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July 17, 2025

Maryalice Fischer
Certification Program Director
Low Impact Hydropower Institute
68 Harrison Ave Ste 605 PMB
Boston, MA 02111-1929
Sent via email to comments@lowimpacthydro.org

RE: Wells Dam project comments

Dear Ms. Fischer,

Thank you for the opportunity to comment on the Low Impact Hydropower Institute's (LIHI) certification application for Wells Dam submitted by Public Utility District No. 1 of Douglas County (DPUD). WDFW appreciates LIHI's willingness to reset the certification process so that all relevant and interested parties have the opportunity to comment.

WDFW recognizes the value of hydropower in Washington as a renewable and relatively climate friendly energy source for our state and Pacific Northwest. We also appreciate the role LIHI plays nationwide in recognizing and rewarding dams that minimize their environmental impact. Such recognition is most valuable where dams and their operators are held to and are meeting the highest environmental standards and are compatible with healthy and abundant populations of native fish. It is difficult to understand how any mainstem Columbia River Dam is meeting the highest environmental standards, including Wells Dam. Environmental commitments identified for Wells Dam represent negotiated standards, but not necessarily the highest standards based off contemporary information. New information suggests that changes to some environmental commitments are now needed to benefit native fish.

Comments made in our letter to LIHI dated November 15, 2024 and March 12, 2025 joint letter with the Yakama Nation and Columbia River Inter-Tribal Fish Commission still largely represent WDFW's concerns with respect to the Wells certification application. However, provided below are some additional and supplemental comments that are the result of additional application review and analyses performed by WDFW staff.[1]

[1] WDFW is also broadly in agreement with the technical comments submitted by the Yakama Nation for the current comment opportunity, which go into significant detail on the needs of certain species WDFW does not cover here, such as Pacific lamprey.

SUPPLEMENTAL COMMENTS

Criterion C – Upstream Fish Passage

Adult Upstream Passage and Survival

Adult passage survival has not been directly measured in the Wells Project Area or other hydro projects in the Upper Columbia for Plan Species (i.e., salmon and steelhead). Instead, the use of PIT tag detections to estimate conversion rates from fish ladders in Rocky Reach Dam to Wells Dam has been reported by DPUD (Anchor QEA and DCPUD 2025). This adult survival estimate does not include the migration and/or delayed mortality through the 48 km of reservoir, 24 km of the Okanogan River and 2 km of the Methow River that encompass the Wells Hydroelectric Project Area. PIT tag conversion rates, as calculated, do not represent a surrogate survival estimate because only the tailrace (1 km) was included, which represents < 2% of the project area. A surrogate survival rate would also assume the conversion rate is related to the actual adult survival rate. While DPUD stated survival within the Rocky Reach reservoir should be like Wells reservoir, no studies have been conducted or proposed to verify this assumption. In summary, conversion rates as currently calculated do not represent actual upstream adult passage survival due to the exclusion of the forebay and reservoir including direct, indirect and delayed mortality (Anchor QEA and DCPUD 2025).

> "Douglas PUD has no reason to expect that the Wells Project-related conditions facing adult fish in the Wells Reservoir would differ substantially from those experienced in the Rocky Reach Reservoir, which is included in the reported conversion rates." – p. 12

Criterion D – Downstream Fish Passage

Adult Steelhead Downstream Passage (Fallbacks) and Survival

Due to variability in juvenile steelhead PIT tag rates and ocean survival over time, fish were pooled across years, but annual averages are also reported when possible (Table 1). We fit a binomial generalized linear mixed model (GLMM) to predict the probability of detecting a fish in the Entiat watershed (0/1) as a function of Wells Dam passage and deviation from median passage date at Rocky Reach Dam, with a random intercept for capture year to account for unexplained annual variation. Model selection based on Akaike Information Criteria (AIC) showed that the most parsimonious model included only Wells Dam passage (plus random year effects), implying that passage date had little effect on Entiat detection. In that model, fish detected at Wells Dam had an estimated detection probability of 0.66 (95% CI: 0.58–0.74), whereas those not detected at Wells Dam showed a 0.96 (95% CI: 0.92–0.98) detection probability in the Entiat reach (Table 2). Because overshoot steelhead typically migrate downstream to their natal watershed in the fall (Fuchs et al. 2021), it is unknown if the difference between these groups was due to poor conditions in Wells reservoir (See Upstream Fish Passage) or the lack of a downstream surface passage route requiring steelhead to migrate through the turbines and experience higher mortality rates (Murdoch et al. 2022).

