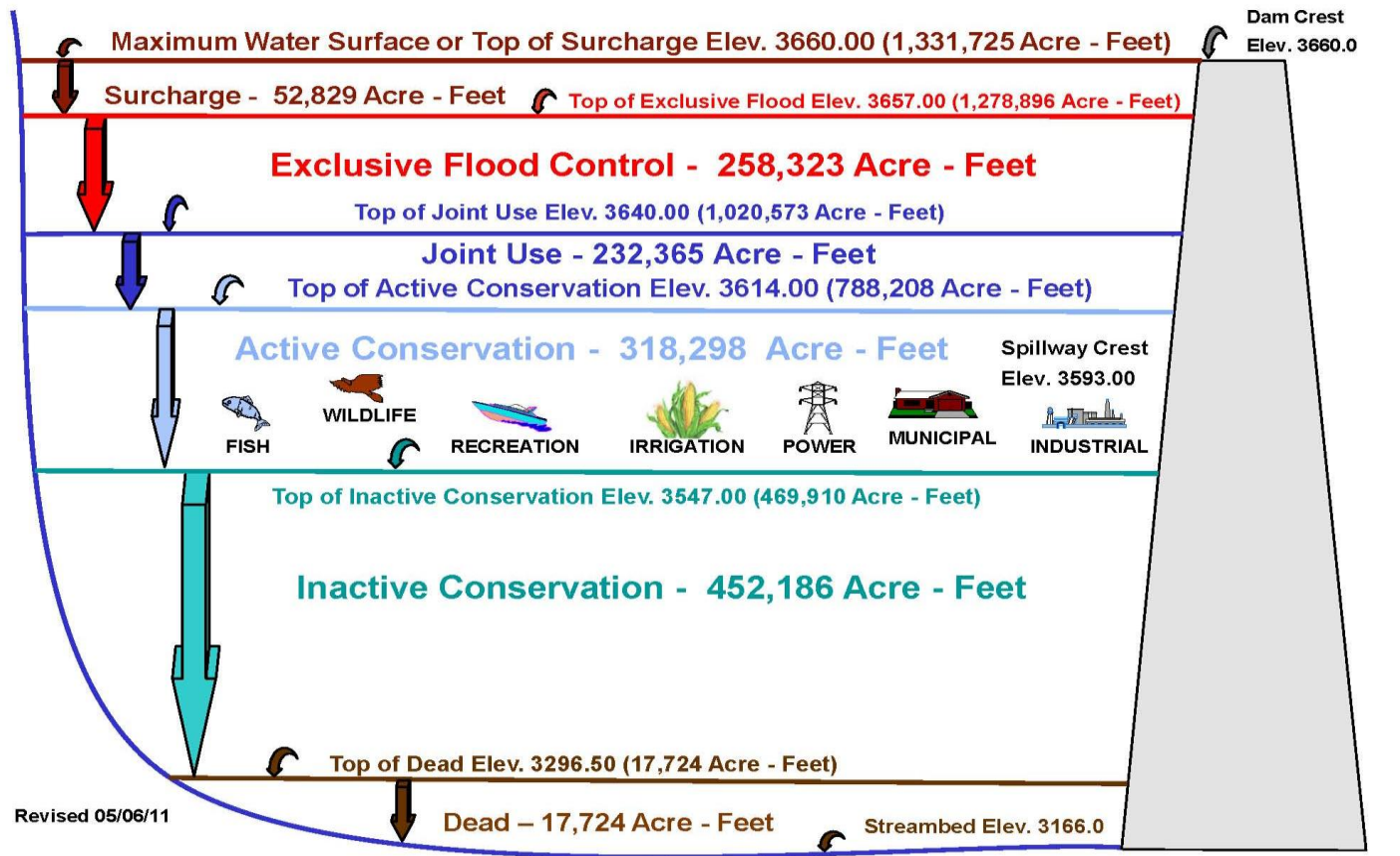
Irrigation Season

- Bighorn Canal: 400-550 CFS (directly from the Afterbay)
- Bighorn River: 1,400 cfs for Senior Water Rights along the Bighorn River downstream of the Afterbay dam.

