



# Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway • East Wenatchee, Washington 98802-4497 • 509/884-7191 • FAX 509/884-0553 • [www.douglaspud.org](http://www.douglaspud.org)

**Via Electronic Filing – [mfischer@lowimpacthydro.org](mailto:mfischer@lowimpacthydro.org)**

Maryalice Fischer  
Certification Program Director  
Low Impact Hydropower Institute  
68 Harrison Ave. Ste. 605 PMB  
Boston, MA 02111-1929

January 15, 2025

**Subject: Wells Hydroelectric Project – FERC Project No. 2149  
Response to Comments regarding Wells LIHI Certification Application**

Dear Ms. Fischer:

The Public Utility District No. 1 of Douglas County (Douglas PUD), owner and operator of the Wells Hydroelectric Project (Wells Project), respectfully submits to Low Impact Hydropower Institute (LIHI) comments and clarification in response to letters sent to LIHI by Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), Washington Department of Fish and Wildlife (WDFW), and Columbia River Inter-Tribal Fish Commission (CRITFC) (herein commenting agencies or CA). CA's comment letters were sent in response to the Wells Project LIHI certification application.

Given the important, longstanding, and positive working relationships between Douglas PUD, WDFW, and the Yakama Nation, we were surprised by the tone and number of negative comments in the CA's letters. We also strongly disagree with the assertion made in the letters that Douglas PUD is not working collaboratively to address the effects of the Wells Project on anadromous and resident fish, including Pacific Lamprey. Douglas PUD believes that the letters do not accurately depict the status of these issues, which are being actively discussed and assessed through engagement in monthly natural resource stewardship meetings. After a review of these letters, Douglas PUD has identified several incomplete, inaccurate, or misleading statements that we hope can be clarified through the disclosure of the collaboratively developed and implemented studies, meeting minutes, and statements of agreements that are associated with the four main areas of CA's comment letters. Douglas PUD have packaged the factual public record supporting our collaborative resource protection efforts into four supporting documents (Attachment A-D) because of the level of detail required to address these comments. Douglas PUD hopes this response letter will demonstrate Douglas PUD's commitment to environmental stewardship by not only meeting but exceeding the Wells Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP) survival and passage standards for anadromous fish species and its long-standing commitment to enhancing natural resources beyond the FERC license requirements for the Wells Project.

In terms of collaboration and adaptive management, Douglas PUD's Natural Resource Staff and technical leads representing the National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), Washington Department of Ecology (Ecology), WDFW, Yakama Nation, and the Confederated Tribes of the Colville Reservation (CTCR) meet monthly in at least four different forums: The HCP Coordinating Committee (HCP CC), the HCP Hatchery Committee, the HCP Tributary Committee, and the Aquatic Settlement Workgroup. The HCP and Aquatic Settlement Agreement (ASA) processes are adaptive management proceedings that create a forum where all party's issues are equally respected and fully vetted. These processes work best when they are open, transparent, and well-documented. These forums have created a venue for technical dialogue and scientific debate and, ultimately, require compromise. This is especially true for new and emerging topics where limited scientific information is available or is not easy to collect due to the complexity of life histories exhibited by target fish species, limitations of tag detection technology, or the fact that the Wells Project is located on a large, dynamic river system.

Although some debate exists around the status of several of these new and emerging topics, the Wells HCP's No Net Impact (NNI) status for the Wells Project is clear and well documented. The Wells Project has been unanimously documented to be achieving the NNI standards for all five HCP Plan Species (both Endangered Species Act listed and non-listed salmonids). The HCP CC has unanimously approved the Wells Project's achievement of the juvenile and adult survival and project passage standards. This unanimous decision was affirmed most recently with the successful completion of the 2020 Survival Verification Study (Gingerich et al. 2020<sup>1</sup>) and the December 2024 approval of the 10-year Comprehensive NNI Report (Douglas PUD 2024<sup>2</sup>). Yakama Nation and WDFW staff have reviewed, edited, and approved both of these documents.

Similarly, the 2023 Pacific Lamprey Management Plan Report was reviewed, edited, and approved by both the Yakama Nation and WDFW in early 2024. From Douglas PUD's perspective, the issues presented by CAs should be viewed through the following lens: Phase III standards achieved for all HCP Plan Species, along with steady and reasonable progress for Pacific Lamprey in the upper Columbia River above Wells Dam.

Within the Committees, the issues raised by the CAs are being discussed and analyzed, and as applicable, study plans are being prepared to try to document whether or not the Wells Project impacts, as alleged by the CA, are present at Wells Dam. Douglas PUD looks forward to continuing to work with the Yakama Nation and WDFW on the best way to measure and, if impacts are present, minimize the asserted impacts. We cannot, however, short-circuit the adaptive management processes

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<sup>1</sup> Gingerich, A., S.A. Bickford, T. Kahler, J.R. Skalski, R.L. Townsend, R. Richmond and S. Anglea. 2020. Project Survival Estimates for Yearling Chinook Migrating through the Wells Hydroelectric Project, 2020. Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802 – 4497.

<sup>2</sup> Douglas PUD. 2024. 2024 Comprehensive Progress Report: Status of Achieving NNI Under the Anadromous Fish Agreement and Habitat Conservation Plan. Wells Hydroelectric Project. HCP CC Approved December 20-27, 2024. 1151 Valley Mall Parkway East Wenatchee, WA 98802.

(see HCP and ASA agreements) by moving straight to mitigating for alleged impacts that have not been measured, quantified, or agreed upon by all of the HCP and Aquatic Settlement parties.

Douglas PUD has a history of working collaboratively to minimize the Wells Project's environmental impacts. Douglas PUD assumes that this forward-looking environmental stewardship is consistent with the LIHI's mission. In the spirit of collaboration and stewardship, Douglas PUD has included a series of suggested conditions that could be assigned to the Wells Project's LIHI certification to ensure that these important issues are addressed in a timely manner, within the existing forums:

- 1) Douglas PUD will be required to provide LIHI with an annual update on the proposed steelhead overshoot and fallback study, including status updates on the development of a study plan, field efforts, and final reports documenting adult steelhead interaction with the Wells Project.
- 2) Douglas PUD will be required to annually provide LIHI with a copy of the HCP CC Annual Report documenting the status of subyearling Chinook studies at the Wells Project. The Annual Report will include all subyearling Chinook study-related documents that Douglas PUD shares with the HCP CC, including any future planned, ongoing, or completed subyearling Chinook life-history or survival studies.
- 3) Douglas PUD will provide LIHI with an annual update on the status and adjusted operational timing of the juvenile fish bypass system and passage dates analysis report.
- 4) Douglas PUD will provide LIHI with an annual update on the status and ongoing improvements to the PIT tag detection at the Wells Project.
- 5) Douglas PUD will provide LIHI with annual updates on the progress towards improving PIT tag detection on the lower Methow River, including the Methow River Train Bridge.
- 6) Douglas PUD will provide LIHI with a 2025/2026 Lamprey Radio Telemetry Report once approved by the Aquatic SWG
- 7) Douglas PUD will provide LIHI with an annual summary showing updated Pacific Lamprey counts at the Wells Project.
- 8) Douglas PUD will be required to provide LIHI with an annual summary of juvenile lamprey screw trap counts, where available, in the Okanogan, Methow, and Twisp River Basin.

In addition to the regular and routine committee processes, Douglas PUD maintains positive and collaborative working relationships with WDFW related to implementing several environmental enhancement projects that are not part of Douglas PUD's FERC license requirements. These projects are intended to conserve, enhance, and restore the aquatic and terrestrial resources found within or adjacent to the Wells Project. Examples include providing off-license funding in excess of \$300,000 per year for the operation of the Wells Wildlife Area and providing WDFW with 20,000 pounds of rainbow trout each year towards the enhancement of recreational fishing within Okanogan, Douglas, and Chelan counties (Douglas PUD 2007<sup>3</sup>). Douglas PUD and WDFW are also collaborating, outside

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<sup>3</sup> Douglas PUD 2007. Office License Settlement Agreement Resident Fish Stocking and Wells Wildlife Area Funding. An Agreement Between the Washington State Department of Fish and Wildlife and the Public Utility District No. 1 of Douglas County. Wells Hydroelectric Project FERC Project No. 2149

the FERC license to rear 1,000,000 juvenile Chinook salmon per year and towards supplementing the prey base for Southern Resident Killer Whales (SRKW; see below).

Douglas PUD's record of supporting aquatic resources goes above and beyond the impact minimization and mitigation requirements contained within the Wells HCP, ASA, and the Federal Regulatory Commission (FERC) license for the Wells Project. Unlike many other hydro project license requirements, the HCP and ASA contain robust, adaptive, collaborative, and holistic environmental stewardship approaches compared to the more traditional Section 7 Endangered Species Act (ESA) consultations utilized for hydro throughout the Columbia River Basin. For example, the Wells HCP does not simply provide an ESA Section 7 Incidental Take Statement for listed spring Chinook and steelhead interacting with the Wells Project. Instead, the Wells HCP is an ESA Section 10 HCP intended to protect, conserve, and enhance all five populations of anadromous salmon and steelhead regardless of each population's ESA-listing status. That means that non-ESA-listed sockeye, summer and fall Chinook, and Coho are protected with the same high NNI survival and passage standards as ESA-listed spring Chinook and steelhead. It should also be noted that the HCP was not something that the FERC required of the licensee at relicensing, but instead, Douglas PUD and its HCP partners actively advocated for the HCP and its NNI survival standards to be incorporated into the new FERC license for the Wells Project.

Another example of Douglas PUD going above and beyond its license requirements, is its ongoing support for recovering ESA-listed SRKW. Each year, for the past several years, Douglas PUD has agreed to rear 1,000,000 subyearling Chinook at the Wells Hatchery. This program not only benefits SRKW but also provides additional harvestable fish for commercial, recreational, and tribal fisheries. Programs like this, which are not required to mitigate hydro impacts but instead provide regional benefits well outside the Wells Project boundary and provide significant recreational and tribal harvest opportunities, should be considered during the LIHI certification process.

Additionally, since 2019, Douglas PUD has been supporting both Phase I and Phase II of the Upper Columbia United Tribes (UCUT) mission to study the feasibility of reintroducing salmon above five hydroelectric dams that currently block anadromy following successful passage of the Wells Project. Wells Dam is the 9<sup>th</sup> and last dam on the mainstem Columbia River that offers both upstream and downstream passage features for Pacific Salmonids and Pacific Lamprey. Douglas PUD has been an active proponent of the UCUT's efforts for five years, long before regional acceptance of the UCUT's reintroduction programs. Examples of this steadfast support include providing a source of surplus adult fish from Wells Hatchery to UCUT member tribes for ceremonial and subsistence releases into the blocked area, providing an in-hatchery location for adult holding for disease testing, and sharing access to Douglas PUD's acoustic telemetry receiver network to study adult fallback of Chinook released into the blocked area.

