

Project Name	SA Article 13: Minimum Flow Spring 2023 minimum flow reduction
Date Proposal Summited	3/28/2023
Date of Requested Decision	4/4/2023
Requested By	Matt Peter
Date of Decision	4/11/2023

FTC Decision and Justification	
<p>Members Present: FTC Voting members present represented WDFW, Ecology, and Tacoma Power. This Decision Document will be circulated to those not present and become final on April 11 if no objections are received.</p> <p>The FTC supports the proposed minimum flow reduction as described in this Decision Document.</p>	

Proposed Decision for Consideration	
<p>Tacoma Power is consulting with the FTC on a proposal to lower the minimum flows in the Cowlitz River below Mayfield Dam to improve reservoir refill probabilities for this summer. The minimum flow would be reduced from 5,000 cfs plus fish transport flows to 4,000 cfs plus fish transport flows. This will be achieved by reducing flows over two nights to be scheduled as soon as possible following consultation with the FTC. Tacoma Power will coordinate with the FTC throughout the proposed flow reduction.</p>	

Background	
<p>Since 2017, Tacoma Power has managed Riffe Lake with a “full pool” elevation of 749 ft, 29.5 ft below constructed capacity (778.5 ft). This affects year-round reservoir operations and makes balancing priorities including the environment, grid reliability, recreation, and power generation more challenging than under typical operations. Reduced capacity may make achieving spring refill, depending on the timing and volume of runoff, and then managing the reservoir draft throughout the summer for multiple uses particularly challenging.</p> <p>Inflows to Riffe Lake have been exceptionally low since the beginning of the water year, particularly during February (4,250 cfs mean daily) and March (3,532 cfs mean daily as of March 28) during which they have been about half of the historical average. The reservoir has been generally drafting with periods of refill following rain events in November and December and increased draft during regional cold snaps (Figure 1). With the exception of cold periods, flows at Mayfield have been near minimum since February 1 (Figure 2). The reservoir has drafted from a winter peak elevation of 703 ft (January 3) to 676 ft (March 28).</p>	

Tacoma Power uses NOAA River Forecast Center (RFC) forecasts to model refill probabilities. Based on that model, the current refill probability to a target of 748.5 ft by July 1 is 60% (Figures 2 and 3); there is a 25 percent chance that refill is at or below 742 ft and the lowest scenario predicts refill to only 721 ft. The RFC forecast is based on inflows during weather years 1981 through 2022 and does not specifically incorporate the current NOAA Climate Prediction Center Seasonal Outlook (issued March 16), which predicts equal chances of normal temperatures but is leaning toward below normal precipitation in the April through June period. Based on this information, Tacoma Power proposes to reduce the minimum flow now to assure summer refill. A reduction to 4,000 cfs plus fish transport flows increases the refill probability using the RFC forecast to 86% (Figure 4) with the lowest refill scenario at 739 ft.

There are some circumstances in which Tacoma Power may need to pick up discharge and generation before the reservoir fills. These include managing high side flows from the Tilton River, covering Tacoma's own generation need if very hot weather occurs, and managing reservoir elevations during high-volume runoff events. Tilton side flows could occur at any time, but extreme hot weather and high-volume runoff events are more likely to occur later in the spring. Tacoma Power also may need to pick up discharge and generation if the reservoir fills well before the end of June.

The proposed minimum flow reduction is planned to run for two and a half months, through June 30 or as needed to assure refill. Initiating the flow reduction early in the spring is a proactive approach. Tacoma Power will use ongoing evaluation of hydrologic conditions and refill probability models to identify any needs for further changes to flow (decreases or increases) to assure refill while minimizing the likelihood of larger, late season adjustments. Tacoma Power will update the FTC on these ongoing evaluations throughout the refill season.

In accordance with the license and in consultation with the FTC, Tacoma Power proposes to reduce flows in the lower Cowlitz River to 4,000 cfs plus fish transport flows to support refill at Riffe Lake. This will be achieved by reducing flows over two nights to be scheduled as soon as possible following consultation with the FTC. Tacoma Power has had to reduce minimum flows during some portion of the spring in 10 of the last 26 years, most recently in 2019 and 2021 (Table 1).

