United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

MAR 29 2016

In Reply Refer To:
01EWFW00-2016-I-0500
01EWFW00-2016-I-0511

Robert P. Jones, Jr.
Chief Anadromous and Inland Fisheries Program
Sustainable Fisheries Division
National Marine Fisheries Service
Seattle, Washington 98115

Dear Mr. Jones:

Subject: WDFW Early Winter Steelhead Hatchery Programs in the Snohomish and Stillaguamish River Basins

This letter is in response to your correspondence dated February 24, 2016 and March 3, 2016, requesting concurrence with "may affect, not likely to adversely affect" determinations for the bull trout (*Salvelinus confluentus*) and designated bull trout critical habitat associated with the continued operation of Washington Department of Fish and Wildlife (WDFW) Early Winter Steelhead (EWS) hatchery programs in the Snohomish and Stillaguamish River watersheds. The letters were received in our office on March 1, 2016 and March 3, 2016, respectively. In addition, in an email dated March 4, 2016, the National Marine Fisheries Service (NMFS) requested concurrence with a "may affect, not likely to adversely affect" determination for the marbled murrelet (*Brachyramphus marmoratus*) associated with these programs.

The NMFS has determined that the action will have "no effect" on the northern spotted owl (*Strix occidentalis caurina*). The determination of "no effect" to listed resources or critical habitat rests with the action agency. The U.S. Fish and Wildlife Service (Service) has no regulatory or statutory authority for concurring with a "no effect" determination, and no consultation with the Service is required. We recommend that the NMFS document their analysis on effects to the northern spotted owl and maintain that documentation as part of the project file. This informal consultation has been conducted in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(ESA).

The NMFS is proposing to authorize WDFW's EWS programs under Limit 6 of the ESA section 4(d) rule for listed salmon and steelhead (50 CFR 223.203(b)(6)). Limit 6 allows for exemption of take of listed species associated with joint state and tribal fishery management plans developed under the United States v. Washington or United States v. Oregon settlement process. For take to be exempted under Limit 6, the joint fishery management plans must meet specific criteria and be subject to NMFS review and authorization. The NMFS proposes to determine that WDFW's EWS programs operated in the Snohomish River basin at the Wallace Hatchery, Reiter Ponds, and Tokul Creek Hatchery facilities, and at the Whitehorse Ponds facility in the Stillaguamish River basin, are consistent with Limit 6. The proposed hatchery operations will affect bull trout, bull trout critical habitat, and the marbled murrelet.

The NMFS has provided sufficient information to determine the effects of the proposed actions and to conclude whether the actions are likely to adversely affect federally listed species and designated critical habitat. Our concurrence is based on information included in the request for concurrence, the Snohomish River Basin Hatchery Activities Biological Assessment (dated December 24, 2014 and updated March 4, 2016), the Whitehorse Ponds Hatchery Biological Assessment (dated March 18, 2015), and additional correspondences in the form of emails and telephone calls with NMFS and WDFW staff. Our concurrence is based on information provided by the NMFS and WDFW, and best available science.

The duration of this consultation is 5 years from the date that the NMFS permit is issued, at which point consultation on these actions must be reinitiated.

Effects to Marbled Murrelet

Effects to marbled murrelets at the Whitehorse Ponds (Stillaguamish) and the Wallace Hatcheries (Snohomish) are considered discountable due to lack of suitable habitat in the vicinity of these hatchery facilities.

EWS operations associated with the Reiter Ponds (Snohomish) and Tokul Creek (Snohomish) facilities are adjacent to a limited amount of marginally suitable nesting habitat. We do not expect sound levels generated from hatchery operations to measurably exceed background levels in the adjacent forested areas for the reasons identified below. The Tokul Creek facility is located adjacent to a busy thoroughfare (Hwy 202) with hatchery operations occurring between the hours of 8 am to 5 pm. Typical noise-generating activities at this facility include grounds maintenance (e.g., lawn mowing and trimming), operation of personal motor vehicles, and occasional use of heavy equipment (e.g., cleaning out ponds). Sound levels from routine activities are very similar to the traffic noise and will not exceed background levels in the adjacent forest stands. Furthermore, given the regular work times, no activities will be conducted at the facility during the primary feeding time of day (dawn and dusk hours).

