



State of Washington  
DEPARTMENT OF FISH AND WILDLIFE

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March 12, 2013

Mr. Kurt Beardslee  
Executive Director  
Wild Fish Conservancy  
P. O. Box 402  
Duvall, Washington 98019

Dear Mr. Beardslee:

Thank you for your letter regarding the SEPA Determination of Non-significance (DNS) issued January 4, 2013, for the Tokul Creek Hatchery Intake Diversion Dam and Fishway Replacement. The Washington Department of Fish and Wildlife (WDFW) has given consideration to each of the points included in your letter and responds below with some background information for context.

Background

The focus of the Tokul Creek Hatchery Intake/Fishway Replacement project is to provide fish passage and improvements at the intake that protect all fish near the facility. This project is the agency's on-going response to a 2003 Settlement Agreement between the Wild Fish Conservancy (WFC) (formerly Washington Trout). Since the "Section 206 / Water Resources Development Act (WRDA)" project devolved into a WDFW-alone capital project, the agency has kept the project and funding requests going forward to the State Legislature. Adequate funding for project construction became available in the summer of 2012 and thus the environmental review under SEPA began on a project viewed as generally beneficial for fish.

The diversion dam, the third project component, was under consideration for removal in the original Section 206 project. This dam is in large measure now responsible for controlling movements of the streambed and its destabilization is a significant concern to the Washington State Department of Transportation (WSDOT). The Army Corps of Engineers Hydraulic and Sediment Analysis of Sediment Transport of Dam Removal at Tokul Creek Fish Hatchery (2004) references this concern and is enclosed with DOT's Tokul Creek Dam Removal: Review of USACE Analysis/Impacts to the WSDOT Infrastructure and Available Countermeasures (2005).

The anticipated capital budget requests for the Tokul Creek Hatchery were posted incorrectly at the WDFW website. We appreciate you bringing these figures to our attention; the posting has been updated. The total for all Tokul Creek proposed projects, is just over five million dollars. Of that \$5 million, \$3.7 million is budgeted for this fish passage and intake improvement project.

Your concerns stated in the letter are essentially two-fold:

1. The first two and ½ pages of your letter address broad issues: the Habitat Action Implementation Plans (HAIPs), and Hatchery and Genetic Management Plans (HGMPs), related National Marine Fisheries Service (NMFS) actions, Puget Sound steelhead segregated hatchery fish, and the relative expense and value of the project. WDFW's Fish Program is most familiar with these issues you pose and responds in first section below, **Broader Issues**.

2. The remainder of your letter speaks more narrowly to structural design concerns. Our Capital and Asset Management Program coordinates input from our fish passage biologists, project engineers, consulting and regulatory agencies, and the public as projects go through permitting and construction phases. A second section, *Technical Design Questions* below, responds to the design issues you presented. We appreciate your concerns and comments and will incorporate good science-based suggestions within budgetary limits.

### ***Broader Issues***

WDFW has gone through an exhaustive review process of our hatcheries with federal agencies and the Hatchery Scientific Review Group (HSRG). That review process has led to operational changes implemented at Tokul Creek Hatchery to reduce the impacts of steelhead programs on natural populations and to prioritization of capital improvement projects to provide unimpeded access to additional habitat for Chinook salmon. The operational changes include elimination of off-station planting of steelhead smolts and a reduction since 2008 in hatchery steelhead released into the Snoqualmie River from 250,000 to 150,000 smolts. The prioritization of capital improvements led to this project in accordance with the settlement agreement in the Matter of Tokul Creek Chinook, Washington Trout and Public Employees for Environmental Responsibility v. Dr. Jeff P. Koenings and Washington Department of Fish and Wildlife, No. C02-1221 (W.D. Wash.).

Regarding the Habitat Action Implementation Plans (HAIPs), they were an important platform from which HGMPs began. As HGMPs became more important in the work with NMFS, WDFW spent more and more of their time working on HGMPs recognizing that completion of the HGMPs could occur before completion of the HAIPs. Since the submission of the HGMP for Tokul Creek Hatchery Steelhead in 2002, WDFW has been in consultation with NOAA regarding changes to programs or operations. These ongoing consultations informed the SEPA review and led to a DNS for this project. Currently, WDFW is in the process of submitting to NOAA updated HGMPs.

### ***Technical Design Questions***

- ***With the orientation of the upstream end of the fish ladder, is it assumed all outmigrants (kelts and juveniles) go over the dam or is it assumed that they will use the fish ladder? What is the basis for the assumptions made? Have those impacts been assessed?***

It was assumed outmigrants (kelts and juveniles) would go one of the two routes based primarily on water levels or quantities at the time they are present. During periods when water levels are relatively low the fish ladder would have to be used; and during very high water some fish would go over the dam. The design decision to locate the upper opening of the fishway and the Obermeyer weir in their respective locations is based upon the best technical information available including the WDFW Draft Fishway Guidelines for Washington State (2000) and the experience of the project's engineering team.