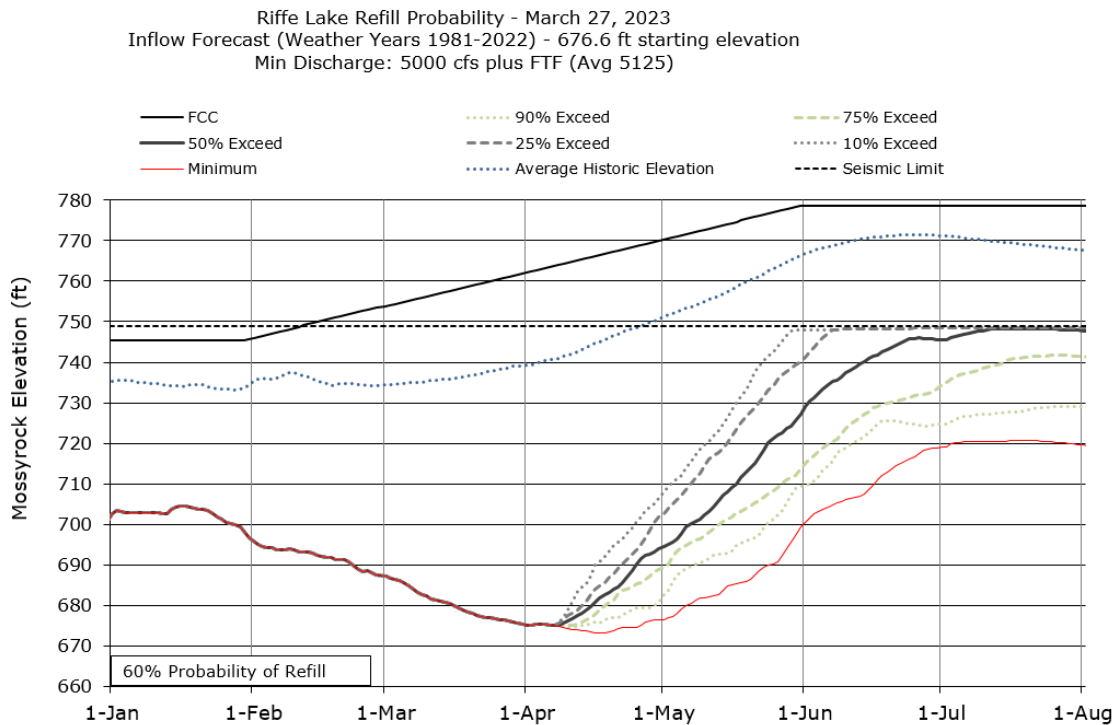


Figure 1. Riffe Lake refill probability curves starting March 27, 2023 using the NOAA River Forecast Center prediction inflow exceedances and a standard minimum flow.

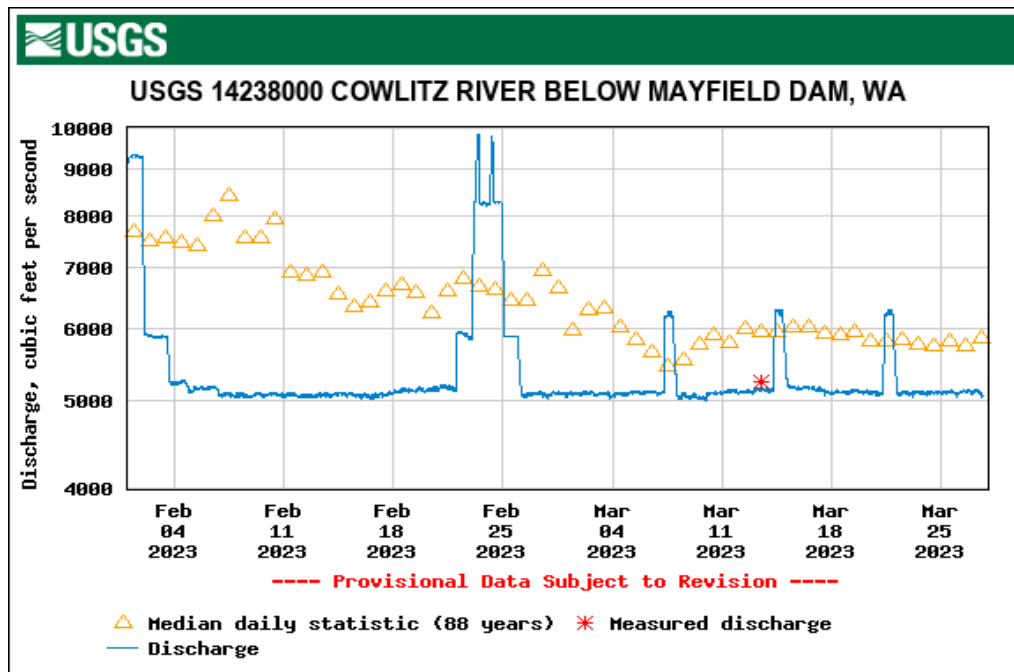


Figure 2. Discharge at Mayfield Dam since February 1. Minimum flow 5,000 cfs with weekly fish transport flows starting March 1.