The Reiter facility is a rearing pond located next to the Skykomish River and directly across the river from a residential development and the Stevens Pass highway. The pond and maintenance buildings are adjacent to a forested area that has been previously harvested and is marginally suitable (uniform young stand with very few large trees). Typical noise-generating activities at

this facility include grounds maintenance (e.g., lawn mowing and trimming), operation of personal motor vehicles, and occasional use of heavy equipment (e.g., cleaning out ponds). This facility also operates between 8 am and 5 pm.

Although some elevated sound levels associated with routine activities at both of these facilities could extend into marginally suitable habitat, based on the location and marginal condition of the habitat, it is extremely unlikely that the stands adjacent to these facilities are used by marbled murrelets for nesting. In addition, these facilities have existed in their current locations for at least 30 years. Human presence and activities are conducted year-round at both of these facilities. Given the setting (rural residential, next to highways), we anticipate that any marbled murrelets that might be nesting in the forested areas adjacent to these facilities likely are accustomed to the low-level noises and other disturbances related to hatchery operations, nearby developments and traffic on the highways. No mature trees will be cut and the operations will not affect suitable habitat. Because temporary exposures and effects from the action are not expected to measurably disrupt normal marbled murrelet behaviors while in the terrestrial environment, effects to nesting marbled murrelets are considered insignificant.

Effects to Bull Trout

Hatchery Facilities

The Wallace Hatchery is located in the community of Gold Bar at the confluence of May Creek and the Wallace River, approximately 4 miles upstream of the Skykomish River. The Reiter Ponds facility is located near the town of Index on the upper Skykomish River. Bull trout in the Skykomish River basin include anadromous and resident populations that exist in the upper watershed. The nearest spawning and early juvenile rearing areas are 12 miles or more miles upriver from Reiter Ponds in tributaries to the North and South Forks of the Skykomish River. The Reiter facility is the highest up in the Skykomish River watershed and closest to spawning habitat. There is no spawning habitat in the Wallace River. Both the Wallace and Reiter facilities are located adjacent to foraging, migrating, and overwintering habitat. Therefore, foraging, migrating, and overwintering adult, subadult, and larger juvenile bull trout are the only sizes and life history stages that may be directly exposed to the facilities and their operations. Bull trout observations in the Wallace River subwatershed have been sporadic and few.

The Tokul Creek facility is located adjacent to the Snoqualmie River. Although the river is used seasonally by bull trout for foraging and overwintering, there is no known bull trout spawning in the Snoqualmie River watershed. Both adult and subadult bull trout are occasionally observed in the Snoqualmie River. These fish are likely migrants from the Snohomish River which is over 45 miles downriver from Tokul Creek. The closest spawning habitat is more than 60 miles away in the Skykomish River.

The Whitehorse Ponds Hatchery is located on Whitehorse Spring Creek, a small tributary to the North Fork Stillaguamish River at River Mile (RM) 28. This area of the Stillaguamish is used by bull trout for foraging, migrating, and overwintering. The closest known bull trout spawning population is in Deer Creek, which has a confluence with the North Fork Stillaguamish River at RM 14.3, or about 14 miles downstream of the hatchery location. Bull trout spawning has been

documented above RM 16 in Deer Creek. Adult bull trout have been observed in the North Fork Stillaguamish River, inclusive and above the Boulder River confluence, and the Squire Creek drainage (USFWS 2004, p. 97). However, these fish are suspected to be strays, colonizing individuals, and/or fish foraging from other core areas (USFWS 2004, pp. 3-4; USFWS 2015, p. A-149). There has been no extensive juvenile sampling or spawning surveys with the exception of snorkel surveys in Boulder Creek, which did not document any juvenile bull trout. Since 1943 when spawning surveys began, and continuing through the present, there have been no observations of bull trout spawning in the North Fork Stillaguamish River watershed outside of Deer Creek (Whitney, in litt. 2015).

