

Project Name	2025 CFNSC Evaluation Recommendations
Date Proposal Submitted	February 4, 2025
Date of Requested Decision	March 4, 2025
Completed By	Jenise Bauman

FTC Decision and Justification

The FTC approved implementing the three actions proposed by Tacoma Power, supported by the Technical Working Group, and described herein as part of the 2025 evaluation year at the Cowlitz Falls North Shore Collector.

FTC representatives present included: WDFW, Ecology, Yakama Nation, Trout Unlimited, and Tacoma Power.

Decision will become final if committee members who were not present at this meeting do not oppose this proposed decision within 7 days.

Proposed Decision or Consideration

As part of the 2025 evaluation year at the Cowlitz Falls North Shore Collector (CFNSC), Tacoma proposes implementing three actions—supported by the Technical Working Group (TWG)—intended to inform management decisions and/or test hypotheses regarding salmon and steelhead collection efficiency and survival:

1. Analyze alternative tagging strategy for fish capture efficiency for Steelhead, Coho, and Chinook Salmon performance with environmental co-variates to account within the model. These data will be combined with operational covariates designed to better evaluate FCE performance. The use of models that account for outmigration rates when estimating FCE will be explored.
2. Cowlitz Falls North Shore Collector Acoustic Telemetry Study is designed to evaluate three entrance flow regimes to better understand juvenile Chinook Salmon within the zone of influence. Data collected will inform adaptive management actions designed to increase FCE during downstream migration. Weekly tagging and releases are scheduled for nine weeks and will begin as soon as fish are available.
3. Begin moving Coho Salmon parr downstream of the Barrier Dam as a passage strategy to recognize nomadic behavior, a life history strategy where parr migrate back and forth within brackish estuaries and freshwater streams. Evaluation criteria will continue to be discussed within TWG and M&E subcommittees with a plan to bring forward a refined recommendation to a future FTC meeting.

Background

As part of the Cowlitz Hydroelectric Project Federal Energy Regulatory Commission operating license requirements, Tacoma Power is engaged in restoration efforts of anadromous salmonid populations in the Upper Cowlitz River basin. These efforts include ensuring the effective passage of juvenile salmonids during their migration downstream from the Upper Cowlitz and Cispus rivers, through collection in the Cowlitz Falls Fish Facility (CFFF), and transport around Tacoma hydroelectric facilities, where they are subsequently returned to the Cowlitz River.

The CFNSC was added to the existing fish collection system at Cowlitz Falls Dam in 2017 and has been subject to annual performance evaluations since commissioning. Annual evaluations of the fish collection system include estimates of fish collection efficiency (FCE), defined as the percentage of marked fish released at the head of Lake Scanewa that are subsequently collected alive at the CFFF. Fish passage survival (FPS) is FCE further adjusted to account for mortality throughout the process from capture at the CFFF, transport, and successful release out of the stress relief ponds at the barrier dam. FPS has a performance requirement of 95%, with a minimum of 75% after the best available technology has been deployed. Since the completion of Cowlitz Falls Dam in the late 1990's, FPS performance goals have yet to be met for Coho Salmon, steelhead, or Chinook Salmon, although estimates have improved significantly with the commissioning of the CFNSC.

Alternative tagging strategy:

A key component of FPS is the FCE estimate. TWG has discussed additional methods to estimate weekly FCE, including considerations for weighting weekly recapture estimates by the total number of outmigrants collected at the CFFF and the effects of any changes as they relate to recovery efforts at a population level. Washington Department of Fish and Wildlife (WDFW) has offered to develop an alternative study design for Coho and Chinook Salmon and steelhead FCE performance monitoring that considers increasing the frequency of mark-release events and extending the performance monitoring periodicity. In 2024, a new tagging strategy recommend by WDFW was employed by releasing 50 tagged fish of each species twice per week (outside the peak Coho Salmon migration), in addition to the historical methodology (1 weekly release of $n \approx 100$ per species during peak Coho Salmon migration). Preliminary analysis indicates this strategy may better inform early and late season FCE, as well as produce more data to better model the effects of operational covariates. This work will be done, at least in part, using an estimation model that accounts for outmigration rates in order to reduce bias in estimates of FCE. This tagging scheme and associated analysis will continue into future outmigration seasons until all parties and associated committees feel enough data has been collected to come to a consensus on effectiveness of the strategy.