The detection history of each adult steelhead in the Entiat River was examined to determine if passage above Wells Dam delayed migration into the spawning grounds. For comparison purposes only, steelhead that were only detected at PIT arrays other than the lower Entiat array (ENL) or fish that migrated into the Entiat River the year before spawning were excluded from the analysis. Entiat steelhead that were detected at Wells Dam had a mean (SD) detection date at ENL of 29 March (SD = 19 days) compared to 28 March (SD = 21 days) for fish not detected at Wells Dam. While the migration date at Rocky Reach and the lower Entiat River was very similar for both groups, the proportion of steelhead exhibiting a fall migration into the Entiat River for fish not detected at Wells Dam was 0.15 compared to 0.03 for steelhead detected at Wells Dam. Hence, the overshoot behavior may inadvertently be selecting against fall migrating steelhead presumably due to lack of a downstream surface passage route. Fuchs et al. (2021) did not detect a difference in survival between steelhead that overwintered in tributaries compared to the Columbia River, but maintaining diversity in adult migration timing is important due to impacts of climate change on water temperatures.

Table 1. Number of wild PIT tagged Entiat steelhead detected at Rocky Reach Dam, Wells Dam and the Entiat River.

Run Year	Number at Rocky Reach	Number at Wells	Overshoot Proportion	Number Detected in the Entiat	Proportion of Overshoots detected in the Entiat
2010	53	15	0.28	8	0.53
2011	49	20	0.39	13	0.67
2012	23	10	0.43	6	0.56
2013	34	15	0.47	14	0.93
2014	49	24	0.46	14	0.58
2015	48	27	0.57	19	0.68
2016	29	16	0.59	11	0.69
2017	6	3	0.60	2	0.67
2018	13	4	0.67	2	0.50
2019	13	7	0.54	4	0.71
2020	9	7	0.89	6	0.88
2021	2	1	0.50	1	1.00
2022	4	1	0.25	0	0.00
2023	2	0	0.00	0	0.00
2024	7	4	0.57	2	0.50
Pooled	341	154	0.45	102	0.66
Mean			0.48		0.60

Entiat steelhead were only required to migrate downstream through a single project (i.e., Wells Dam) to reach their natal watershed and only 69% returned to the Entiat subbasin compared to non-overshoot Entiat steelhead (0.66/0.96=0.69). Murdoch et al. (2022) reported that steelhead from the Snake River and Middle Columbia DPS were also commonly observed in the Upper Columbia DPS. Furthermore, except for observations at Priest Rapids Dam (first dam

encountered to be considered an overshoot), Wells Dam was the second most common location (~20%) overshoot steelhead were last observed. Of those fish, only 29% were observed downstream in their natal watershed, which required them to migrate through five dams (Table 3). However, after accounting for downstream passage survival at Priest Rapids (93.6%), Wanapum (93.6%), Rock Island (81.2%) and Rocky Reach (91.7%) dams (Murdoch 2023), the estimated project survival at Wells Dam was 72%, including known overshoot steelhead (N =13) that were observed in tributaries upstream of Wells Dam. In summary, overshoot fish from downstream populations (i.e., Entiat = 69% and Snake and Mid-Columbia = 72%) experience similar survival rates migrating downstream of Wells Dam.

Table 2. Summary of Entiat River steelhead detected at Rocky Reach Dam based on upstream migration route, 2010-2024.

Detection location	Total	Wells Dam Overshoot	
		No	Yes
Rocky Reach	341	187	154
Entiat	281	179	102
	82%	96%	66%

Table 3. Number of wild PIT tagged steelhead from the Snake and Middle Columbia DPS detected at Wells Dam.