Broodstock Collection Infrastructure and Incidental Capture and Handling

No bull trout have been encountered during broodstock collection or any other hatchery activities at any of the facilities associated with these EWS programs. Broodstock is collected through volitional entry into off-channel collection ponds at the Reiter Ponds and Tokul Creek facilities. Weirs and associated in-stream traps used for EWS broodstock collection are in areas that are used by very few or no bull trout. These include a weir and trap on May Creek (Wallace Hatchery) and a weir and trap on Whitehorse Spring Creek (Whitehorse Hatchery). No bull trout have been documented in these streams, nor have any bull trout ever been captured in the weirs or traps. Bull trout appear to use the Wallace River (Wallace Hatchery) and the North Fork Stillaguamish River (Whitehorse Hatchery) in relatively low numbers, especially during the time of year when broodstock are returning to the hatcheries. No bull trout have been captured or observed in any of these facilities. Very few, if any, bull trout are expected to enter the tributary streams with weirs and traps used for EWS broodstock collection. Any bull trout that may have entered these streams have refused to enter the traps. For these reasons, the probability that a bull trout will be captured at in-stream traps or enter broodstock collection facilities during the term of this consultation is extremely small, and therefore discountable.

Effects to Bull Trout Forage Base

Weirs and instream structures (like traps) may block access to a relatively small amount of foraging habitat upstream of the facilities. The very few bull trout that may be prevented from foraging upstream of the facilities (especially during the time of year when they are operating) have easy access to more abundant and higher-quality foraging habitat nearby. Therefore, we expect the obstructions caused by seasonal operation of weirs to have insignificant effects to bull trout.

The EWS programs will provide a direct, albeit small and temporally limited, forage resource to bull trout in freshwater habitats. Juvenile steelhead trout are fairly large (approximately 200 mm in length) when they are released from the hatcheries. Thus, only larger adult bull trout would be able to consume fish from these programs due to the relatively large body size of the hatchery fish (Keeley and Grant 2001, p. 1126; Lowery 2009, pp. 48, 57). Furthermore, the relatively rapid out-migration of hatchery-released juvenile steelhead to the marine environment restricts their temporal availability to bull trout as a prey resource in the river. In nearshore marine habitats, bull trout appear to rely primarily on surf smelt (*Hypomesus pretiosus*), Pacific herring (*Clupea pallasii*), and Pacific sand lance (*Ammodytes hexapterus*) for forage, although some

juvenile salmonids, including coho salmon (*Oncorhynchus kisutch*), may also be consumed (Goetz et al. 2004, pp. 101-114). Steelhead trout have not been documented in bull trout diets while in the nearshore (Goetz et al. 2004, pp. 101-114).

The EWS programs are designed to minimize the abundance of hatchery-origin spawners in the wild. Although some straying and natural spawning will occur, this is expected to be minimal, thus providing a very small benefit to bull trout from eggs, naturally-reared juveniles, and stimulation of ecosystem productivity. Hatchery-origin steelhead may negatively affect fitness and abundance of naturally-reproducing steelhead populations, which likely provide a more important forage resource to bull trout in the freshwater environment than the limited amount of juveniles produced by the EWS programs. The naturally-reproducing populations of steelhead trout in the Snohomish and Stillaguamish watersheds belong to the Puget Sound Steelhead Trout Distinct Population Segment, which was listed as threatened in 2007. As listed entities under NMFS jurisdiction, the NMFS consultations evaluated effects of the WDFW hatchery programs on these populations (NMFS 2016a; NMFS 2016b). The NMFS consultations concluded that the hatchery programs will not appreciably reduce the likelihood of survival and recovery of the listed entity in the wild. Further, each of the NMFS consultations imposes mandatory Reasonable and Prudent Measures and Terms and Conditions that ensure the WDFW hatchery programs minimize the amount and extent of take of listed, naturally-reproducing steelhead trout in the Snohomish and Stillaguamish watersheds (NMFS 2016a; NMFS 2016b). In addition, the NMFS will monitor these activities, and data collected, to ensure that the activities viewed as having potentially negative effects on steelhead trout are reduced in effect or adjusted to further reduce effects. The NMFS will also monitor emerging science and information related to interactions between hatchery fish and fish from natural populations and will consider if re-initiation of consultation with the WDFW is required in the event that new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in the existing consultations. For these reasons, we conclude that any effects of the hatchery programs on limiting or suppressing the abundance of naturally-reproducing populations of steelhead trout, and by extension the bull trout forage base, are considered insignificant.