At the request of UCUT, and during the first years of the Phase 2 Implementation Plan (more commonly referred to as P2IP), Douglas PUD has been rearing 160,000 juvenile Chinook salmon annually at the Wells Hatchery. The Upper Columbia member tribes use these fish to study the survival and behavior of juvenile salmon in the blocked area. In the spring of 2024, and at the request

of several Upper Columbia tribes, Douglas PUD installed an adult return “sort by code” PIT-tag detection feature in the Wells Hatchery Adult Return and Sorting Building to identify returning P2IP blocked-area fish. This system will enable the UCUT to identify, capture and re-patriate their blocked area adult fish returning from the ocean. To our knowledge, Douglas PUD is the only public utility district in the state of Washington actively supporting these two important efforts (SRKW and P2IP).

Like the SRKW and P2IP programs, many other adaptive aquatic resource actions and examples exist. Some of these are discussed in more detail in Attachments A-D. Douglas PUD hopes the information in this letter and associated attachments will better inform the LIHI certification process. Likewise, this response aims to demonstrate Douglas PUD’s ongoing commitment to the conservation, restoration, and enhancement of the fish, wildlife, and water quality resources associated with the Wells Project. Douglas PUD remains committed to working collaboratively with all of our regional stakeholders, including WDFW, Yakama Nation, and CRITFC, to further understand and, where appropriate, minimize or mitigate the impacts of the Wells Project.

If you have any questions or require further information, including copies of specific citations or references provided in our detailed responses, please feel free to contact me at (509) 881-2208, [Shane.Bickford@dcpud.org](mailto:Shane.Bickford@dcpud.org) or Andrew Gingerich at (509) 881-2323, [Andrew.Gingerich@dcpud.org](mailto:Andrew.Gingerich@dcpud.org).

Sincerely,



Shane Bickford  
Assistant Manager – Natural Resources and Dam Safety

Attachment A.	Adult Steelhead Overshoots
Attachment B.	Juvenile Migration, Survival and Passage Timing
Attachment C.	Subyearling Chinook Salmon
Attachment D.	Pacific Lamprey

Cc: Gary Ivory – Douglas PUD  
Jeff Johnson – Douglas PUD  
Cait O’Reilly – Douglas PUD  
Andrew Gingerich – Douglas PUD  
Tom Kahler – Douglas PUD  
Mariah Mayfield – Douglas PUD  
John Rohrback – Douglas PUD  
Amber Nealy – Douglas PUD

**WELLS HYDROELECTRIC PROJECT  
FERC PROJECT NO. 2149-WA**

**ATTACHMENT A**

**ADULT STEELHEAD OVERSHOOTS**

## Adult Steelhead Overshoots

In the comments submitted to the Low Impact Hydropower Institute (LIHI) regarding Public Utility District No. 1 of Douglas County (Douglas PUD)'s application for certification, the Washington Department of Fish and Wildlife (WDFW), the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), and the Columbia River Inter-Tribal Fish Commission (CRITFC) all raised the issue of adult fish downstream passage at Wells Dam. Specifically, commentors mention steelhead overshoots and assert that operations at the Wells Hydroelectric Project (Wells Project) do not support the safe downstream passage of adult steelhead from downstream populations because they lack structured time-windows of fall and winter surface spill. Douglas PUD shares a concern for the wellbeing of Columbia basin steelhead and is committed to understanding the problem and implementing a meaningful and suitable resolution. To that end, the issue of steelhead overshoots is currently a recurring topic on Wells Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP) Coordinating Committee's (CC) monthly meeting agendas, where Douglas PUD and other participating HCP Parties are actively working towards an effective solution. As WDFW points out, this is still an emerging topic. Being "relatively new and [derived] from recent science," it should not be surprising that there are still unresolved questions as to the severity of the issue or the appropriate remedy. Nonetheless, the potential difficulty of overshoot steelhead to safely and voluntarily make downstream passage of Wells Dam is an emerging and potentially serious concern to both fish managers and Douglas PUD. As such, Douglas PUD looks forward to the continued scientific exploration alongside all members of the HCP including those represented by the Yakama Nation and WDFW.

As a more complete understanding of the issue emerges by way of new science and discovery, Douglas PUD is prepared to take appropriate actions to maintain compliance with its mitigation obligations. Moreso, as it has done before, Douglas PUD is willing to go beyond its obligations when doing so can ensure the protection of the natural resources and anadromous fish stocks, which are of immeasurable cultural and ecological value to the Columbia River Basin. The comments related to steelhead overshoots provided by WDFW, Yakama Nation, and CRITFC are reflective of ongoing discussions within the monthly Wells HCP CC. As this process of study and discussion is carried out in venues established by the HCP for the Wells Project, it is natural for various parties to disagree on particular matters. In our response to these comments, Douglas PUD has two goals. The first is to inform LIHI of the complexities, uncertainties, and unresolved questions surrounding the issue that were not described in the comment letters, but that have thus far led to an inability of the HCP CC to fully understand the steelhead overshoot issue as necessary to allow for the identification and implementation of reasonable and effective operational changes at the Wells Project should they need to occur. The second is to describe actions Douglas PUD is currently undertaking to gain that information necessary to identify and implement appropriate steps to address the issue of steelhead overshoots alongside those HCP CC members.

There are several points of contention and areas of uncertainty among HCP participants that WDFW, Yakama Nation, and CRITFC<sup>1</sup> describe in their comments to LIHI. These include the

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<sup>1</sup> CRITFC is not an HCP participant. However, Yakama Nation, a CRITFC member tribe, is.

degree of threat to which steelhead populations contributing overshoots at the Wells Project are subjected; the rates of fallback success of overshoot steelhead at Wells Dam; and the ability to differentiate between an unsuccessful overshoot steelhead, naturally-occurring strays, natural overwinter mortality, and fish that succumbed to lawful or unlawful fishery, or those that returned downstream successfully but without subsequent detection.

WDFW's comments begin by asserting that Douglas PUD's LIHI application mischaracterizes the magnitude of threat to Columbia and Snake River steelhead populations presented by what it purports is a lack of "safe downstream passage... through Wells Dam." The magnitude of the threat that faces populations from which steelhead overshoot is, as WDFW points out, a question to which a consensus has not yet been reached. In an attempt to better understand the degree of threat, Douglas PUD conducted an analysis of the detection histories of returning adult Snake River-origin steelhead that were PIT-tagged as juveniles at Lower Granite Dam (in the Snake River Basin), and shared the results of this analysis with the HCP CC in June 2023 (Douglas PUD 2023). Fewer than one percent (0.6%) of sampled PIT-tagged steelhead originating within the Snake River basin have a final detection at or above Wells Dam. These results are similar to what other investigators have reported (Crozier et al. 2021). With data gathered to date, Douglas PUD contends that with 0.6% of a stock having a last PIT-tag detection above the Wells Project and without accounting for natural stray rates, natural overwinter mortality, and lethal removal from lawful and unlawful fisheries, the Wells Project's effect on the Snake River DPS is most likely to be "low impact" if impactful at all. Whether the phenomenon of overshooting by downstream-originating steelhead is likely or not likely to jeopardize ESA-listed natal populations is a question for other agencies to answer in venues separate and apart from LIHI certification. But in the meantime, Douglas PUD continues to review the best available data, take actions to expand the knowledge base, and engage in discussions with the HCP CC members to further understand the severity of the issue. Once the tools and studies that could be employed to answer key questions have been identified, effective actions to clarify and reasonably address any outstanding problems will be implemented. Douglas PUD's view is that this process is in the early stages, rather than having definitively and appropriately described what effect the Wells Project has on this stock as claimed by the commentors.

Regarding downstream passage across mainstem Columbia hydroelectric projects in the upper Columbia region, WDFW goes on to posit that "Wells Dam [has] the lowest success rate (50.1%) compared to other hydroelectric projects (which ranged from 81.2 – 91.7%)."<sup>2</sup> This assertion is based on an analysis of adult steelhead PIT-tag-detection histories conducted by WDFW staff that was presented to the Wells HCP CC in February 2023 (see slide 11 of attached presentation and February 2023 HCP CC meeting minutes). PIT tags are useful and important tools for monitoring and evaluation of anadromous fish species throughout the Columbia River Basin, but they are an unsuitable tool for measuring downstream passage rate success of adult steelhead that have

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<sup>2</sup> It is not entirely clear, based on WDFW's comments, what exactly qualifies as "success" in downstream passage, but it appears as if success is defined by a PIT detection at a location downstream of Wells Dam. Failure appears to be anything else, including successful spawning in a tributary upstream of Wells Dam, collection in a WDFW-sponsored recreational fishery, successful downstream passage across Wells Dam and natural overwinter mortality outside of the Wells Project area, or any other outcome.



ascended Wells Dam. This is because there is virtually no detection of PIT-tagged adult steelhead as they make a downstream passage of mainstem Columbia River hydroelectric projects either via surface spill or a turbine route, and a successful downstream passage event cannot be discerned unless a fish is detected at a PIT tag array downstream of the project. Generally, such a detection would occur when a PIT-tagged steelhead reascends a downstream dam or enters a downstream tributary. Wells Project is implicated as an impediment to successful fallback of overshoot steelhead, but a more accurate interpretation of the data is that Wells Dam is the site of final PIT-tag detection for some easily quantifiable proportion of fish. WDFW's conclusion that overshooting steelhead at the Wells Project have a 50.1% fallback success rate relies on PIT-tag-detection histories that are incapable of revealing whether a steelhead attempted, successfully or otherwise, to make a downstream transit of Wells Dam. Furthermore, WDFW's analysis on steelhead fallback success rates at the Wells Project includes fish that experienced natural overwinter mortality or were harvested in recreational and tribal fisheries upstream of the Wells Project in their estimate of unsuccessful fallbacks. WDFW failed to provide this important context to LIHI in its comments responding to Douglas PUD's application for LIHI certification. A 50% rate of overshooting PIT-tagged steelhead not detected downstream of the Wells Project should not be confused with the best available science on fallback success. Neither does it imply steelhead mortality for non-detected fish. Rather, it is a coarse placeholder estimate of last known location procured from limited data generated by an unsuitable tool, waiting to be replaced by more informative data that could be gathered from an active-tag (i.e., radio or acoustic tags) study focused on answering questions related to the overshoots issue<sup>3</sup>. A suitable tool would allow the identification of passage attempts, forebay and tailrace detection, and discern successful or unsuccessful passage. Moreover, when conducting empirically driven research, no study is complete without the identification of appropriate controls (group or groups). PIT-tag detections of one population originating below the Wells Project lacks an appropriate control group. Future study should attempt to identify appropriate controls, which might include steelhead native to tributaries above Wells. Interpreting behavioral data and determining a fish's intent is tremendously difficult, and especially so without the identification and application of an appropriate control group.

Both CRITFC and Yakama Nation contend that Douglas PUD is unauthorizedly taking<sup>4</sup> steelhead from downstream ESA-listed populations. Commentors do not define the mechanism by which an overshoot steelhead would be taken or how that take could be quantified, but the implication is that take is generated by the lack of a systematic surface spill regime in the fall and winter months. Contrary to the commentor's assertion, Douglas PUD is confident that no such take exists. Ultimately, the determination of whether or not take is occurring in this instance is the

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<sup>3</sup> Fuchs and Caudill (2018), specifically Appendix C, highlights WDFW shortcomings in their letter referencing PIT-tag histories. In this study adult steelhead were both PIT tagged and radio tagged. Appendix C reveals very different outcomes by the higher resolution radio tags than what could be achieved with PIT tags alone, and therefore points out the problems with WDFW's interpretation of last known PIT tag detection summaries at Wells Dam driving concerns related to Snake River overshoots.