Year	Wells Dam	Detected Downstream		Last Detection	
		Number	Proportion	Wells Dam	Above Wells
2010	4	1	0.25	3	
2011	4	3	0.75	1	1
2012	11	1	0.09	10	1
2013	9	2	0.22	7	1
2014	8	0	0.00	8	1
2015	8	3	0.38	5	
2016	4	1	0.25	3	1
2017	1	0	0.00	1	
2018	4	1	0.25	3	1
2019	4	1	0.25	3	3
2020	4	2	0.50	2	2
2021	3	3	1.00	0	
2022	3	2	0.67	1	1
2023	2	0	0.00	2	
2024	1	0	0.00	1	1
Pooled	70	20	0.29	50	13
Mean			0.31		

Criterion F – Threatened and Endangered Species

Overshoot steelhead downstream passage

Wells Dam does not currently have Endangered Species Act coverage for Snake River and Middle Columbia steelhead overshoots observed at or above the project . LIHI's Criterion F has not been met because of the lack of ESA coverage for Snake and Middle Columbia steelhead and perhaps also for upper Columbia steelhead due to the impact of overshoot mortality on the only steelhead DPS covered by the HCP.

Overshoot steelhead migrate downstream primarily in the fall when no spill is occurring, or bypasses are closed, and the only passage route is through the turbines. Analysis of PIT tagged overshoot steelhead consistently show ~ 30% of those fish are not observed the following spring in the Entiat River, which could be the result of mortality associated with overshoot steelhead attempting to fallback through the turbines. NMFS (2003) reported steelhead kelt mortality as high as 41% for turbine passage routes compared to 8% for spillways. Murdoch et al. (2022) estimated the average abundance of wild steelhead overshoots (i.e., Snake and Middle Columbia) at Priest Rapids Dam was 1,856 fish. Of those, 20% were estimated to pass at Wells Dam and resulted in 104 fish lost annually (1,856 x 0.20 x 0.28 = 104).

Using data on Entiat steelhead, 45% at Rocky Reach Dam pass upstream of Wells Dam in the fall and of those 30% are not observed in the Entiat the following spring. Hence, spring steelhead spawner estimates represent those fish that did not overshoot (0.55) and those that successfully migrated downstream of Wells Dam (0.45 x 0.70 = 0.315) or 86.5% of the potential number of spawners. Using the mean annual Entiat steelhead spawner abundance (N = 353; WDFW, unpublished data), the estimated number of steelhead lost to overshooting at Wells Dam was 55 fish.

Table 4. Estimated number of spawners and potential spawners if Entiat steelhead did not pass Wells Dam.

Run year	Estimated number of spawners *(X)*	Estimated potential number of spawners *(Y = X/0.865)*	Unknown loss *(Y-X)*
2010	695	803	108
2011	519	600	81
2012	243	281	38
2013	420	486	66
2014	583	674	91
2015	586	677	91
2016	238	275	37
2017	111	128	17
2018	147	170	23
2019	290	335	45
2020	412	476	64
2021	223	258	35
2022	235	272	37

2023	245	283	38
Mean	353	409	55

The Wells HCP (Section 4.4.5) calls for immediate actions if survival of overshoot fallbacks is determined to be significant. The mean wild steelhead passage at Wells Dam (2010-2024) was 2,591 fish based on a query from DART (available at: DART Adult Passage Counts Annual Summary for All Species | Columbia Basin Research). Of those fish, approximately 6.1% of the wild fish that pass upstream of Wells Dam are lost based only on the estimated mortality of overshoot steelhead (N = 159). While discussions have been ongoing related to overshoot steelhead, no interim protective measures at Wells Dam have been implemented.

Upper Columbia River Spring Chinook and Steelhead Recovery Plan

The recovery plan has specific goals for those listed species in the Upper Columbia River.

- To secure long-term persistence of viable populations of naturally produced spring Chinook and steelhead distributed across their native range.

- To secure long-term persistence of self-sustaining, complex, interacting groups of bull trout distributed across the native range of the species.