Yellowtail Unit

Authorized Purpose: Flood Control

BIGHORN LAKE (YELLOWTAIL DAM) ALLOCATIONS



Rule Curves

Date

Draft Criteria

Old Criteria

Apr-July

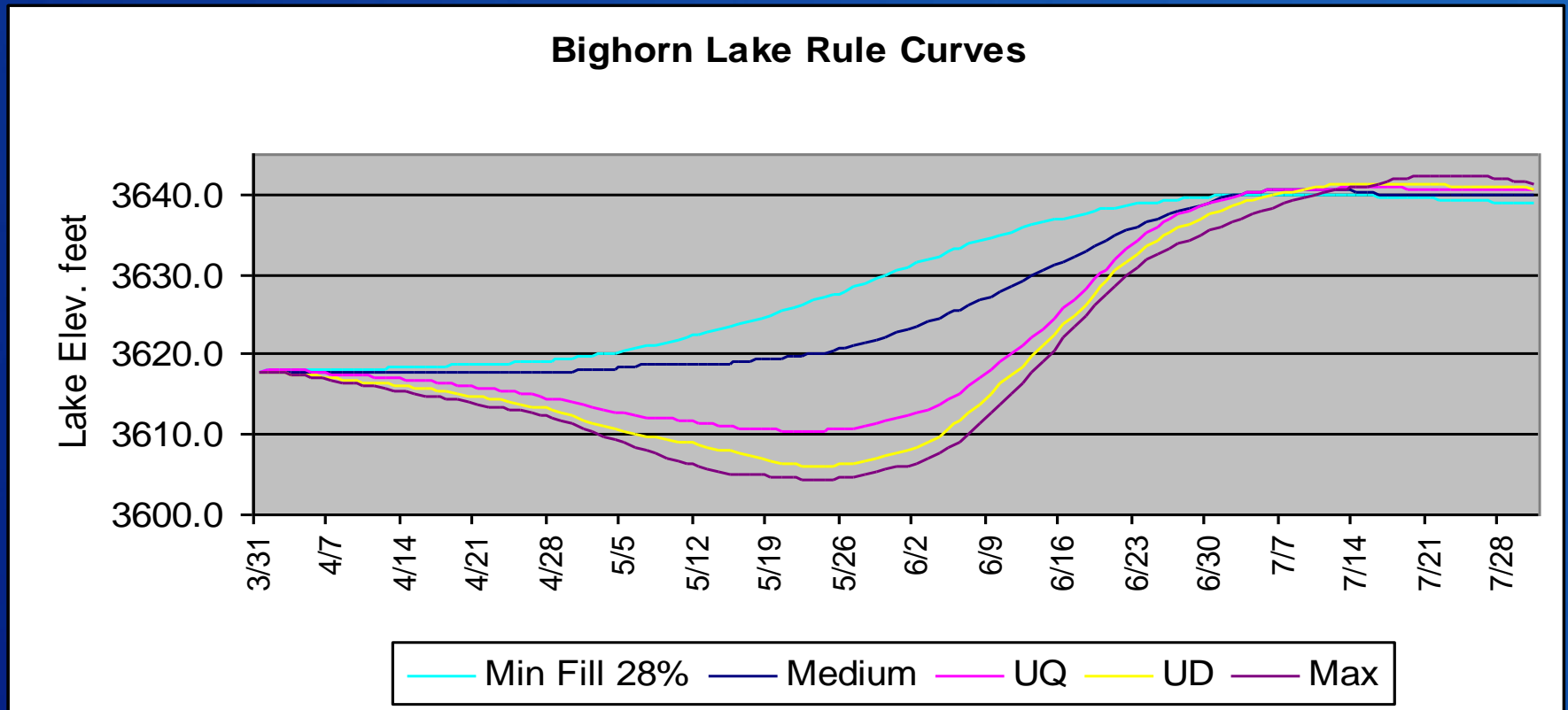
Target (Apr 1-May 23)

Targets (April 1)

Low Point

3603-3618

3605-3614



Yellowtail Unit Authorized Purpose

Power Generation

- Limit discharge to a maximum of 4,500 cfs to retain power peaking capability;
- Minimize releases that bypass the turbine capacity of 7,800 cfs;
- Schedule releases (when possible) to meet higher seasonal power demands during the hot summer months and the cold winter months.

Yellowtail Unit Authorized Purpose

Sediment Retention

As of July 2007

- Since 1965, 103,415 AF of sediment has accumulated in Bighorn Lake: Average Annual rate of 2,480 acre-feet.
 - Above 3,547 63,685 AF
 - Below 3547 39,776 AF
- Planning phase estimated 100 year sediment accumulation: 315,000 AF, or 3,150 Annual Average.
 - Above 3,547 75,000 AF
 - Below 3547 240,000 AF

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Yellowtail Unit Authorized Purpose

Municipal-Industrial Water Supply

- **Presently Reclamation has one storage contract commitment to PP&L for 6,000 acre-feet per year.**