In the unlikely event that upper fishway opening would need to be relocated a modest investment in rebuilding this structure would be evaluated and accomplished if possible.

- ***If the dam pool is deep enough to receive outmigrants, is it also deep enough to encourage adults to try to leap the dam instead of using the ladder (false attraction)? Has this possibility been considered or evaluated?***

The dam pool will be deep enough to receive outmigrants. As such some adults, particularly steelhead, may try to leap the dam. The design is currently being modified to minimize this (false attraction) by increasing auxiliary attraction water in the openings of the fishway above the 10%

guideline to 14%, and possibly to 16%. We look forward to discussing this design change with scientists from WFC.

- ***What is to keep hatchery chinook / steelhead from ascending the fish ladder? If they will be able to ascend the ladder at will, have the implications for PHOS been evaluated?***

The proposed fish ladder would not be operated as a trap or sorting facility and will be open to passage at all times. The number of hatchery and natural origin fish present in the system is expected to be the same regardless of whether the ladder is operational or not. Therefore the PHOS will not increase as a result of having an operational ladder.

- ***Will upstream passage of natural-origin steelhead and Chinook be impeded at the ladder until the Hatchery's brood quota is attained? If so, have the impacts to wild steelhead been evaluated?***

No fish will be impeded at any point, as described in the answer above. The difference in the run timing of Chinook and winter steelhead is such that very little interaction occurs between the two. Any natural origin steelhead or Chinook captured at the hatchery as part of the broodstock collection effort will be returned to Tokul Creek. All hatchery origin fish will either be utilized as broodstock or dispatched for other outcomes such as nutrient enhancement, contribution to food bank programs or sale.

***Per WDFW Draft Fishway Guidelines for Washington State (2000), are the following conditions met?***

- ***Fishways must be designed for the smallest fish of the species requiring passage.***

***Pool volume*** will average 562 cubic feet during the 5% exceedence flow. Each pool will be 10 feet long and 8 feet wide, and water depth will be 7.03 feet during the 5% exceedence flow. According to NMFS Anadromous Salmonid Passage Facility Design (Feb. 2008), minimum water volume of the pools is 487 cubic feet.

***Fishway pool depth*** will range from 3.90 feet at the 95% exceedence flow to 5.28 feet at the 5% exceedence flow. According to DRAFT Fishway Design Guidelines (WDFW), a normal minimum recommended depth, at the upstream side of a slot, is 5 feet; some are commonly operated as low as three feet.

***Head differential*** between pools is 7.32' in the 95% exceedence flow and 7.20' in the 5% exceedence flow. According to DRAFT Fishway Design Guidelines (WDFW), recommended head differential between pools is 1.0 foot for most salmon and trout, 0.75 for chum and shad. According to WDFW Design of Road Culverts for Fish Passage, recommended maximum head drop in fishway is 9.6' for Adult Chum Salmon, Pink Salmon, and Trout.

***Freeboard*** from the water surface to the top of the wall is 4.4 feet in the 5% exceedence flow. According to DRAFT Fishway Design Guidelines (WDFW), freeboard should be a minimum of 3 feet for Chinook, steelhead, and coho.

- ***Passage should be provided for 90% of the migration period for the target species, and passage shall not be violated more than 100-hours during the migration season and for no longer than 24-hours at a time.***

The fish passage design for Tokul Creek Is based on the 95% and 5% exceedence flows, including the entire calendar year due to the presence of trout species and juveniles. The fish passage design must provide suitable fish passage conditions for the highest 5% exceedence value and the lowest 95% exceedence value.

Exceedence flows were calculated from USGS gage records for the Tokul Creek gage along with two similar watersheds located nearby. Based on the historical Tokul Creek data, these values would be 312 cfs and 19 cfs respectively. However, the Tokul Creek data may not be reliable

because operation of the gage was intermittent and was discontinued in 1945. Raging River and Taylor Creek are similarly sized basins located nearby the Tokul Creek basin and were used to estimate Tokul Creek exceedence flows by comparison. The USGS gages on Raging River and Taylor Creek have extensive continuous records. Both basins show similar patterns for the exceedence values relative to their respective basin areas, so the highest 5% exceedence values (Nov. 1 – Jan. 31) were selected for comparison to Tokul Creek. Averaging the flow per square mile of basin area values for the two basins and applying the result to the Tokul Creek basin area results in a maximum 5% exceedence flow of 780 cfs. This appears to be a very conservative estimate compared to the largest 5% exceedence value calculated from the Tokul Creek historical data. Performing the same operation for the 95% exceedence yields a minimum 95% exceedence value of 22 cfs, which is slightly greater than the corresponding value calculated using the Tokul Creek historical data.