Objectives of the recovery plan include increasing the abundance and productivity of naturally produced fish while restoring the spatial structure and diversity of the populations. Presumably, because naturally produced ESA-listed species are not very abundant, DPUD has performed juvenile survival studies (approved by the Coordinating Committee) under the HCP, only using hatchery fish which are larger in size and have a shorter migration period than naturally produced fish. Juvenile PIT tagged wild spring Chinook have been detected at the Wells Project from October through the following spring (~ 8 months). Low PIT tag detection at the mouth of the Methow and Wells Dam has prevented the use of models to estimate wild fish survival in the Wells Project. Juvenile downstream passage is influenced not only by survival processes but also by hydro operations that affect movement rates and timing. Integrated models of survival, such as continuous time mark transition capture (CMTC) models, provide more accurate and unbiased estimates of survival because they explicitly account for where a fish was detected, when it was detected, and what condition or state it was in. By modeling survival and travel time as integrated processes, CMTC frameworks overcome the limitations of detection-only data, which are biased toward faster or more detectable individuals. This integration is especially important in sparsely monitored areas, such as between the Twisp River and Methow River traps and downstream locations like Wells Dam, where few detections make it difficult to distinguish between migration delays and mortality. However, even traditional Cormack-Jolly-Seber (CJS) models struggle in this context, as limited detections downstream of Wells and Rocky Reach dams can result in nonsensical survival estimates greater than one. In contrast, CMTC models are yielding new insights into survival and travel time for the Entiat and Wenatchee Rivers, where novel detection technologies provide sufficient data across the extended subyearling and yearling

migration periods. Without additional detections at Wells Dam, it is unlikely we will gain meaningful insight into how survival and migration timing are shaped by hydro operations in this segment of the river. The use of hatchery fish as surrogates for wild fish has not been evaluated before or after survival studies were conducted. As a result, uncertainty remains in the applicability of the results to naturally produced fish which is the focus of the recovery plan. Regardless, it is not apparent that even hatchery fish survival through the 5 mid-C dams to McNary Dam has increased over the last 25 years (Figure 1). This broad trend in survival is also consistent with a more recent trend in survival through the Wells Project Area to Rocky Reach Dam (Figure 2).

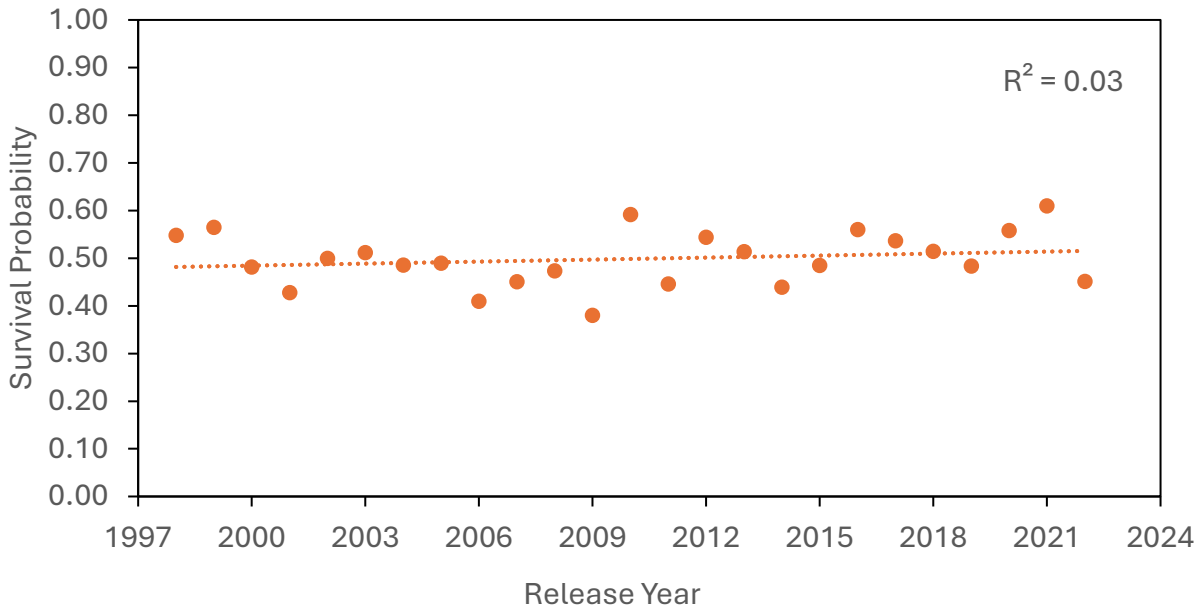

Figure 1. Trends in Methow hatchery spring Chinook survival (release to McNary Dam) from 1998 to 2023. Dotted lines denote linear trend.