<sup>4</sup> Under Section 9 of the ESA, it is illegal to import, export, or take endangered species for any purpose, including commercial activity. The term "take" means to harass, hunt, shoot, capture, trap, kill, collect, wound, harm, or pursue an ESA-listed species, or attempt any of these activities.

responsibility of the National Oceanic and Atmospheric Administration (NMFS or NOAA, the agency charged with ESA consultation and authorship of Biological Opinions rather than WDFW, CRITFC or Yakama Nation). Commentors left out an important point: in 2003 NMFS included in the Biological Opinion for the Wells Project the statement that "...the Project [Wells] likely has no effect or only negligible effect on this ESU" (referring to the Middle Columbia Steelhead ESU/DPS) (See 2003 Biological Opinion Section 2-1). Douglas PUD agrees with NMFS that the data shared and presented to date suggest that either no or negligible effect on this Evolutionarily Significant Unit (ESU) in question occurs at the Wells Project and as such the Wells Project is still "low impact" towards this ESU.

Absent from the comments submitted to LIHI is any mention of non-natal straying by steelhead or other anadromous fish. Straying is a natural phenomenon in which anadromous fish, which typically home to a natal stream, migrate to and attempt to reproduce in a non-natal location (Quinn 1993). Keefer and Caudill (2014) offer an extensive review of the topic and write that:

*...straying in wild populations is a critical evolutionary feature of salmonid biology that compliments homing.... Accumulating evidence suggests that a combination of predominantly philopatric individuals plus some strays makes for robust populations that can exploit favorable natal-site habitats, expand into new sites, and disperse in the face of temporary or catastrophic environmental fluctuations. Indeed, salmonids are increasingly considered in terms of metapopulations and connected by some degree of movement (i.e., straying) among populations.*

Recent research on steelhead straying from populations in the Upper Columbia shows that steelhead are more likely to stray in an upstream direction at relatively low rates (Pearsons and O'Connor, 2020). This is similar to the behavior that is currently observed in steelhead from middle Columbia River and Snake River populations that enter the upper Columbia and interact with the Wells Project. It is exceedingly likely that straying from the middle Columbia River and Snake River watersheds into the upper Columbia is a natural process, and that some or all of the steelhead overshoots may be more accurately classified as natural strays, which may not have even attempted to fallback below the Wells Project.

There are multiple factors that may influence a fish's propensity to stray, many of which are likely unknown. WDFW states that "steelhead overshoot their natal watersheds... most notably to seek thermal refuge" and goes on to argue that fish that ascend Wells Dam are hindered in their attempts to return downstream by Wells Project operations. This implies that water in the Upper Columbia, being cooler than that found farther downstream or in the Snake River basin, serves as a lure to an ecological trap.<sup>5</sup> An alternative interpretation could be that cool water from the Upper Columbia serves as a thermal refuge for temperature-stressed steelhead, which may then enjoy higher

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<sup>5</sup> WDFW asserts that the cool water of the Upper Columbia draws fish over Wells Dam in part because the Wells Project is "immediately downstream of Chief Joseph Dam, which releases cool water from the bottom of the reservoir..." This is misleading. Lake Rufus Woods, which is formed by Chief Joseph Dam and provides most of the inflowing water to the Wells Reservoir, does not stratify due to the shallow character of the channel behind the dam, and the short residence time of water passing through this reach of river (United States, 2020).

survival rates than members of their cohort that continue an upstream migration into dangerously warm Snake River waters.

One final example of a contributing factor to Snake River-origin salmonids expressing straying life histories is juvenile downstream transport. In order to reduce outmigration mortality, some juvenile salmonids are captured at Snake and Columbia river dams and transported via barge until release below Bonneville Dam. Although this practice increases downstream survival of juvenile fish (McMichael et al. 2011), returning adults are more likely to stray than fish that outmigrated in-river. Bond et al. (2017) documented stray rates 10-19 times higher in barged fall Chinook Salmon relative to their in river migrating counterparts, and stray rates are consistently higher for barged steelhead as well (Keefer et al, 2006, Tattam and Ruzycki, 2020).

Complicating the natural stray rate uncertainty topic is that steelhead return to the Columbia River and overwinter before making spring spawning attempts. During this fall, winter, and early spring adult residency steelhead may be subject to lawful (steelhead specific fisheries and non-target fisheries where they are captured as by-catch) and unlawful (poaching or otherwise) fisheries. During this period, they may also be subject to animal predators or natural overwinter mortality. These topics have not been well discussed in the Wells HCP CC and were not mentioned by commentors in letters to LIHI regarding the overshoot topic. This is concerning to Douglas PUD especially since Steelhead are among one of the most sought after or prized fisheries above Wells Dam, e.g. “*Creel surveys conducted by WDFW estimated that 8,210 anglers fished for 32,153 h and caught 3,202 steelhead during the 2015 season*” (T. Maitland, Washington Department of Fish and Wildlife, unpublished data replicated from Fuchs et al., 2021). The literature under represents this topic but the relatively modest and existing research on the topic confirms Douglas PUD’s concerns. For example, Canadian Researchers in the Bulkley River (Skeena Basin) of British Columbia hook-and-lined angled steelhead using barbless hooks and conventional steelhead equipment. After capture, tagging, and release, researchers tracked study fish and observed an estimated 3-day survival of steelhead of 95.5% (Twardek et al., 2018). Likewise, prior to this Canadian research, NMFS published an assumed catch and release mortality rate of 5% (NMFS 2003). Overwinter mortality of caught-and-released fish was estimated at 10.5%, in the Bulkley River example, with an estimated total pre-spawn mortality of 15.0% (Twardek et al., 2018). This observed loss occurred in an unimpounded reach of the Skeena River Basin. Any concern about the relative proportion of Snake River steelhead overshooting Wells Dam and their lack of return to a natal spawning stream downstream of the Wells Project needs to consider fishery and other non-hydro related outcomes, which notably were not discussed in the commentors letters. Supporting Douglas PUD’s concern here is a Steelhead Radio Telemetry Study in the Upper Columbia River. Fuchs (et al., 2021), including WDFW authors, make this point in published literature, “*After accounting for reported harvest, annual overwinter survival (of adult Steelhead) did not differ between main-stem and tributary habitat...*” Douglas PUD believes that these contributing factors (angling, predation, natural overwinter mortality) cannot be evaluated using PIT tags alone and would necessitate an active-tag study in the least. More importantly, these factors must be considered as part of a discussion that would advise or make management recommendations designed to benefit steelhead at Wells Dam.

There remains a great lack of clarity surrounding the overshoot issue, and opinions on how to address the topic are varied, but this is not unexpected. It remains a nascent issue, without consensus understanding as to its severity or agreement on how it can best be addressed. In fact, the initial discussions within the context of the Wells HCP related to the fallback of anadromous fish focused primarily on reduction of involuntary fallback by Plan Species<sup>6</sup> and preventing harm to ESA-listed populations originating upstream of the Wells Project by way of excessive fallback (English et al. 2001, English et al. 2003, see Section 4.4.5 of the Wells HCP and the Wells HCP CC 2005). As the times change and new issues emerge, Douglas PUD remains committed to identifying and carrying out appropriate solutions. However, management actions should be balanced against the risks to those stocks and species interacting with the Wells Project and originating in tributaries above. These stocks are explicitly protected by ESA Section 10 and the Wells Project HCP; a requirement that Douglas PUD is steadfastly supportive of.

Historically, the approach taken to address emerging questions has been one of study and applied scientific discovery. This process often unfolds more slowly than many would like, but it yields scientifically defensible and reproducible results and efficacious solutions. Douglas PUD may face criticism for employing a conservative approach, but this is the traditional method for issue resolution prescribed by the Wells HCP. Douglas PUD remains committed to adhering to the tried-and-true method of multi-party definition and discussion of an issue, scientific study, evaluation of the results, and implementation of the right changes to address an issue that draw upon the best available science. At the moment, the particular matter of steelhead overshoots continues to be a hotly-debated topic within the Wells HCP CC. In due course, Douglas PUD expects that all parties will arrive at a mutually agreeable resolution, similar to what has happened in the past.

In the absence of consensus around a plan for action, Douglas PUD has taken steps to better understand the issue such that an appropriate remedy may be identified. One such step that Douglas PUD has employed in collaboration with other hatchery monitoring and evaluation partners is to improve precision in overshoot abundance estimates through genetic sampling at Priest Rapids Dam (see meeting minutes from HCPHC, October 2024). Steelhead stock assessment at Priest Rapids Dam (PRD) provides the data used to generate spawn escapement estimates throughout the Upper Columbia region, including above the Wells Project, as well as the fallback-success estimates WDFW provided in its comments. WDFW generated those fallback-success estimates by extrapolating from known-origin PIT-tagged fish observed in the PRD sampling. By collecting genetic samples from steelhead captured at PRD and contracting with geneticists at CRITFC to analyze from which hatchery program or wild stock each fish originated, Douglas PUD will acquire much better estimates of the number and origins of steelhead overshoots that interact with the Wells Project each year.<sup>7</sup> Additionally, Douglas PUD is developing an active-

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<sup>6</sup> HCP Plan Species are spring Chinook Salmon, summer/fall Chinook Salmon, Sockeye Salmon, Coho Salmon, and steelhead.

<sup>7</sup> WDFW's comments to LIHI cite Murdoch et al. (2022a), which estimates the abundance and fate of overshoot steelhead. The results of this study continue to inform much of the discussion about steelhead overshoots at Wells Dam. The estimates of overshoot abundance are based on PIT tag detection histories of known overshoots, which are wild adult steelhead that were PIT-tagged as juveniles in locations downstream

tag study intended to provide details on steelhead behavior within the Wells Project area that PIT-tag studies cannot provide. Paired with the genetic information already being collected and analyzed and known-origin PIT-tagged fish, such a study will allow differentiation between overshooting steelhead that intend to fallback to a downstream natal stream and naturally straying fish. This study will also allow Douglas PUD to compare interactions with Wells Dam by those fish originating upstream and downstream of the Wells Project. This comparison is critical because the commentors demand spill to provide downstream passage for the latter while Douglas PUD seeks to protect the former from involuntary fallback shown to result from such spill. Clearly the Wells HCP CC must engage in balanced consideration of operations that may prove beneficial to overshooting steelhead while also proving detrimental to overwintering steelhead destined for upstream spawning habitat. However, such consideration cannot occur with currently available science, and thus the necessity of additional study such as that under development by Douglas PUD. Even the development of the study plan for Douglas PUD's proposed study will require review, input, revision, and unanimous approval from the Wells HCP CC, which will take time as members will need to decide *a priori* how to interpret the detection histories generated by the proposed study.