Cowlitz Falls North Shore Collector Acoustic Tagging Study:

Continued evaluation of fish behavior and system performance is pivotal to increase FCE and FPS in this system and to ultimately meet FERC license requirements. To best assess the performance of the CFNSC, another iteration of a three-dimensional fish movement and behavior study using a network of PIT tag arrays and acoustic telemetry receivers is necessary to evaluate facility improvements that may improve juvenile collection especially for Chinook Salmon. The overarching goals are three-fold: 1) determine how operational adjustments are influencing outmigrating Chinook Salmon during the discovery, entry, and retention phases of the passage process, 2) model how environmental and operational covariates impact this performance, and 3) synthesize data into an adaptive management strategy to improve FCE and FPS. A block study design will be used to assess how CFNSC input flow impacts Chinook Salmon time to-event metrics, passage efficiencies, FCE, and FPS through time. Input flow will be artificially increased with two different strategies: 1) an occlusion plate to physically block a portion of the trash rack at the entrance of the CFNSC and 2) tailrace discharge that will incrementally open one or more of the CFNSC tailrace spill gates. Test input flows will range from the current operating flow of 500 cubic feet per second (cfs) operation (the control treatment) to 750 cfs for the two alternative treatments.

Coho Parr downstream as a passage:

Coho Salmon parr collection has increased since the commissioning of the CFNSC in 2017. On average, approximately 20,000 parr are collected each year (range = 8,335 – 58,743). These fish have historically been transported upstream above Cowlitz Falls Dam (Table 1); however, little is known of the ultimate success of this management practice or whether survival to smolt and the resulting smolt-to-adult ratio (SAR) would be increased by transporting and releasing parr downstream below the Barrier Dam. To evaluate best management practices, a literature review and study designs were proposed. Research over the last 50 years has revealed that their life history strategy is quite complex and the age at emigration and the use of estuarine habitat by juveniles vary. Studies have shown that there are two strategies used by Coho Salmon juveniles: 1) nomadic behavior, where fry or parr migrate back and forth from brackish estuaries and freshwater streams, and 2) resident behavior, where parr remain in freshwater until migrating out to estuaries in the spring as smolts. The decision to begin transporting these fish downstream was made by consensus and has the full support of the TWG and M&E. Discussions around evaluation criteria will continue to be a topic for these subcommittees moving forward and a refined recommendation will be presented to FTC at a later date. Coho Salmon fry are being intentionally left off the scope of this decision document; however, their downstream transport could be considered in the future.

Release Site	Basin	Number of Coho Salmon Parr				
		2020	2021	2022	2023	2024
23rd Crossing	Cispus	771	6680	3594	457	
28 Rd. Bridge Cispus	Cispus		841		3370	
Camp Creek	Cispus				203	
Copper Canyon	Cispus					203
Cowlitz at Shady Acres	Cowlitz		3882			
Cowlitz Falls Campground Boat Launch	Cowlitz				64	
Day Use Park	Scanewa	403	1995	53	3827	1224
Greenhorn Creek	Cispus			13		23
Hall Creek	Cispus			919	45	
Iron Creek	Cispus				1	24
Jody's Bridge	Cowlitz	54				
Johnson Creek	Cowlitz				11	
Kiona Creek	Cowlitz	229	551	757	187	99
Lake Creek	Cowlitz		1082	2	606	588
North Fork Cispus	Cispus	1017	2564	2618	4401	3852
North Fork Cispus Campground	Cispus	1	5919	3351	1277	
Quartz Creek	Cispus				83	52
Scanewa Debris Barrier	Scanewa			37	18	482
Siler Creek	Cowlitz	4353	3992	1086	1405	680
Skate Creek	Cowlitz		4450	2985	2993	1578
Tower Rock Campground	Cispus			30	2	
Upper Siler 2304	Cowlitz	1283	23946	105	47	
Woods Creek	Cispus	2047	4048	2191	810	308
Yellowjacket Creek	Cispus	893	122	45	558	1694
Total		11051	60072	17786	20365	10807

Table 1. Upstream release locations for Coho Salmon parr (2020-2024).

Coordination Need

Continue information sharing and development of Coho Salmon parr performance monitoring study designs with TWG and M&E. Bring forth a refined study design to the FTC.

Summary of Potential Impacts

1. Spring Chinook Salmon, Coho Salmon, and steelhead smolt abundance is expected to be sufficient for FCE evaluation. Annual performance evaluations involving tagging and releasing of smolts upstream of Cowlitz Falls Dam are not expected to be impacted by failure to reach minimum sample sizes for statistically valid results.
2. The CFNSC acoustic tagging study will determine how operational adjustments are influencing outmigrating Chinook Salmon during the discovery, entry, and retention phases of the passage process. FCE may vary based on treatment and could be impacted.
3. The Coho Salmon parr downstream passage strategy will eventually lead to insight into overall SARs and distributions of returning fish. There will also be a net benefit from an operational standpoint as transporting parr downstream with the smolts will require less effort than transporting them upstream.