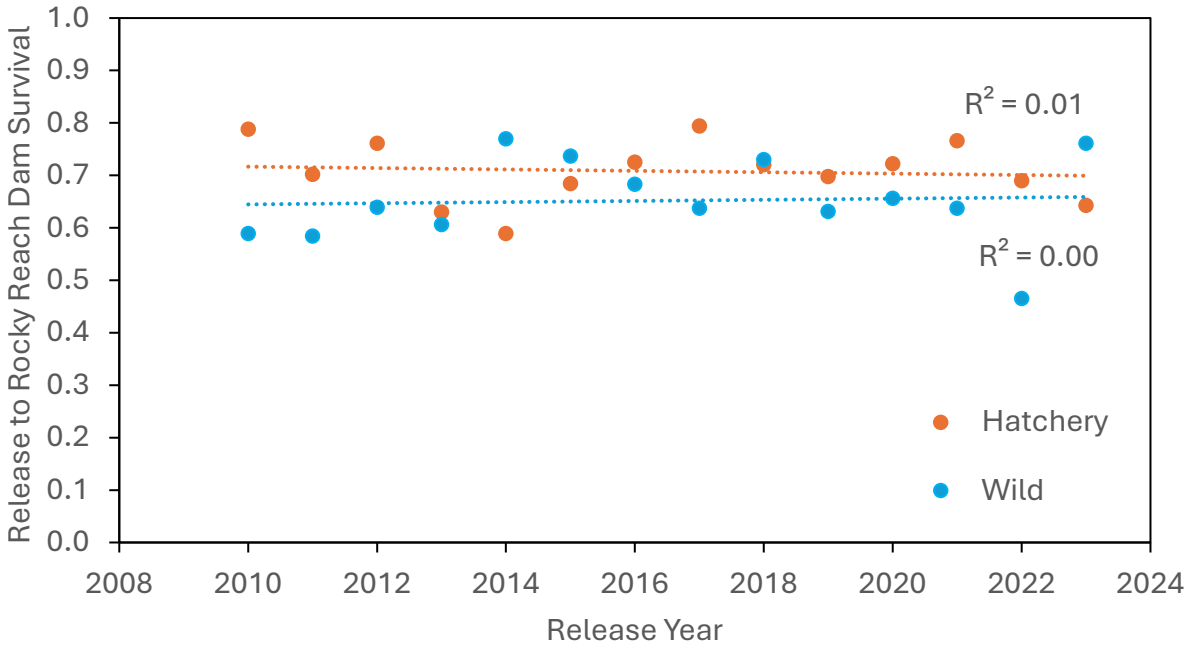

Figure 2. Trends in Methow hatchery and wild spring Chinook survival (release to Rocky Reach Dam) from 2010 to 2023. Dotted lines denote linear trend.

The Upper Columbia Salmon and Steelhead Recovery Plan (UCSRB 2007) also references a series of "Hydro Project Recovery Actions" or objectives, some of which are applicable to naturally produced spring Chinook and steelhead in the Wells Project Area – these actions and associated evaluations have not been completed.

<u>Relevant Hydro Project Recoveries Action (page 189)</u>

- Determine baseline survival estimates for juvenile spring Chinook and steelhead as they pass hydroelectric projects on the Upper Columbia River.
- Evaluate effects of hydroelectric projects on adult passage of spring Chinook, steelhead, and bull trout.
- Evaluate if passage through hydroelectric projects affect spawning success or fitness of spring Chinook, steelhead, and bull trout.
- Evaluate effectiveness of predator control programs.

WDFW has been and remains committed to working through the adaptive management and new information clauses in the HCP in a collaborative fashion to identify meaningful changes that benefit native fish. That said, adaptive management under the HCP needs to become truly adaptive and significantly more agile if it is to meet the challenges faced by Endangered Species Act-listed Upper Columbia River spring Chinook and summer steelhead. WDFW noted in previous comments submitted along with those from the Yakama Nation and Columbia River Inter-Tribal Fish Commission (see link above) that if LIHI could require significant new enforceable conditions, certification could serve as a means to bring Wells Dam up to a level that could potentially merit certification. However, even if DPUD were willing to adopt such conditions, this would require LIHI to function as a quasi-regulatory agency, which appears to be beyond the scope of LIHI's current mission and capacity.

Thank you for consideration of our comments. Please direct any questions or requests for follow up conversations to Michael Garrity at 360-810-0877 or Michael.Garrity@dfw.wa.gov.

Sincerely,

Kelly Susewind
Director

References

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