To summarize, fallback-success estimation-methodology, natural stray rate, and other related topics have all been discussed at length with the Wells HCP Parties, primarily in the HCP CC forum. An inability to generate consensus on an approach to define and address the issue of steelhead overshoots is in part indicative of the difficulty in understanding and differentiating between naturally occurring steelhead overshoot strays and fish that attempt to but fail to successfully fallback and return to a natal stream. Various parties have endeavored, through modeling and analysis, to define the scope of the issue, characterize the degree of threat it poses to steelhead populations throughout the Columbia River basin, and quantify the numbers of steelhead that overshoot Wells Dam and attempt to make a downstream passage. However, currently available estimates (modeled extrapolation of PIT-tag detections) are not based on methods that can definitively assign fates of tagged individuals or accurately attribute causes for missing data. Furthermore, in their inferences from their modeling efforts, they fail to account for known causes of missing data for which they have published estimates (e.g., harvest and overwinter mortality), and rely on unsupported assumptions. Their prescribed remedy to the problem identified by their modeling exercise does not account for potential negative consequences to non-target Methow- and Okanogan-origin steelhead overwintering in the Wells

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from PRD. For the study period (2010-2017), an average of only 5.1 known overshoots at PRD were detected at Wells Dam each year (PTAGIS Interrogation summary where observation site = WEA, Observation Year = 2010-2017, rear type = wild, species = steelhead, mark length <= 300, and Mark Site Basin is downstream of PRD). Gaining information about the origin of steelhead sampled at PRD through parentage analysis and genetic stock identification (see Hess et al. 2024 for background information) should help to address the problem of informative but unactionable estimates that are a consequence of small sample sizes. Furthermore, in its comments to LIHI, WDFW mentions that "DPUD... [was] given the opportunity to review and comment on (Murdoch et al. [2022a]) prior to publication." Douglas PUD did provide comments on this publication, many of which were left unaddressed, continue to be points of contention or discussion within the Wells HCP-CC, and are revisited in this response to LIHI comments (Draft Murdoch et al. 2022b with Douglas PUD's comments from 3-31-2021).

Project Reservoir that may be subjected to involuntary fallback under a spill regime intended to benefit overshoots. Finally, because of the lack of definitive data on multiple aspects of the overshooting issue as described above, the Wells HCP CC has yet to and lacks the data necessary to define by what measures they would determine the success of any remedial operations at the Wells Project, and therefore, do not provide the necessary degree of certainty required for reforming Wells Project operations. Douglas PUD has initiated studies intended to satisfactorily answer some of the questions surrounding the overshoot issue, such that an effective remedy may be employed. In time, Douglas PUD is confident that consensus on the scope and severity of the issue will be reached, and that an appropriate remedy will be identified and, if necessary, implemented. Douglas PUD looks forward to working collaboratively with all parties to the Wells HCP including but not limited to WDFW and Yakama Nation towards completing this investigation.

Recommended Condition:

In effort to support LIHI's mission to support certification while balancing the interests of stakeholders and impacted resources, Douglas PUD suggest the LIHI's certification be condition as follows:

- 1) Douglas PUD will be required to provide LIHI with an annual update on the proposed steelhead overshoot and fallback study, including status updates on the development of a study plan, field efforts, and final reports documenting adult steelhead interaction with the Wells Project.

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**WELLS HYDROELECTRIC PROJECT  
FERC PROJECT NO. 2149-WA**

**ATTACHMENT B**

**JUVENILE MIGRATION, SURVIVAL AND PASSAGE TIMING**

## Juvenile Migration, Survival and Passage Timing

In the comments submitted to the Low Impact Hydropower Institute (LIHI) regarding Public Utility District No. 1 of Douglas County (Douglas PUD)'s application for certification, the Washington Department of Fish and Wildlife (WDFW), the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), and the Columbia River Inter-Tribal Fish Commission (CRITFC) all raised the issue of bypass timing and arrival of juvenile fish at the Wells Hydroelectric Project (Wells Project) during their downstream migration. For example, CRITFC's letter states "...concern involves the timing of turbine bypass operations, which is a primary contributor to the Project's attainment of survival standards. The timing is based on data from passage timing at Rocky Reach Dam, located more than 40 miles downstream, and influenced by fish populations that enter the Columbia River below the Wells Project. While it is unclear whether this data accurately represents passage timing at Wells..." Likewise, the Yakama Nation comment letter has a much briefer rendition of CRITFC's comment. Very similarly, but perhaps most comprehensively, WDFW took on this important subject. In order to appropriately respond to the concerns related to juvenile survival and passage timing at the Wells Project, Douglas PUD elected to use WDFW's comprehensive discussion on the topic as the basis for our response. Our response here aims to address all comments on the issue, however.

Before responding in detail, it is prudent to first respond from a more general perspective of passage and survival at the Wells Project. The facts herein are not disputed but are rather supported by numerous studies and the Wells Anadromous Fish Agreement and Habitat Conservation Plan's (Wells HCP) Coordinating Committee (CC) (e.g. see Douglas PUD 2024a; Douglas PUD 2024b). For instance, Douglas PUD has a well-documented record of providing more than the Wells HCP-required 95% bypass coverage (defined as providing bypass passage for at least 95% of the migration of each Plan Species) for all five plan species (e.g. Douglas PUD 2024a; Douglas PUD 2024b). Survival studies at the Wells Project dating back to the late 1990's have all exceed the required 93% Juvenile Project Survival standard (Bickford et al. 1999; Bickford et al. 2000; Bickford et al. 2001; Bickford et al. 2011) including the most recently completed study and CC approved report in 2020 (Gingerich et al., 2020; Wells HCP CC 2020). The Wells Project (reservoir, dam passage, and tailrace) has the highest measured survival for spring migrating fish compared to any other mainstem hydro-project on the Snake and Columbia rivers (NMFS 2012<sup>1</sup>). Douglas PUD hopes that LIHI will take comfort that the Wells Project exceeds the 95% bypass operation coverage for all plan species, is exceeding the minimum survival standard by approximately 3%, and has the highest project survival estimate for spring migrating fish in the entire Columbia Basin. It should be further noted that Douglas PUD looks forward to our continued partnership with all the Wells HCP Coordinating Committee (CC) members' including but not limited to WDFW and Yakama Nation towards furthering our understanding of these important metrics and conservation issues.

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<sup>1</sup> See page 36 of 2012 Biological Opinion.

WDFW’s comment letter states, “*Juvenile Downstream Passage: Information provided by DPUD states that bypass operations beginning in early April successfully pass at least 95% of anadromous juvenile(s) through the Wells Project. However, juvenile salmonid use and passage through the Wells Project is not assessed using detection data from fish entering or exiting the dam.*” Clarifying note, Douglas PUD believes that WDFW’s statement “entering or exiting the dam” refers to reservoir entry and dam passage, and is responding with that assumption.

From Douglas PUD’s perspective “use” and “passage” are two very important and distinct aspects of juvenile salmonid life history. For example, little is known about tributary migration versus reservoir use (e.g. Monzyk et al 2010) but some literature shows salmonids continue rearing in the mainstem Snake and Columbia rivers after existing tributaries and before making a migration (e.g. Apgar et al. 2020; Connor et al. 2001). Use of the Wells Project Reservoir area and passage at Wells Dam are not likely interchangeable terms in all cases. WDFW may not have been trying to conflate these terms and instead was trying to delineate the two. As a point of clarity Douglas PUD states that reservoir use and migration past Wells Dam are different measures and therefore are expected to have different dates associated with them. This is an important point of clarity when determining 95% non-turbine bypass coverage for plan species interacting with the Wells Project. Douglas PUD agrees with WDFW that these terms would benefit from more study, including improved detection at the confluence of the Methow<sup>2</sup> and Columbia rivers and improved detection at Wells Dam<sup>3</sup>, especially for wild Spring Chinook. Both of these actions Douglas PUD is diligently working on; a point that WDFW and Yakama Nation are both aware of but did not mention in their comment letters to LIHI (E.g. Wells HCP CC 2024; Douglas PUD 2024d). Douglas PUD has made tremendous strides towards improved detection for plan species and has been a leader on the mainstem Columbia River towards improving the detection and our understanding of passage timing.

Since 2016, “WEJ” or the Wells Dam PIT detection system has been collecting data on juvenile salmonids interacting with the Wells Project. At the time of installation, it was the first of its kind. No other mainstem Columbia or Snake River dams had PIT tag detection in spillways. Only juvenile bypass facilities with pipes had this capability, of which the Wells Dam has none. In 2020, Lower Granite Dam added capability like the Wells Project (mainstem spillway detection). Not just WEJ, but the Rocky Reach Juvenile Bypass PIT detection system (RRJ) was conceived and funded by Douglas PUD (commissioned in 2010), despite its off-project location at neighboring Chelan PUD’s Hydroelectric Project, a point missed by LIHI

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<sup>2</sup> Drawings for the improved detection project were provided during an October meeting Power Point Presentation given to the HCP Policy committee where WDFW and Yakama Nation member were present and in HCP CC monthly meetings discussed in October and November meetings and captured in approved meeting minutes in 2024 (Wells HCP CC 2024).

<sup>3</sup> Wells HCP CC committee representatives including the Yakama Nation toured the Wells Project on June 25, 2024 with specific emphasis on describing PIT tag detection capabilities. NMFS and WDFW representatives completed similar and private tour of these characteristics with Douglas PUD Natural Resources staff on Friday October 4, 2024.

commenting agencies. Douglas PUD understood paired-release survival estimates at the Wells Project would benefit greatly from detection of tagged fish at Rocky Reach Dam and initiated design of this detection facility in 2008, signing an interlocal agreement with Chelan PUD in 2009 (Douglas PUD 2009) to allow construction of the detection system and cooperative operation and maintenance. Douglas PUD proactively implemented this project without any Biological Opinion, FERC license, or Wells HCP requirement to do so. Douglas PUD continues to lead the development of new PIT tag detection applications for the benefit of Upper Columbia River salmon and steelhead, with multiple systems currently in design and/or permitting stages. Douglas PUD was disappointed that comment letters to LIHI failed to acknowledge this leadership.