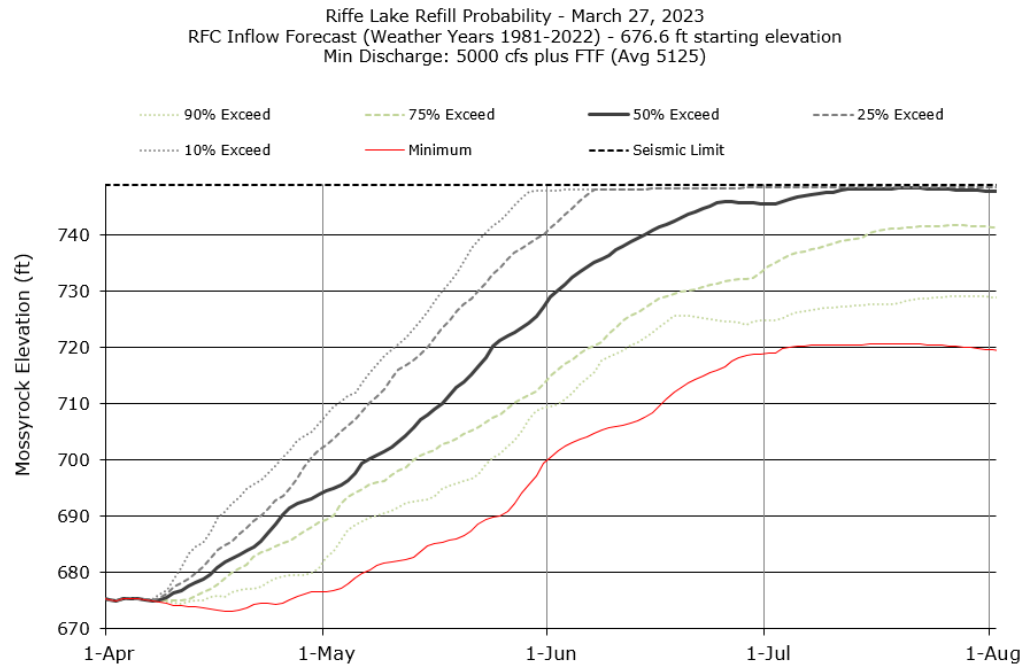


Figure 3. Riffe Lake refill probability curves starting March 27, 2023 using the NOAA River Forecast Center prediction inflow exceedances and a standard minimum flow. Axes have been adjusted to focus on recent reservoir elevations and the refill period. See Figure 1 for reservoir elevations prior to April, historical reservoir elevation, and flood control curve.