Hatchery weirs on Whitehorse Spring Creek (Whitehorse Hatchery) and May Creek (Wallace Hatchery) and hatchery water supply diversion dams on Austin Creek (Reiter Ponds), Hogarty Creek (Reiter Ponds), and Tokul Creek (Tokul Hatchery) prohibit or present partial obstructions to adult salmonids migrating upstream. Limiting access to spawning habitat may reduce the bull trout forage base provided by juvenile salmonids. Hatchery water withdrawals, which reduce flows in source streams between the withdrawal and discharge points, may also reduce the quantity of rearing habitat and thus juvenile abundance in these partially dewatered reaches. Hatchery surface water intake screening at all facilities except the Whitehorse Ponds Hatchery meet 1995 and 1996 guidelines (NMFS 1995; NMFS 1996), but do not meet current guidelines (NMFS 2011a) and may therefore not adequately protect juvenile salmonids. Intake screening at the Whitehorse Ponds Hatchery is consistent with current guidelines. These limitations to abundance and productivity of juvenile salmonids are expected to represent a very small proportion of the overall abundance and productivity within the Snohomish and Stillaguamish watersheds for the following reasons: 1) the portions of all streams above the hatchery barriers that provide suitable spawning habitat for salmonids are relatively short, with the exception of

May Creek; 2) wild salmonids, except Chinook salmon (*Oncorhynchus tshawytscha*), are passed above the barrier on May Creek, 3) a fish ladder will be added to the Tokul Creek dam which will allow fish passage by 2017 (USFWS Reference 01EWFW00-2014-I-0369) (NMFS 2016b); and 4) screening at the Wallace River and Tokul facilities will be in compliance with current guidelines by 2017 (NMFS 2016a; NMFS 2016b). In addition, only migratory adult and subadult bull trout would be affected by these minor and localized reductions in the forage base. These fish are expected to easily access more abundant forage resources nearby. For these reasons, effects to bull trout associated with minor reductions in their forage base from hatchery infrastructure and water withdrawals are considered insignificant.

Inter-specific Competition and Predation

The potential for ecological interactions between hatchery-origin EWS and vulnerable size classes of bull trout is considered discountable because the locations, life stages, and timing of EWS smolt releases make temporal and spatial overlap with juvenile or small bull trout extremely unlikely. EWS smolts are released 12 miles or more downstream of any early juvenile bull trout rearing areas. Some of the released EWS smolts migrate past tributaries used by bull trout for spawning and early juvenile rearing; however, these tributary spawning and early juvenile rearing areas are 13 miles or more upstream from mainstem rivers and migratory pathways used by hatchery steelhead. EWS smolts are typically released between mid-April and early-May, and most emigrate seaward within a few weeks of release (Goetz et al. 2008; Moore et al. 2010; NMFS 2016a; NMFS 2016b). Newly released EWS smolts might encounter larger juvenile or subadult bull trout downstream of the hatcheries for a brief period in the spring and early summer months; however, any effects of these potential encounters are expected to be insignificant due to the larger size of bull trout and their diet preference differences at that age (Lowery and Beauchamp 2015; Davis 2015). Incubation time and fry emergence timing of bull trout in the Skykomish and Stillaguamish basins are not known with certainty. Based on information from other watersheds, fry likely emerge from May through July after most hatchery EWS have moved into marine habitats. Additional research indicates that EWS smolts typically do not feed during the first week after release. Juvenile outmigrant trapping data indicate bull trout that are present in lower watershed areas in other Puget Sound watersheds are too large to be preyed upon by EWS smolts.

A small proportion of released EWS smolts may residualize and remain in freshwater habitats for an extended period of time. There are no data on residualization or movement for fish associated with these programs. A meta-analysis of steelhead hatchery programs (mostly in the Columbia River basin) found that steelhead yearlings residualize at an average rate of 5.6 percent, with a range of 0 to 17 percent (Hausch and Melnychuk 2012). Lower rates were associated with the following: hatchery-derived broodstock; acclimation and volitional release; and intermediate size of released fish (approximately 213 mm FL). The Snohomish and Stillaguamish programs implement these and other measures to minimize risk of residualization. In addition, bull trout spawning and rearing areas are 12 miles or more upstream from steelhead release points and migratory pathways. Available information suggests that any residualized steelhead are extremely unlikely to move that far upstream from their natal areas (Partridge 1986, p. 29; McMichael and Pearsons 2001, p. 945; Brostrom 2006).