For LIHI's edification regarding the development of assessing bypass timing and coverage for juvenile salmonids at Wells Dam, it should be noted that there has been a long history of study and development dating back to at least the late 1970's. Some of this important history is summarized in Douglas PUD's Post Season Bypass Report and Passage Dates Analysis. The most recent version of this annual report was unanimously approved by Yakama Nation and WDFW as well as the balance of Wells HCP CC signatories on December 16, 2024 (Douglas PUD 2024a):

*“The timing of juvenile bypass operations at Wells Dam as specified in the Wells Habitat Conservation Plan (HCP) was established by 21 years of hydroacoustic monitoring of the juvenile emigration at Wells Dam, and 14 years of fyke-net confirmation of species composition within hydroacoustic data. The HCP, signed in 2002, requires periodic (10-year intervals) evaluation of bypass performance with additional hydroacoustic and species composition monitoring. However, by the time of the first reevaluation in 2012, fyke netting was no longer available as a permitted monitoring methodology. Therefore, the Wells HCP Coordinating Committee (CC) sought alternative approaches to monitoring passage timing of Plan Species at Wells Dam, which lacks facilities for systematically sampling downstream migrating juvenile salmon and steelhead.*

*As a replacement for 10-year fyke-net check-ins, the CC approved a 5-year analysis of passage timing by Columbia Basin Research, which compared annual dates of Wells bypass operations with estimates of Wells Dam passage dates for Plan Species. Those estimates of passage dates were derived by subtracting estimates of Wells-to-Rocky Reach travel times from annual passage-timing data collected at Rocky Reach Dam. The CC relied on that analysis to modify the dates of Wells bypass operations in 2012 (Wells HCP CC 2011) and requested that Douglas Public Utility District (PUD) continue to provide annual analyses to monitor the performance of the new bypass operation dates for providing the required bypass passage for 95% of the outmigrations of each Plan Species. These annual analyses by Columbia Basin Research were also the basis for the adjustment of the Wells bypass termination date for the 2021 season (Wells HCP CC 2021).*

*Analysis of the new bypass termination date indicated continued compliance with HCP bypass criteria in 2021, consistent with the previous nine years of analysis. However, the 2022 post-season analysis suggested that the 9 August termination date was two days earlier than necessary to provide bypass passage for 95% of the outmigration of subyearling Chinook Salmon. Therefore, in an adaptive management decision made in 2023, the CC approved Douglas PUD's proposal to use an in-season estimator of passage timing for subyearling Chinook Salmon to ensure that the bypass termination date was consistent with real-world run timing (Wells HCP CC 2023). The approved method relied on Program RealTime<sup>4</sup> to determine when the 95th percentile of the run-of-river subyearling Chinook Salmon migration passed Rocky Reach Dam, and ended bypass operations at Wells Dam at midnight on that date. The CC recognized that the Rocky Reach 95th percentile passage date for stocks migrating from tributaries upstream of Wells Dam would provide a conservative estimate of passage timing at Wells Dam, given the travel time between Wells and Rocky Reach dams. The expectation of the CC was that the new methodology would provide a more robust determination of actual passage timing of subyearling Chinook Salmon (see Methods, below) and would respond to in-season annual and/or seasonal factors influencing passage timing.”*

The report not only illustrates compliance with the 95% bypass requirements but illustrates one of many examples where Douglas PUD has been *adaptive* with insuring compliance with the 95% requirement. Comments submitted to LIHI from the commenting agencies were critical of Douglas PUD, suggesting a lack of adaptive management; and yet failed to mention the instances where following more than a decade of compliance, Douglas PUD has proposed and the HCP CC approved a flexible end date to prevent non-compliance with the 95% standard due to annual variation in passage data. In fact, the dates of bypass operation have been modified at multiple times since the signing of the Wells HCP and in response to run timing analysis provided by Douglas PUD and reviewed and approved by commenting agencies.

Assessing compliance with the 95% bypass standard is a once-in-every-ten-year requirement. From the HCP,

“Additional hydroacoustic and species composition monitoring shall be conducted once every 10 years in order to verify that a significant component (greater than 5%) of the juvenile migration is not present outside the normal bypass operating period (April 10 through August 15) and to verify that the operations established by the Coordinating Committee are adequately protecting 95% of the spring and summer migrations of juvenile Plan Species. that was intended to be supported with fyke net sampling at Wells Dam. (Wells HCP 2002<sup>5</sup>)”

Instead of assessing compliance once every ten years, Douglas PUD has funded the preparation of a Passage Dates Analysis and Post Season Bypass Report annually since 2012 even though

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<sup>4</sup> Available here ([https://www.cbr.washington.edu/inseason/smolt\\_midcol\\_che](https://www.cbr.washington.edu/inseason/smolt_midcol_che))

<sup>5</sup> HCP Agreement 2002. See Section 4.3.2; page 16

the requirement is once every ten years. The University of Washington’s School of Aquatic and Fisheries Sciences leads this analysis annually with Douglas PUD funding. Douglas PUD suggests that this effort acknowledges our commitment to go above the minimum standard and is supportive of LIHI’s pending certification.

The Wells Project is tremendously unique, which supports the LIHI’s determination of “Low Impact.” Due to the unique design and engineering, greater than nine out of every ten juvenile salmonids use non-turbine routes at Wells Dam while the bypass (modified spillways) is operating. Three years of hydroacoustic study between 1990-1992 show that estimates of bypass (non-turbine) efficiency for spring migrating salmon is 92.0% and for summer migrating salmon is 96.2% (Skalski et al 1996). The reasons for this exceptional bypass efficiency are largely threefold starting with spillways that sit on top of, rather than adjacent to, turbine units (like all other mainstem Columbia River Dams). The spillways at Wells Dam sit on top of non-fluted (not thrust towards the surface) turbine intakes. Fish traveling through turbines have to descend to at least 71-75 feet (range based on forebay elevation) below the water surface to enter intakes (Douglas PUD 2024c<sup>6</sup>). The spillways take advantage of turbine attraction flow but also the natural behavior of juvenile salmonids to be in the upper water column when traveling downstream. Second, the modified spillway entrances stretch across the entire dam face, as opposed to one corner of the dam. Migrating fish are afforded five to seven (5 leaf gates and 2 flap gates) non-turbine bypass options across this entire river width. When flows are 140 kcfs or more during the bypass period all five bypass bays are operating. Likewise, during the bypass period when a turbine unit is running, an adjacent bypass bay is also. Thirdly, the spillway entrances are modified to occlude outside flow, which provides a surface flow net that guides migrating fish in the upper 71-75 feet of the water column through a perforated bypass opening, between turbine silos, and directly through open spillgates (Wells HCP 2002 section 4.3 “Juvenile Dam Passage Survival Plan”). The unique juvenile bypass system of the Wells “hydrocombine” is one of the most important features that supports the Wells Project’s pending “low impact” designation. Unlike other mainstem Columbia River projects where bypass efficiency is often less than 50% (e.g. Skalski et al. 2023)<sup>7</sup>, the Wells Project benefits from this unique and fish friendly design. Balloon tag studies of salmon using the bypass structures at the Wells Project showed that juvenile fish using them had 100% survival (Heisey 1992).

Five years of survival studies usings hundreds of thousands of juvenile fish from two different spring migrating species show that survival of fish through the Wells Project Reservoir, concrete and immediate Tailrace far exceeds the 93% juvenile survival requirement in Wells HCP (Gingerich et al, 2020). The most recent survival study completed in 2020 confirmed these research findings and was approved by the Wells HCP CC including WDFW and Yakama Nation on December 15, 2020 unanimously (Wells HCP CC 2020). These fish were released

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<sup>6</sup> See Figure 2 and Page 4 of the 2024 Gas Abatement Plan Reference for a detailed diagram and description of they Wells Dam Bypass.

<sup>7</sup> Passage proportions at Rocky Reach Dam in 2023 for yearling Chinook salmon were 45.7% ( $SE \approx 2.7\%$ ) at the surface collector (juvenile bypass) (Skalski et al., 2023).

above and below Wells Dam and therefore were used to assess performance of “fish entering and exiting the dam” (traveling through the reservoir and passing the dam as clarified earlier).

WDFW’s comment letter states, “Concerns have also been raised about the appropriateness of the early April start date for the bypass given ESA-listed wild spring Chinook are present prior to the non-bypass period. Currently, PIT tagged fish from populations upstream of the Wells Project are detected at Rocky Reach Dam (67 km downstream) and estimates of mean travel time are used to estimate when fish passed Wells Dam. This methodology poses two primary concerns: (1) estimates of passage timing at Wells Dam are solely dependent on the operational period of the Rocky Reach surface collector and (2) estimates of passage timing are only based on those fish that survive and are detected at the Rocky Reach surface collector.”

Douglas PUD agrees, estimates of passage timing at the Wells Project are dependent on the operational period of the Rocky Reach surface collector. But WDFW along with other Wells HCP CC parties agreed to this approach unanimously in 2011 when fish managers acknowledge that fyke nets were no longer an acceptable sampling methodology (Wells HCP CC 2011). Since 2012, the Wells HCP CC including WDFW and Yakama Nation have approved the Post Season Bypass report and Passage Dates Analysis unanimously. To date, no other option to determine compliance with the 95% requirement has been formally proposed. Frankly, Douglas PUD believes that the current methodology is the best balanced and most appropriate method given the lack of fyke net approval. Wells HCP CC member approval of these reports acknowledges this view. As a reminder, fyke net data completed prior to 2004 showed that while some fish were detected at the Wells Project during March sampling periods greater than 95 percent of juvenile migrants were detected in April, May, June and July.

Likewise, Public Utility District No. 1 of Chelan County’s (Chelan PUD) index sampling that was completed in March 2024 as part of a scheduled “every ten year” check in study at Rocky Reach Dam (next downstream Project below Wells Dam) show compatibility with the Wells Project spring bypass operations and the 95% requirement. Index counts at Rocky Reach Dam for spring migrants showed that far less than 5% of the run arrived at Rocky Reach Dam during the month of March (Chelan PUD 2024<sup>8</sup>). Consistent with that observation, the Wells Dam Passage dates analysis that uses median travel times between the Wells and Rocky Reach projects and that included Rocky Reach index counts during the month of March was supportive of Wells Project’s bypass operations and coverage in 2024. Douglas PUD provided bypass operations for 99.46% of yearling spring Chinook that passed the Wells Project. By averaging the Passage Dates analysis for the preceding 12 years (2012-2023) and using Rocky Reach juvenile index counts and an April 1 start date (excluding March), an average bypass coverage of 99.78% is established for yearling spring Chinook at the Wells Project when bypass operations begin on April 9th. Notably starting the Rocky Reach Juvenile Bypass System (RRJBS) one-month earlier in 2024 changed the Wells Project bypass coverage for this

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<sup>8</sup> Presented to the Wells HCP CC October 22, 2024 at monthly meeting. See slide 6: 5% of yearling Chinook arrived at Rocky Reach Dam on 4/17 despite operating RRJBS one-month earlier than normal.

species by just 0.32% (easily within interannual variation) and had no significant effect on Douglas PUD's requirement to provide 95% bypass coverage to spring migrating salmonid juveniles (Douglas PUD 2024a).

Douglas PUD is open to new proposed approaches or designs towards assessing compliance with the 95% bypass coverage standard, provided the assumptions are more easily defined and accounted for. Douglas PUD looks forward to vetting that approach, should it arrive within the Wells HCP CC. In the interim, Douglas PUD will continue to pursue improved PIT tag detection capabilities at the mouth of the Methow River and Wells Dam where future understanding specific to juvenile fish interaction with the Wells Project are expected.

WDFW's comment letter states, "*Furthermore, because the Wells Juvenile Bypass PIT tag Detector has historically low detection probability (< 1%), sample sizes for this calculation are small.*" To be clear detections at WEJ and subsequent detection at RRJ (Rocky Reach Dam) are designed and used in the 95% passage analysis only to provide species-specific travel times between the two dams. WEJ is not used to determine the distribution of fish arriving at the Wells Project, in part because of the low sample sizes and inconsistent tagging effort, but more importantly because it lacks mechanistic detection. More specifically, detections at WEJ are expected to be influenced by wild swings in detection probability<sup>9</sup>. True, sample sizes are small but not insignificant, and are improving every year for all species apart from Sockeye<sup>10</sup>. Douglas PUD's approved 2024 Passage Dates Analysis (Wells HCP CC Approved December 16, 2024; Douglas PUD 2024a) shows the most recent sample sizes in Table 1 column three:

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<sup>9</sup> Detection probability is the percent of tagged fish detected as they move past a detection point. If Detection probability swings largely due to project operations or due to changes in river discharge, using detections to determine a passage distribution without correction for detection probability would be scientifically invalid.

