Cowlitz Water Management: Instream flow and reservoir conditions update and impacts

Florian Leischner

Cowlitz River Annual Project Review and Fisheries Science Conference

July 10, 2019
Cowlitz Water Management:

Power Generation

Stakeholders

Ecology
Outline

• Current Issues

• Water Management Impact on Generation, Fish, and Stakeholders (*recreation, flood management, water supply, etc.*)
Current Issues - Adjusted operation of Mossyrock Dam

- New seismic studies indicated potential issues with spillway piers during large earthquake
- Precautionary operation of Riffle Lake below (749 ft. vs. 778 ft.)
- Impact downstream and lake levels
Current Issues - 2019 Cowlitz Basin Drought
Current Issues -
2019 Cowlitz Basin Drought – Precipitation

Monthly Precipitation (% of normal)
Current Issues -
2019 Cowlitz Basin Drought – Snowpack

![Snow Water Equivalent Chart](chart.png)

Plot Created: 07/03/2019 12:02pm PDT
Observations Provided by NRCS
Current Issues -
2019 Cowlitz Basin Drought - Inflows

[Chart showing monthly inflows for January, February, March, April, May, and June, with inflow data for 2019 and inflow average indicated.]

Monthly Inflow (cfs)

- January: Inflow 2019: 6000 cfs, Inflow Average: 9000 cfs
- February: Inflow 2019: 4000 cfs, Inflow Average: 8000 cfs
- March: Inflow 2019: 3500 cfs, Inflow Average: 7000 cfs
- April: Inflow 2019: 2000 cfs
- May and June: No data provided.
Current Issues - 2019 Cowlitz Basin Drought - Inflows

Monthly Inflow (cfs)

Jan    Feb    March   April   May    June

Inflow 2019
Inflow Average
Current Issues -
2019 Cowlitz Basin Drought - Inflows

<table>
<thead>
<tr>
<th>Month</th>
<th>Inflow 2019</th>
<th>Inflow Average</th>
<th>Winter &amp; Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>69%</td>
<td>69%</td>
<td>69%</td>
</tr>
<tr>
<td>Feb</td>
<td>4000</td>
<td>7000</td>
<td>8000</td>
</tr>
<tr>
<td>March</td>
<td>4000</td>
<td>6000</td>
<td>6000</td>
</tr>
<tr>
<td>April</td>
<td>9000</td>
<td>8000</td>
<td>8000</td>
</tr>
<tr>
<td>May</td>
<td>9000</td>
<td>8000</td>
<td>8000</td>
</tr>
<tr>
<td>June</td>
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Current Issues - 2019 Cowlitz Basin Drought – Riffe Lake

Riffe Lake Refill Probability - June 12, 2019
RFC Inflow Forecast - 733 ft starting elevation
Discharge: 2900 cfs with FTF through June 30; 2500 cfs July-August

3% probability of refill to 748 ft
Current Issues -

2019 Cowlitz Basin Drought - Downstream

Monthly discharge from Mayfield dam (cfs)

- Outflow Average
- Outflow 2019

Jan | Feb | March | April | May | June

0  | 2,000 | 4,000 | 6,000 | 8,000 | 10,000 | 12,000
Current Issues - Mayfield Unit #41 Maintenance

• One month outage of main unit in Mayfield powerhouse

• July 22-26 testing and commissioning

• Impact on total river flow and ramping
# Cowlitz Water Management-Ramping

- In effect at flows less than 6,000 cfs
- Based on WDFW standard ramping requirements for protection adults and juveniles

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<th>Time of Year</th>
<th>Daylight Rates*</th>
<th>Night Rates**</th>
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<tr>
<td>February 16 to June 15</td>
<td>No Ramping</td>
<td>2 inches per hour</td>
</tr>
<tr>
<td>June 16 to October 31</td>
<td>1 inch per hour</td>
<td>1 inch per hour</td>
</tr>
<tr>
<td>November 1 to February 15</td>
<td>2 inches per hour</td>
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Cowlitz Water Management-Ramping

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Biological need:

- **Spring** – Small fry in channel margins / outmigration at night
- **Summer** – Larger juveniles, adults
- **Fall/Winter** – Larger juveniles, adults
Cowlitz Water Management - Minimum Flow

March 1 – June 30

5,000 cfs (unless forecast indicates no refill)

If flows < 8,000 cfs → weekly fish pulses of 120%

July 1 – Aug. 14

2,000 cfs
Cowlitz Water Management - Minimum Flow

Aug. 15 – Sept. 30

2,000 cfs
If above 5,000 cfs for more than five days → 5,000 cfs minimum

Oct. 1 – Nov. 20

3,500 cfs
If above 5,000 cfs for more than five days → 5,000 cfs minimum

Nov. 21 – Feb. 28

5,000 cfs OR
8 inches below highest consecutive five-day average flow during which active spawning occurred
Lewis County PUD Cowlitz Falls Project

1,000 cfs minimum flow requirement

<

1,800 cfs minimum turbine capacity

• At inflows below 1,800 cfs – operation is cycled between spill and turbine.

• Coordinated between utilities to split spill between fish collector (~500 cfs) and dam (~500 cfs).
Cowlitz Water Management - Impact on Recreation - Lakes

Mayfield Lake

- 415-425 ft. allowed operating range; mostly above 419 ft.
- Lower Mayfield Lake to 410 feet of elevation Sept. 15-30, 2019 for boat launch repair.
Cowlitz Water Management - Impact on Recreation - Lakes

Riffe Lake

• Mossyrock boat launch ~708 ft. elevation (75 ft. operating range)

• Taidnapam North useable until ~720 ft.

• Swim beaches

• Others (Pedestrian Bridge, etc.)
Cowlitz Water Management- Impact on Recreation - River

Lower Cowlitz boating and fishing

- Varying flows seasonally, flows can change daily
- Different flows – different fishing methods and access
Lower Cowlitz boating and fishing

- Angling success/flow study: Analysis of correlation of river discharge and fishing method angling success
- Self-imposed minimum 2,400 cfs vs. 2,000 cfs during summer, informed by stakeholders
Cowlitz Project Water Management - Data Availability

- **MyTPU.org/LakeLevels** – lake levels, river flows, downstream forecast
- **River Forecast Center** ([https://www.nwrfc.noaa.gov/rfc/](https://www.nwrfc.noaa.gov/rfc/))
- **USGS gaging stations** ([https://waterdata.usgs.gov/WA/nwis/current/?type=flow](https://waterdata.usgs.gov/WA/nwis/current/?type=flow))
- **Hydro model for upper Cowlitz**
IF YOU HAVE ANY QUESTIONS

LET MINNOW