Yellowtail Unit Authorized Purpose

Tribal Allocations

- Northern Cheyenne Tribe: 30,000 AF Annually
- Crow Tribe: 300,000 AF Annually

Yellowtail Unit Authorized Purpose

Fishery and Waterfowl Resource Improvement

- Includes both River and Reservoir

Recreation Enhancement

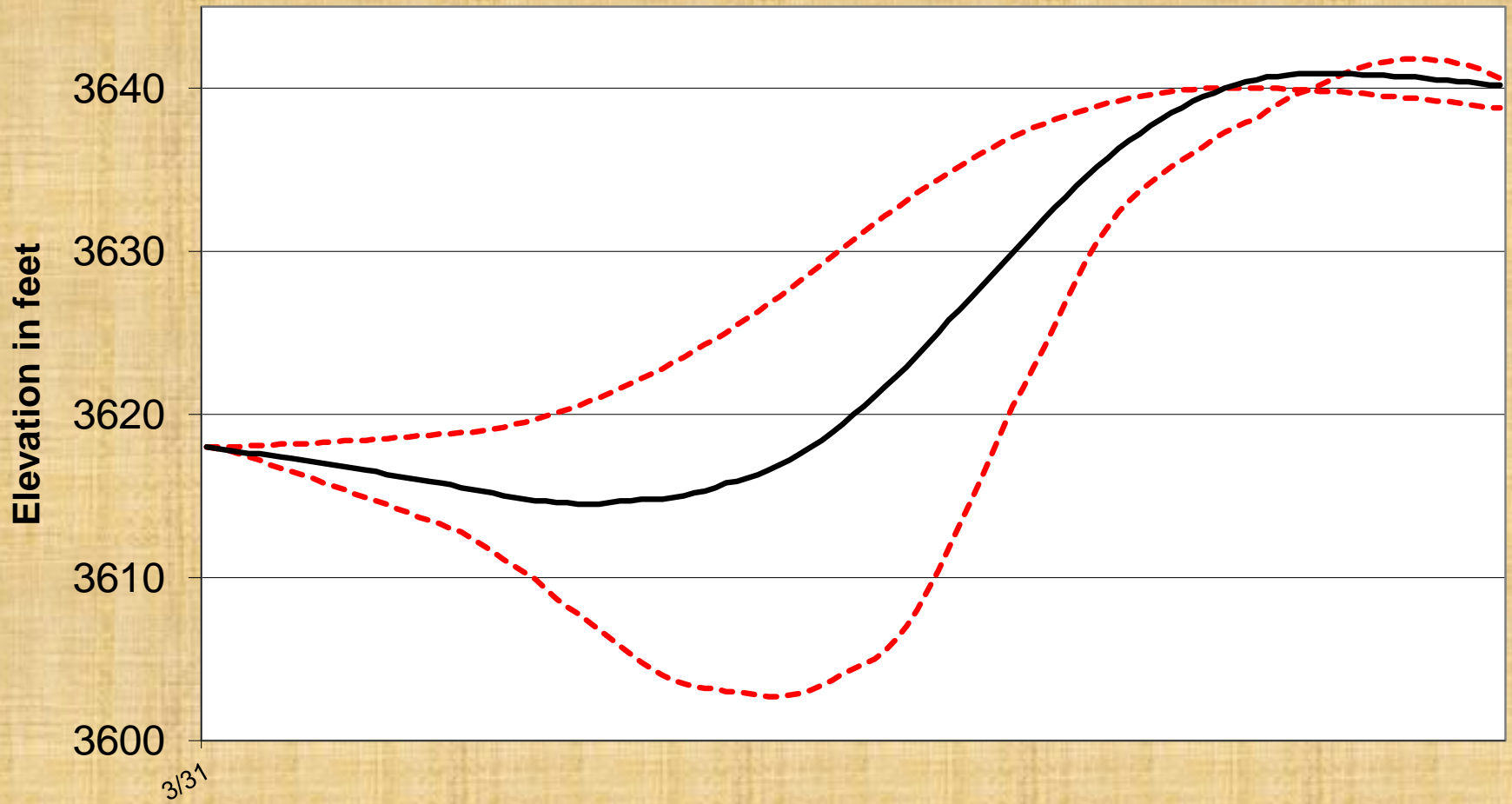
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Reservoir Level Targets

<u>Date</u>	<u>Draft Criteria Target Elevation</u>	<u>Old Criteria Targets</u>
Oct 31	3638-3640	3630-3635
Mar 31	3616.7-3620.6	3605-3614
Apr-July Low Point	Rule Curve 3603-3618	3605-3614
July 31	3640	3640

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Bighorn Lake Elevation for Forecast A-J Inflow with Rule Curves



--- Min Fill --- Max — Forecast Avg Year

River Release Targets


Old Criteria

- Optimum Instream Flow 2,500 cfs
- Standard Instream Flow 2,000 cfs
- Minimum Instream Flow 1,500 cfs
- Absolute Minimum 1,000 cfs

Draft Criteria

- Preferred Instream Flow **3,500 cfs**
- Optimum Instream Flow 2,500 cfs
- Standard Instream Flow 2,000 cfs
- Minimum Instream Flow 1,500 cfs
- Absolute Minimum 1,000 cfs

(Preferred fishery flow provided by Montana FW&P during issued group meetings.)

An aerial photograph of a large dam and reservoir in a rugged, mountainous landscape. The dam is a concrete structure with a spillway, located in the lower-left quadrant. The reservoir is a large body of water that fills a valley, with a prominent U-shaped bend in the middle. The surrounding terrain is characterized by steep, rocky slopes and deep canyons. The sky is clear and blue. The text "Discussion", "Comments", and "Questions" is overlaid in the center of the image in a bright cyan color.

Discussion

Comments

Questions