The fish passage design for Tokul Creek uses a minimum 95% exceedence flow of 22 cfs and a maximum 5% exceedence flow of 780 cfs.

***• Avoid distractions such as spilling water or jets of water that effectively lead fish away from fishway entrances.***

The fishway entrance is located at the downstream edge of the weir, as far upstream as possible. A low flow entrance will be provided which directs entrance flow perpendicular to the stream flow, and a high flow entrance will be provided to direct entrance flow at an angle of 30 degrees from perpendicular. During the 95% exceedence flow, the fish passage entrance flow will be 100% of the flow in the stream. During the 5% exceedence flow, the fish passage entrance flow will be 7.3% of the flow in the stream.

The angled high flow fish passage entrance will cause the water jet to penetrate the tailwater of the weir to a greater extent than a perpendicular entrance would. The high flow fish passage entrance will be placed on a protruding wall which will create a velocity shadow downstream of the entrance along the north bank of the stream, enhancing the ability of fish to find the fish passage entrance during high flows in the stream.

Both entrances are designed to create streaming flow conditions conducive to passage by pink and chum salmon.

***• Avoid exit location next to the spillway or powerhouse intakes. Locate the exit on a bank-line that will guide fish upstream rather than in the center of the channel. Extend the exit channel upstream if necessary to locate the exit in an area of consistent positive downstream flow.***

The center of the fishway exit is located on the north bank of Tokul Creek, approximately 20 feet from the weir crest. This location of the fishway exit balances the need for the entrance to be as close to the attractant waters of the weir spillway during moderate to high flow periods with the need for the exit channel to be in the area of positive downstream flow which will be concentrated near the weir crest on the north bank during low flow periods. In the case at Tokul Creek, the fishway exit must be relatively close to the weir to experience consistent positive downstream flow - during low to moderate flow periods.

During the 5% exceedence fish passage flow (780 cfs), the velocity of streamflow along the north bank immediately upstream of the fishway exit will be 3.2 feet/second, which is within the guidelines for velocity near the fishway exit established by NMFS Anadromous Salmonid Passage Facility Design (February 2008). The position of the intake screens, set back from the

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fishway exit channel, is designed to meet juvenile criteria for sweeping flow and approach velocity.

The exit location is within 5 feet of ordinary high water (OHW) on the creek's right-bank where the OHW-OHW width is over 60 feet and is therefore close to a guiding bank-line and will consistently have a positive downstream flow.

**• Was a roughened channel considered as an alternative to rebuilding the diversion dam? Have the hydrologic impacts of climate change been considered and have these considerations informed consideration of alternative water sources and technologies such as recirculation? What alternatives were assessed before coming to rest on the approach to rebuild the dam?**

A roughened channel design across the bankfull width of Tokul Creek was not considered due to serious concerns expressed by the Department of Transportation (see the ACOE and DOT reports referenced on page one). A roughened channel-type of fishway was considered early on in the project design phase. This design, also based on the fishway guidelines from WDFW and NMFS, had no successful precedent therefore a more traditional pool and vertical slot fishway has been approved to go forward.

Climate change impacts have been incorporated in the thinking with higher volumes being accommodated in the fishway design and 500-year floods calculated into the diversion dam designs.

The integrity of the diversion dam has been compromised by recent high water events especially the flood in December 2008. Referenced above this is a significant concern to DOT. The area below the footing has eroded where the plunge pool would be located. Therefore the pool is longitudinally bifurcated.

WDFW has considered your comments regarding the project's potential to have a significant adverse impact and believes the project will likely not have a significant adverse impact on the environment and that it has been properly evaluated under the SEPA.

We acknowledge the role the WFC has had in elevating the importance of wild fish and their habitats. Assuring fish passage in Tokul Creek is an example of the tireless work by WFC.

Please review our responses and get back to us with any comments or suggestions.

Sincerely,



Douglas Mackey  
Fish and Wildlife Biologist  
Washington Department of Fish and Wildlife

cc: Mark Hersh, WFC, Water Quality Specialist

Enclosures (2):

*Hydraulic and Sediment Analysis of Sediment Transport of Dam Removal at Tokul Creek Fish Hatchery (2004)*  
*Tokul Creek Dam Removal: Review of USACE Analysis/Impacts to the WSDOT Infrastructure and Available Countermeasures (2005)*