<sup>10</sup> Sockeye travel times are not derived from PIT tags given the very low PIT tag rates of sockeye in the upper Columbia River. Rather previous acoustic tag studies completed by Chelan PUD serve to generate travel time estimates between Wells Dam and Rocky Reach Dam. All other Plans species travel times are derived from PIT tag detections.



**“Table 1:** Median travel times between Wells and Rocky Reach dams, based on either detection of PIT-tagged fish at both facilities (steelhead, subyearling and yearling Chinook Salmon, Coho Salmon: 2016–2024; see Appendix), or acoustic-tag study results (Sockeye Salmon: 2006, 2008, and 2009). Sample size = number of travel time observations available.

<b>Plan Species</b>	<b>Median travel time</b>	<b>Sample size</b>
Yearling Chinook Salmon	5 days	<b>126</b>
Subyearling Chinook Salmon	11 days	<b>16</b>
Steelhead	2 days	<b>777</b>
Sockeye Salmon	1 days	1,348
Coho Salmon	6 days	<b>223”</b>

The total number of fish that have been detected at WEJ and subsequently detected at RRJ is not insignificant and for all species, apart from summer migrants (subyearling Chinook), a robust sample is provided. Further, improvement in WEJ is expected to continue this sample size growth. For spring migrating salmonids the sample sizes are good. These strong sample sizes allow researchers to compute median travel time between the two dams and, therefore, estimate an earlier passage date at Wells Dam. Examining multiple years of data supports this point. The 2024 median travel times were exactly the same as in 2023 (Douglas PUD, 2023). In 2022, the analysis had only minor changes from the 2024 report where subyearling Chinook took 15 days vs 11, Coho took a median 6 days instead of 8, Steelhead took 2 days instead of 4, and Yearling Chinook 9 days instead of 5. These modest 1-4 day changes in travel times occurred despite the fact that 365 fish were added to the sample between 2022 and 2024 (Douglas PUDa, 2024; Douglas PUD, 2023; Douglas PUD, 2022). Already robust samples are expected to continue to grow each year and with it the accuracy of median travel times for each plan species.

WDFW’s comment letter states, *“While most of the juvenile wild steelhead (65%) are detected during bypass operations, 75% of wild spring Chinook detection occurs during the non-bypass period (i.e., fall/early winter). In other words, current monitoring and detection at Wells appears to be incapable of providing a clear picture on the project’s impacts on wild spring Chinook, the most imperiled salmonid species in the UCR.”*

Douglas PUD disagrees with the analysis that 75% of the detections of wild spring Chinook occur during the non-bypass period. However, Douglas PUD agrees that the majority of WEJ detections have occurred when the bypass is not operating. Even if not intentional, the statement is misleading and implies that 75% of wild spring Chinook pass the Wells Project

during non-bypass periods (or perhaps would pass if the bypass was operating). The percentage of fish detected at WEJ without knowledge of detection probability holds no value (See footnote eight above). For example, WEJ is located in bypass bay 2 in a single column of four columns of bypass panel windows. Big changes in spill operations (spillway open width), often associated with spring freshet flows, should be expected to dramatically reduce detection probability of PIT tag detection systems at the Wells Project's Spillways. Higher flows during the spring freshet are likely to reduce detection probabilities as fish move more quickly across antenna arrays or pass via non-bypass spillways opened to accommodate the higher discharge in the spring. Only mechanistic detection at the Wells Project or detection that can appropriately assign changes in detection probabilities throughout the year would be useful in determining the percent of fish interacting with the Wells Project throughout the year. Douglas PUD is moving toward improved PIT detection for fish entering and passing the Wells Project, but ultimately PIT-tag detection may not be the correct tool to determine passage timing at the Wells Project, a point that Douglas PUD believes WDFW may share.

Douglas PUD agrees that current PIT tag detection at the Wells Project alone is “incapable of providing a clear picture” of run timing at Wells Dam. But disagrees that the impacts on plan species are poorly understood. Survival Studies and Passage Dates Analyses serve as a key approach to understanding the Wells Project impacts as the Wells HCP intended. Our current approach to passage dates analysis has been approved by the HCP CC, including WDFW and Yakama Nation for some 13 years. Douglas PUD looks forward to continued work with WDFW and the Yakama Nation on this important topic as well as the entire Wells HCP CC members. Douglas PUD believes that the addition of the Methow PIT Tag Train Bridge project and additional PIT tag detections capabilities at the Wells Project will further our collective understanding of juvenile fish interactions at Wells Dam.

#### Recommended Conditions:

In effort to support LIHI's mission to support certification while balancing the interests of stakeholders and impacted resources, Douglas PUD suggest the LIHI's certification be condition as follows:

- 1) Douglas PUD will provide LIHI with an annual update on the status and adjusted operational timing of the juvenile fish bypass system and passage dates analysis report.
- 2) Douglas PUD will provide LIHI with an annual update on the status and ongoing improvements to the PIT tag detection at the Wells Project.
- 3) Douglas PUD will provide LIHI with annual updates on the progress towards improving PIT tag detection on the lower Methow River, including the Methow River Train Bridge.

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**WELLS HYDROELECTRIC PROJECT  
FERC PROJECT NO. 2149-WA**

**ATTACHMENT C**

**SUBYEARLING CHINOOK SALMON**

## Subyearling Chinook Salmon

In the comments submitted to the Low Impact Hydropower Institute (LIHI) regarding Public Utility District No. 1 of Douglas County (Douglas PUD)'s application for certification, the Washington Department of Fish and Wildlife (WDFW), and the Columbia River Inter-Tribal Fish Commission (CRITFC) raised the issue of Douglas PUD lacking a subyearling Chinook passage and survival study at the Wells Hydroelectric Project (Wells Project). For example, CRITFC stated, "*the PUD has not yet completed a survival study for subyearling Chinook salmon. While technology has previously limited such studies, recent advances in PIT and acoustic tags (e.g., eel/lamprey acoustic tags) suggest these limitation no longer apply*". Likewise WDFW wrote, "*Subyearling summer Chinook are relatively small compared to yearling migrants and tagging technology has historically been the primary reason survival count be estimated. However, tag technology has improved significantly and is now safe for subyearlings.*" Douglas PUD shares a concern for the wellbeing of summer Chinook salmon originating above Wells Dam and is committed to understanding the survival of these juveniles when the methodologies and the assumptions that govern these models can be met or addressed in a robust study design. The issue of subyearling Chinook survival is currently a recurring topic on Wells Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP) Coordinating Committee's (CC) monthly meeting agendas, where Douglas PUD and other participating HCP Parties are actively working towards this goal. The current HCP Phase designation and agency and tribal approval of this designation is an important piece of the body of work completed to date on this topic. Douglas PUD's detailed response to this important topic is provided herein.

The Wells HCP CC designated the HCP Plan Species subyearling summer/fall Chinook Salmon as in Phase III (Additional Juvenile Studies) in February 2005 based upon the calculation of a Juvenile Dam Passage Survival estimate of greater than 95 percent (Wells HCP CC 2005). This decision followed the Wells HCP Survival Standard Decision Matrix from Section 4.1.2, in which a calculated estimate of 95 percent can substitute for an actual measured estimate of Juvenile Dam Passage Survival when circumstances prevent the actual measurement via a dam-passage study. Within that decision matrix, in circumstances where Juvenile Project Survival cannot be measured, both the calculated and measured Dam Passage Survival options provide a means for determining whether Plan Species survive passage of Wells Dam at a rate (at least 95%) that indicates that Juvenile Project Survival likely meets the Wells HCP standard of 93 percent. The expectation of Wells HCP negotiators was that if Plan Species survive passage of the dam at a rate of at least 95 percent, then they most likely are surviving passage of the entire Wells Project (reservoir, dam, and tailrace) at a rate of at least 93 percent. Thus, the achievement of a measured or calculated estimate of at least 95 percent Juvenile Dam Passage Survival provides evidence that the Juvenile Project Survival standard of 93 percent has been achieved even though circumstances prevent the actual measurement of Juvenile Project Survival.

Commentors to LIHI on this topic alleged that survival by subyearling Chinook through the Wells Project area is unknown, implying that the Wells HCP CC has no knowledge regarding the survival rate of subyearling Chinook Salmon through the Wells Project area despite the requirements of the Wells HCP to measure their survival. While it is true that Douglas PUD has not completed studies to measure Juvenile Project Survival for subyearling Chinook Salmon, as described above, the

signatories to the Wells HCP (including WDFW and the Yakama Nation) approved in 2005 a Wells HCP Phase III designation for subyearling Chinook based on Calculated Juvenile Dam Passage estimates that indicated a high probability that the 93-percent Juvenile Project Survival Standard is being achieved. Furthermore, the studies that provided that Calculated Juvenile Dam Passage Survival estimate (Johnson et al. 1992; Skalski et al. 1996) relied on robust methods that encompassed the entire size distribution of subyearling Chinook Salmon migrants over a five-month migration period—an achievement that is not duplicated by any other approved survival studies anywhere in the Columbia River hydrosystem, and is no longer possible because it is not possible to obtain permits for studies relying on methods used in the 1980s through the early 2000s. Those methods used hydroacoustic technology to enumerate target fish passing through turbine and spillway intakes, and physical capture of samples of those fish in fyke nets to identify the species composition of targets enumerated by the hydroacoustic equipment. Unfortunately, salmon and steelhead captured in those fyke nets did not survive, and thus the combined hydroacoustic/fyke-netting study methodology is no longer permissible. No other study methodology available can match that methodology for representative sampling of the study population because all other methods rely on fish tags. This distinction is especially important for subyearling Chinook Salmon as described below.

While survival studies of tagged yearling Chinook Salmon and steelhead also limit representation by relying on only a sample of those fish that can be captured from the run at large or produced in a hatchery as surrogates for the run-at-large population, yearling migrants exhibit much narrower fish-size and migration-timing distributions than subyearling Chinook Salmon in the Wells Project area, and thus are much easier to represent in a study (e.g. Gingerich et al. 2020). The HCP CCs have approved multiple studies of yearling migrants despite challenges with representation of the population of inference, because study designs and analytical methods available can overcome the potential biases posed by those challenges in studies of yearling migrants. However, the challenges of representation posed by the subyearling life-history in the Wells Project area exceed the capacity of all tag technology and analytical methods available. A successful survival study will require advances in both tag technology and analytical approaches, and adaptation by the Wells HCP CC to novel methods that may require adjustments to the language of the HCP itself. In the following paragraphs we elaborate on the unique challenges that have prevented Douglas PUD from conducting studies to measure Juvenile Project Survival of subyearling Chinook Salmon through the Wells Project.

Due to the position of the Wells Project in the spawning, rearing, and migration habitat of summer/fall Chinook Salmon, no other hydroproject in the portion of the Columbia River Basin accessible to anadromous salmonids faces such a complex suite of obstacles to studying subyearling Chinook Salmon as the Wells Project. In short, limitations to conducting survival studies for subyearling Chinook Salmon in the Wells Project include inadequacies in tag technology; challenges to obtaining an adequate sample size across the duration of the migration; lack of facilities for in-river or at-project fish collection; concerns over tag effects; failure of several assumptions of the paired-release survival-study model used in all HCP studies to date because of their complicated life history, protracted migration, and wide range of body sizes (As summarized in Gingerich and Kahler 2020). Because of these limitations, the Wells HCP Parties accepted a Calculated Juvenile Dam Passage Survival estimate of greater than 95 percent for



subyearling Chinook Salmon (as described above), based upon studies of bypass efficiency (96.2% for subyearling Chinook Salmon) and balloon-tag studies that documented no measurable injuries or mortality for fish passing Wells Dam via the Wells Bypass System (Heisey 1993).