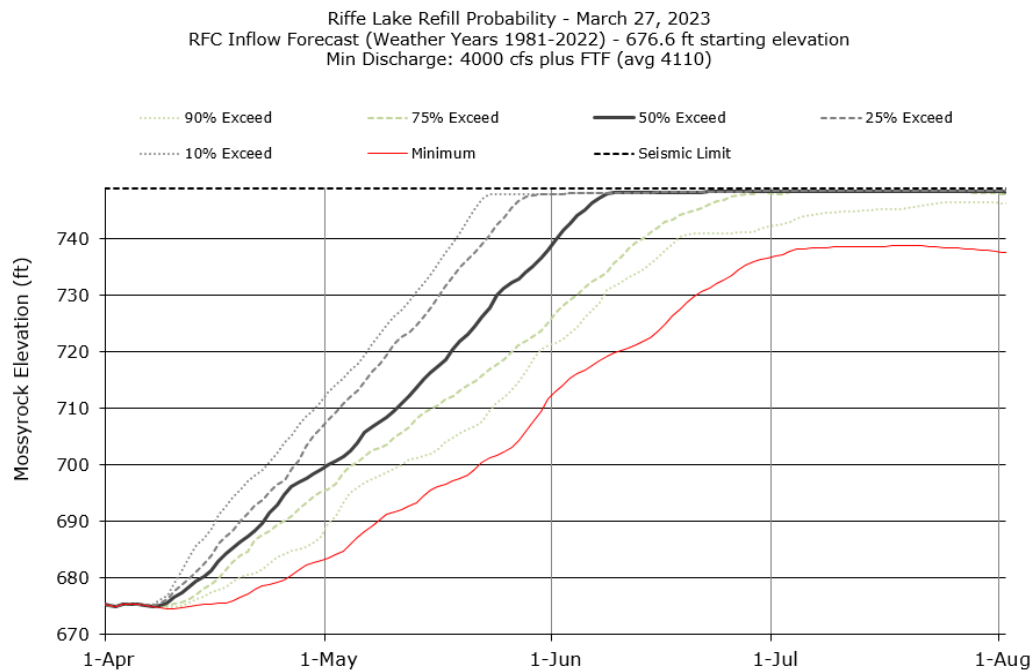


Figure 4. Riffe Lake refill probability curves starting March 27, 2023 using the NOAA River Forecast Center prediction inflow exceedances and the proposed reduced minimum flow. Axes have been adjusted to focus on recent reservoir elevations and the refill period.

Table 1. Instream flow by month (March – June) in the Cowlitz River below Mayfield dam since 1998.

Year	Mar	Apr	May	June
1998	5,094	5,116	3,975	5,357
1999	8,312	6,000	5,071	8,904
2000	5,489	5,091	5,867	6,241
2001	2,573	2,560	2,561	2,593
2002	6,756	7,206	7,796	9,969
2003	9,380	8,385	5,157	3,855
2004	6,670	4,972	3,733	3,932
2005	3,876	3,546	4,087	4,118
2006	5,818	5,162	5,186	5,276
2007	9,557	10,000	5,344	3,911
2008	5,769	5,220	5,808	10,300
2009	5,196	5,193	7,329	8,238
2010	5,139	3,967	4,662	8,465
2011	6,524	10,920	9,815	7,597
2012	9,418	9,781	9,582	8,822
2013	7,317	7,422	6,654	5,801
2014	11,110	8,990	9,364	5,349
2015	4,488	4,251	3,159	3,299
2016	10,190	6,963	5,538	5,442
2017	12,850	11,330	12,850	9,001
2018	5,584	5,480	6,082	5,198
2019	5,175	3,319	2,998	3,005
2020	6,455	5,181	6,856	6,829
2021	7,599	9,029	5,193	5,139*
2022	8,885	8,773	7,245	8,640
2023	5,190**			

* Limited flow reduction in June 2021

** March 2023 MTD as of 3/27

monthly discharges more than 2,500 cfs and less than 3,500 cfs

monthly discharges more than 3,500 cfs and less than 5,000 cfs

License Requirement

LICENSE ARTICLE 13

The Licensee shall release minimum flows from the Project into the Cowlitz River for the protection and enhancement of fish and wildlife resources, riparian vegetation, aesthetic resources and water quality. Flows shall be released as follows:

- a) *March 1 – June 30*

Minimum flow releases from Mayfield Dam shall be 5,000 cfs, unless the March 1 or later inflow forecasts indicate that this flow cannot be achieved and assure reservoir refill. A decision to reduce flows shall only be made after Tacoma has consulted with the Fisheries Technical Committee provided for in the August 2000 Settlement Agreement, or if the Settlement Agreement has become void, with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife and Washington Department of Ecology (referred to as “the FTC or agencies”). Once per week from March through the end of June, or as otherwise agreed with the FTC or agencies, Tacoma will conduct a 12-hour release at the lesser of 8,000 cfs or 120% of the preceding flows for juvenile fish transport flows. Natural flows (e.g., from the Tilton River) that provide the same magnitude of flow pulse may substitute for artificial flow pulsing.

Coordination Need

Tacoma Power will evaluate hydrologic conditions and update refill probability models throughout the minimum flow reduction period. These evaluations will inform any further changes (i.e., increases or decreases) to flow before June 30. Tacoma Power will update the FTC on refill status and outlook at monthly FTC meetings and at least once between meetings through a virtual meeting, conference call, or email.

Tacoma Power and the M&E group will discuss the need and/or opportunity for fish standing monitoring following fish transport flows during the minimum flow reduction period.

Summary of Potential Impacts

Tacoma Power will reduce the minimum flow in the Cowlitz River from the current 5,000 cfs (plus fish transport flows) to 4,000 cfs (plus fish transport flows). This will start as soon as possible following FTC consultation. This reduction will be achieved over two nights. The minimum flow reduction is proposed through June 30 or as needed to assure refill. Tacoma Power will use continue to evaluate hydrologic conditions and refill probability models to identify any needs for further changes to flow (decreases or increases) to assure refill while minimizing the likelihood of larger, late season adjustments, and will communicate with the FTC throughout the refill season.