Following the approval of the Calculated Dam Passage Survival estimate in 2005, and as specified in the Wells HCP, the HCP CC continues to monitor developments in survival-study technology for emerging opportunities to measure Juvenile Project Survival for subyearling Chinook Salmon. The challenges impeding Juvenile Project Survival estimation were such that the HCP CC was forced to await technological developments that promised a future study opportunity, but without a clear timeline. Improvements in both tag and detection technology in the mid-2000s led the combined HCP CCs (the Coordinating Committees for the Wells, Rocky Reach, Rock Island HCPs that meet collectively) to convene a “Subyearling Workshop” in November 2009 to determine whether limitations identified during Wells HCP development continued to represent valid impediments to study implementation. The Subyearling Workshop convened experts from the NMFS and USFWS to provide to the HCP CC presentations on the state of the science for subyearling Chinook Salmon life-history variation and behavior, survival-study experimental design and model assumptions, tag technology and study logistics, and tagging and tag effects. Public Utility District No. 2 of Grant County also presented on the lessons learned from their pilot studies on subyearling Chinook Salmon, and Douglas and Chelan PUDs presented on the current, limited understanding of the life-history variations exhibited by mid-Columbia subyearling Chinook Salmon. Following the Subyearling Workshop, the HCP CC concluded that active-tag technology remained unsuitable for studies of subyearling Chinook Salmon and that the complicated life-history expression in the regional subyearling Chinook Salmon population precluded survival studies because of the violation of several assumptions of survival-study models. The HCP CC directed the PUDs to continue pursuing measures for evaluating passage-survival rates of subyearling Chinook Salmon, including obtaining data to inform understanding of the behavior and life history of subyearling Chinook Salmon in the mid-Columbia.

To more precisely address the limitations discussed at the 2009 Subyearling Workshop, Douglas PUD voluntarily initiated a pilot effort of a multi-year life-history study of subyearling Chinook Salmon in the spring of 2011. Following the success of the pilot effort, Douglas PUD expanded the study in 2012 and 2013. The intent of the study was to describe the behavior, distribution, size, and life-history strategies of subyearling Chinook Salmon in the Wells Reservoir, with the specific objectives of comparing observed behaviors with survival-study assumptions. From these studies, Douglas PUD worked to identify the extent to which subyearling Chinook Salmon conform to each of the assumptions of the current survival-study models, and to determine whether adaptation of technical or statistical methods could provide acceptable study approaches for measuring either Wells Project or Dam Passage Survival.

Study results (Gingerich and Kahler 2020) indicated that subyearling Chinook Salmon in the Wells Project were available in high numbers in late-April and May but few were large enough to tag with a standard 12-mm PIT tag until late-May when they reached 60 mm FL. Not until mid-June did the average length of fish captured with beach seines reach 60 mm, and not until mid-July did the length for all fish captured equal or exceed 60 mm. Travel times for tagged fish from release to Rocky Reach Dam (PTAGIS site code RRJ) ranged widely from 2 days to 66 days, with most

fish falling into two general migration strategies: fish of the entire size distribution that migrated to RRJ within 20 days; and fish comprising individuals that fell into the smaller two-thirds of the size distribution of tagged individuals with travel times to RRJ exceeding 20 days (up to 66 days). In addition, tagged fish were often recaptured days or weeks later in similar or upstream locations suggesting many of the study fish were using the reservoir for rearing and foraging rather than migrating through the Wells Project. Finally, as fish increased in size, their availability to beach seining (capture and tagging) diminished as they apparently shifted to deeper habitats.

Study conclusions were that the tag technology then available was incapable of tagging a representative sample of individuals from the entire size distribution, and would not provide a long enough tag life to encompass the protracted migration that was observed in tagged fish. Larger fish that were observed in the reservoir appeared to be more offshore and more consistent with the size distribution of fish captured during fyke net collection that occurred in the 1980's at Wells Dam. As such, beach seining may not be an appropriate approach to capture, tag, and study a representative sample of available or migrating fish within the Wells Project.

Douglas PUD presented results of their study at the second Subyearling Workshop convened by the HCP CC and Priest Rapids Coordinating Committee (PRCC) in June 2016. Douglas PUD also presented a comparison of the historical data from fyke-netting at Wells Dam with the beach seining data from 2011-2014, showing that, historically, subyearling Chinook Salmon passed Wells Dam from mid-April through late-August, and that the size distributions of fyke-netted individuals included a greater size range than those captured by beach seining. Beach seining substantially under-represented the largest individuals. Other presentations at the 2016 workshop described advances in active-tag technology, updates on subyearling Chinook Salmon life history from the Entiat and Snake rivers, and the analytical challenges to studying a population with complex migratory behavior. Conclusions from the 2016 workshop include, 1) current tag technology available in 2016 did not allow the tagging of a representative sample of the population using the reservoir because the fish are either too small or do not migrate within the life of the battery; 2) available capture methods cannot obtain a representative sample of the size distribution present because of shifting migratory and/or foraging behavior with increasing size; 3) fish length was not a reliable predictor of migratory behavior; 4) variability in migratory behavior leads to multiple violations of study-model assumptions; 5) no analytical solutions can overcome the inability to distinguish between mortality and protracted residency.

On June 11, 2024, the HCP CC and PRCC convened the third Subyearling Workshop. Douglas PUD again presented findings from the 2011-2013 subyearling Chinook Salmon study extended by analysis of data through 2023 from continued annual beach seining and PIT-tagging efforts by the Confederated Tribes of the Colville Reservation (CTCR) at locations originally sampled by Douglas PUD. Combined, these efforts provided 13 years of data on natural-origin subyearling Chinook Salmon PIT-tagged in the Wells Reservoir, with over 200,000 tagged individuals. Analysis of the 13-year dataset confirmed findings from Douglas PUDs original study, but also provided thousands of recaptured individuals to improve insights into growth and residency, and to bolster findings regarding adult returns. In-reservoir and downstream recaptures indicate that fish grow rapidly, such that the anticipated average length at the time of Wells or Rocky Reach dam passage of those fish with protracted reservoir residency is nearly 20 mm longer than the

average length at tagging, and exceeds the length of most individuals readily available to beach-seine capture. Additional data on adult returns corroborates the original finding that larger individuals (at tagging) are more likely to survive to adult return. Finally, differences in the representation on the spawning grounds of PIT-tagged and non-PIT-tagged individuals from a brood year indicate that the PIT tagging effort is poorly representing the run at-large and/or the process of tagging or the experience of carrying a PIT tag results in decreased survival relative to untagged individuals.

Other presentations at the 2024 Subyearling Workshop included findings from Chelan PUD's studies of subyearling behavior within the Rock Island Project; migratory behavior of PIT-tagged summer Chinook Salmon from the Entiat and Methow rivers; size and emigration timing of captured summer Chinook Salmon from the Methow, Entiat, and Wenatchee rivers; current and future tag technology and tag effects; available survival-study models and their suitability for studies of subyearling Chinook Salmon; and novel modeling approaches incorporating both temporal and spatial mark-recapture data. Dr. Erika Rubenson's presentation reported an apparent temperature effect for subyearling Chinook captured and tagged at Rocky Reach Dam for Chelan PUD's behavior studies, where fish tagged when water temperatures were high exhibited dramatically lower survival than those tagged at lower temperatures. This is consistent with studies on adult salmon in the Fraser River, and further complicates the study of subyearling Chinook Salmon because their emigration extends into late summer. A determination of an appropriate subyearling Chinook study design must include prerequisite studies to clarify the relationship between water temperatures during capture, handling, tagging, and releasing, and subsequent performance of tagged individuals. Despite promising advances in tag technology, tagging a representative sample of the population remains impossible because of the size distribution of the population above Wells Dam and their availability to practical capture methods. Additionally, complex fish behavior prevents traditional study approaches because of multiple violations of model assumptions. No available analytical methods can rectify our inability to distinguish a fish that failed to migrate during the study period from a fish that died.

The Wells HCP CC discussed the information presented at the 2024 Subyearling Workshop at their June 25, 2024 meeting at Wells Dam, identifying the need for continued and regular discussions to process multiple unresolved questions and to discuss the path forward towards implementing a subyearling Chinook survival study. Primary questions for continued discussion include: 1) representative sampling, both in space and time, which is a function of fish availability given practical collection methods/locations and fish sizes present during the course of a representative study; 2) fish behavior while within the respective projects, which affects study timing, duration, and methods; 3) tag technologies and the intersection of those technologies with the representative-sampling and fish-behavior questions described above; 4) HCP requirements and specified approaches and how to meet those or whether to accept alternate approaches and requirements for subyearling Chinook Salmon; and 5) analytical limitations and advances, and whether alternate models and/or study designs could resolve current limitations and provide estimates necessary for a determination of mitigation obligation. Douglas PUD's ultimate goal is to achieve Phase III (Standard Achieved) for subyearling Chinook Salmon. Therefore, any future study designs must produce a viable estimate of Measured Juvenile Project Survival that the Wells

HCP CC will approve. The HCP CC continues to discuss both the need for additional studies and how to measure project survival following the 2024 subyearling workshop.

In summary, the Wells HCP CC has approved a Calculated Dam Passage Survival estimate for subyearling Chinook Salmon at Wells Dam based on a technology encompassing the entire size and timing distributions of subyearling Chinook Salmon migrants, that provides evidence supporting the likelihood that the Juvenile Project Survival Standard (93%) is being met. Subyearling Chinook Salmon in the Wells Project area include a broad range of sizes and arrival/emergence timing, and duration of residency in the Wells Reservoir, and pass Wells Dam at all sizes within that distribution over a migration that spans months. Current tag technology allows the tagging of only a subset of the size distribution available on any sampling date, and collection methods do not allow the capture of size distribution observed passing Wells Dam on a given date. Even if tag technology allowed the tagging of the entire size distribution, and that entire size distribution could be captured, current battery life does not cover the observed period of residency in the Wells Reservoir. Complex fish behavior prevents traditional study approaches because of multiple violations of model assumptions. No available analytical methods can rectify our inability to distinguish a fish that failed to migrate during the study period from a fish that died. The Wells HCP CC has yet to determine how to conduct a survival study of subyearling Chinook Salmon in the Wells Project, and faces a list of difficult questions that the HCP CC parties must answer before they can approve a study capable of providing the Measured Juvenile Project Survival estimate required by the Wells HCP. In the meantime, and with the assurance provided by the Calculated Dam Passage Survival estimate that greater than 95 percent of subyearling Chinook Salmon survive passage of Wells Dam, the Wells HCP CC continues to monitor tag technology and advances in analytical approaches, and to discuss how to apply emerging advances to studying Juvenile Project Survival at the Wells Project. Until the Wells HCP CC can identify an appropriate study design capable of measuring Juvenile Project Survival for subyearling Chinook Salmon passing the Wells Project, Douglas PUD will continue to mitigate at the full 7-percent hatchery-compensation production rate necessary to maintain NNI.

#### Recommended Condition:

In effort to support LIHI's mission to support certification while balancing the interests of stakeholders and impacted resources, Douglas PUD suggest the LIHI's certification be condition as follows:

- 1) Douglas PUD will be required to annually provide LIHI with a copy of the HCP CC Annual Report documenting the status of subyearling Chinook studies at the Wells Project. The Annual Report will include all subyearling Chinook study-related documents that Douglas PUD shares with the HCP CC, including any future planned, ongoing, or completed subyearling Chinook life-history or survival studies.

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**WELLS HYDROELECTRIC PROJECT  
FERC PROJECT NO. 2149-WA**

**ATTACHMENT D**

**PACIFIC LAMPREY**

## **Pacific Lamprey**

The Pacific Lamprey Management Plan (PLMP) is one of six Aquatic Resource Management Plans contained within the Aquatic Settlement Agreement (Agreement) that the Public Utility District No. 1 of Douglas County (Douglas PUD) developed in close coordination with agency and tribal natural resource managers and participants of the Aquatic Settlement Work Group (Aquatic SWG). Active members in the Aquatic SWG include the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), Washington Department of Ecology (Ecology), Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation (CTCR), the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), and Douglas PUD.

The goal of the PLMP is to implement measures to monitor and address impacts, if any, on Pacific Lamprey resulting from the Project during the term of the new license. Douglas PUD, in collaboration with the Aquatic SWG, has agreed to implement several Pacific Lamprey PME's in support of the PLMP for the Wells Hydroelectric Project (Wells Project)

Beyond PLMP requirements, Douglas PUD has repeatedly demonstrated commitment to improving passage for Pacific Lamprey by completing both required license agreement tasks and activities outside of the Agreement. One of the biggest Pacific Lamprey projects that has been completed by Douglas PUD is a voluntary program to fund and carry out a large-scale Pacific Lamprey translocation program. In 2006, Pacific Lamprey returns to the Wells Project decreased significantly for unknown reasons. Pacific Lamprey populations in both the Methow and Okanogan rivers were greatly reduced and eventually the Okanogan population was functionally extirpated. Douglas PUD began a translocation program in 2018 that took fish from Priest Rapids Dam and placed them above Wells Dam (in the mainstem Columbia and into Okanogan River tributaries). Since 2018, Douglas PUD has translocated over 3,500 adult Pacific Lamprey, which has helped lead to the return of spawning lamprey in the Okanogan River, an increase in juvenile densities in the Methow River, and, since adults are drawn to juvenile pheromones, an increase in adult Pacific Lamprey that volitionally pass Wells Dam.

In the comments that were submitted to the Low Impact Hydropower Institute (LIHI) regarding Douglas PUD's application for certification, the WDFW, the Yakama Nation, and the Columbia River Inter-Tribal Fish Commission (CRITFC) all raised the issue of fish passage at the Wells Project. Specifically, commentors mention Pacific Lamprey and assert there is a lack of fishway modifications, and the Wells Project does not meet the LIHI's Agency Recommendation standard for upstream or downstream fish passage criteria.

### Pacific Lamprey Juvenile Downstream Passage Study

Yakama Nation and CRTIFC's comment letters both refer to the lack of downstream passage survival estimates and studies. The PLMP requires that "[d]uring the time of the new license, if tag technology and methodologies are developed and field tested and a sufficient source of

macrophthalmia<sup>1</sup> in or upstream of the Project are identified to ensure that a field study will yield statistically rigorous and unbiased results, Douglas PUD, in consultation with the Aquatic SWG, shall implement a one-year juvenile Pacific lamprey downstream passage and survival study” (PLMP 4.2.4). While technology being used on lower Columbia River projects, the tags are not yet commercially available and are only available for those organizations that helped fund the tag development (D. Deng, Pacific Northwest National Laboratory [PNNL] presentation to the Wells ASWG, see Rocky Reach Fisheries Forum, and Priest Rapids Fisheries Forum Meeting Minutes, June 5, 2024).

The Yakama Nation has been similarly critical of Public Utility District No. 1 of Chelan County (Chelan PUD) and requested that relicensing studies completed as part of the relicensing of Rock Island Dam include a downstream juvenile lamprey survival study. Chelan PUD disagreed stating that these studies are only now being piloted and no commercially available technology or methodology (statistics) exist (Chelan PUD 2024). The Federal Energy Regulatory Commission (FERC) agreed with Chelan PUD’s assessment stating that “the ELAT tag is an experimental technology that is not generally accepted and has not been proven reliable for quantifying survival rates at a hydroelectric project” (section 5.9(b)(6); Chelan PUD 2024). The FERC also stated that they did not believe “the information to be gained from the study would be sufficient to meet the study objectives of quantifying juvenile lamprey passage survival at the project” (section 5.9(b)(1); Chelan PUD 2024). Douglas PUD agrees with both Chelan PUD and the FERC that the state of the science and the unknown migratory behavior of juveniles currently prevents a statistically rigorous study at mainstem hydro projects.

Additionally, the PLMP requires that study fish be obtained from above the Wells Project. Currently, juvenile lamprey are incidentally caught upstream of the Wells Project in screw traps that operate in the Methow River, but at extremely low numbers (i.e. only 65 Pacific Lamprey juveniles in 2023; Douglas PUD 2024a). In the Aquatic SWG, Yakama Nation’s Pacific Lamprey biologist Ralph Lampman has proposed that at least 350 juvenile lamprey are needed for a downstream passage study at the Wells Project (Lampman 2023). With the increasing numbers of adult Pacific Lamprey migrating above the Wells Project, Douglas PUD expects that the potential source of juvenile lamprey will increase in upcoming years. Douglas PUD will continue to work with members of the Aquatic SWG to determine when both tags and appropriate numbers of juvenile Pacific Lamprey are available to complete this study.

### Fishway Passage and Modifications

In the Yakama Nation’s comment letter they state, “*Unachieved Pacific Lamprey passage requirements; the most recent passage efficiencies for adults was 23.5%.*” Additionally, the Yakama Nation’s comment letter states, “(Wells dam has a) *lack of appropriate fishway modifications to ensure that Wells Dam Fishways meet the regional standards for upstream passage of adult Pacific Lamprey*”. The PLMP requires Douglas PUD to complete an adult Pacific Lamprey upstream passage study and make modifications until passage rates are similar to other

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<sup>1</sup> *Macrophthalmia* are the juvenile life stage of Pacific lamprey, during which they migrate downstream from freshwater environs to the Pacific Ocean, analogous to a salmon smolt. *Ammocetes* (larvae) are a filter-feeding life stage that resides in riverine habitats, and adults migrate upstream to spawn and die.



mid-Columbia River hydroelectric dams (PLMP 4.1.6). Douglas PUD's most recent Wells Dam Adult Lamprey Approach and Passage Study was completed in 2023 and used both acoustic and PIT tags to assess adult Lamprey passage rates (Robichaud et al. 2024). In the recent comment letter from the Yakama Nation, the identified lamprey passage was incorrectly noted as 23.5%; in fact, this was the rate of all study fish that migrated above the Wells Project. Pacific Lamprey do not migrate to natal streams, instead they follow pheromones released by larval lamprey to find spawning areas. Study fish were released at two locations 46 km and 63 km downstream from the Wells Project and study fish may have been drawn to migrate to other tributaries, such as the Entiat and Chelan rivers, move downstream, or even stay in the mainstem Columbia River, as mainstem spawning immediately below Wells Dam on Carpenter Island is suspected but difficult to verify. Researchers have found that Pacific Lamprey create redds dominated by gravel, similar to habitat used by spawning salmonids (Mayfield et al. 2014) and Douglas PUD has documented Summer Chinook Salmon spawning on Carpenter Island immediately below Wells Dam (Schilling 2021). Of the acoustic tagged Pacific Lamprey that entered the Wells Project Tailrace, 29.2% entered the fishway. Of the fish that entered the fishway, 100% of the acoustic tagged fish and 95.5% of PIT tagged fish passed Wells Dam, indicating there are no within-fishway passage issues (Robichaud et al. 2024). With this study, Douglas PUD was unable to determine if tagged fish were not able to enter the fishway due to structural or velocity constraints or if there was not enough of a pheromone signal to encourage upstream migration. Douglas PUD's upcoming study in 2025, in consultation with the members of the Aquatic SWG, is proposing the use of radio telemetry to obtain more fine-scale on the fishway entrance area.

Additionally, the PLMP requires Douglas PUD to continue to identify ways to modify the fishways to improve upstream Pacific Lamprey passage (PLMP 4.1.4). It was suggested in the comment letters "*Upstream passage for adult Pacific Lamprey is not yet fully supported at the Project. ...which may not be a surprising given that recommended fishway modifications have not yet been fully implemented.*" All modifications that have been presented in the Aquatic SWG or when issues are identified, either by Douglas PUD staff or Yakama Nation biologists, the situation is remedied as quickly as possible. Often these modifications need to be accomplished during dewatering events and be scheduled around the Wells Project operation, but Douglas PUD continues to address any concerns presented by the Aquatic SWG members. Over the last 20 years, gaps have been filled and grating with large scaping has been replaced (see Douglas PUD Lamprey Studies Summary 2021 for example of upgrades). Furthermore, it should be noted that members of the Aquatic SWG are invited to help Douglas PUD inspect the fishway every year to help identify and remedy potential issues.

Yakama Nation commented on potential "false attraction" issues in the tailrace that might also affect Pacific Lamprey upstream migration. Douglas PUD has been proactive in working with Yakama Nation to find these areas and prevent the ability for lamprey to access non-fishway areas. Douglas PUD plans to utilize the upcoming radio telemetry study to determine the extent of lamprey use of non-fishway areas and if there are modifications that can be made to deter fish from entering these areas. It should be recognized that Douglas PUD has also completed many Pacific Lamprey passage studies in order to better understand if there are any areas of the fishway that are proving to cause problems in upstream migration. The next study, which will include studying lamprey interaction with the fishway entrance, will be completed in 2025 (Douglas PUD 2024b, Draft Pacific Lamprey Study Plan 2024).

In summary, Douglas PUD is proud of the work that has been completed to restore Pacific Lamprey in the upper Columbia Basin, to remedy passage issues at Wells Dam where identified, and is dedicated to continuing Pacific Lamprey research and management in the future. Translocation efforts, improved juvenile collection numbers in tributaries above Wells Dam and recent Wells Dam counts of adult lamprey all signal improvement for this important research.

#### Recommended Conditions

In effort to support LIHI's mission to support certification while balancing the interests of stakeholders and impacted resources, Douglas PUD suggest the LIHI's certification be condition as follows:

- 1) Douglas PUD is required to provide LIHI with a 2025/2026 Lamprey Radio Telemetry Report once approved by the Aquatic SWG
- 2) Douglas PUD is required to provide LIHI with an annual summary showing updated Pacific Lamprey Counts at Wells Dam count windows
- 3) Douglas PUD is required to provide LIHI with an annual summary of screw trap counts, where available, in the Okanogan, Methow and Twisp River Basin.

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