It is generally believed that bull trout fry and subyearlings remain relatively near spawning areas to rear, and that downstream movement does not begin until fish are yearlings or older (McPhail and Baxter 1996, p. 16). Some downstream movement of young juveniles can be expected due to density-dependent displacement and/or displacement from high flow events (Goetz 1989, p. 24-25; McPhail and Baxter 1996, p. 16; Bellerud et al. 1997, p. 36-49; Downs et al. 2006, p. 198). The possible existence of intentional downstream fry or subyearling outmigrations is unknown (e.g., Mesa et al. 2008, p. 71). Limited evidence suggests that bull trout fry and subyearlings in the Skykomish and Stillaguamish River watersheds do not move or rear far from the spawning areas. There are no records or anecdotal accounts of bull trout fry or subyearling-size fish being captured in mainstem river smolt traps in the Snohomish or Stillaguamish River watersheds. Conversely, yearlings and larger bull trout are routinely captured in the smolt traps. In the Skykomish and Stillaguamish River basins, physical habitat conditions and summertime water temperatures become less favorable for juvenile bull trout downstream of the spawning areas. Thus, most or all early juvenile rearing is expected to occur in the upper watershed areas away from EWS smolt migratory corridors and EWS residuals. For these reasons, we expect that competition and predation of bull trout associated with hatchery-released EWS smolts is considered discountable.

Some returning adult hatchery-origin EWS may stray and spawn naturally in the watersheds. Winter steelhead spawn later in the season than bull trout; therefore, there is no threat of spawning ground competition. However, should any steelhead spawn in the same areas as bull trout, bull trout redds may be disturbed or destroyed prior to fry emergence. Hatchery-origin fish that spawn naturally generally do so in close proximity to their release point or the facility where they were acclimated or imprinted on, usually a hatchery or acclimation pond (Quinn 1993; Mackey et al. 2001; Hoffnagle et al. 2008; Dittman et al. 2010; Williamson et al. 2010). For example, Mackey et al. (2001) observed that 75 percent of steelhead hatchery strays in a Willapa River, Washington tributary stayed within 1 mile of their smolt release point. In the Snohomish and Stillaguamish River basins, the closest bull trout spawning habitat is 12 miles or more upriver from EWS rearing and release points and migratory pathways. Hatchery practices that minimize the abundance and spatial extent of strays to the greatest extent possible are implemented by the EWS programs and include the following: 1) rearing and releasing the fish at the same location; 2) keeping adult collection ponds open for the entire run time to remove all returning hatchery steelhead; and, 3) using only hatchery-origin fish for broodstock. In addition, hatchery EWS are reared, acclimated, and released from facilities that use water from sources (tributaries, springs, or groundwater) 12 miles or more away from the closest bull trout spawning areas. Imprinting by EWS on these sources is expected to further minimize the potential for straying up into the tributaries and headwater areas where bull trout spawn. Hatchery-origin strays are thus extremely unlikely to migrate to bull trout spawning areas. Furthermore, no hatchery steelhead have been documented during surveys conducted by the WDFW in areas where bull trout spawn (Whitney, in litt. 2015). For these reasons, we conclude that superimposition or scour of bull trout redds by hatchery EWS is considered discountable.

Surface and Groundwater Water Withdrawals and Diversions

Water withdrawals for use by the EWS programs are spring, well, or surface water from tributaries that bull trout are believed to not use or use in very low numbers. At the Wallace Hatchery, water is returned to the river within 200 feet of the withdrawal intake. Because there currently is no gage on the Wallace River, there are no discharge data available for the river. However, there are no data or anecdotal accounts to suggest that water withdrawals diminish water quantity within this small area to the extent that juvenile or adult salmonids, including bull trout, would be adversely affected. Few bull trout are believed to use the Wallace River. Water that is withdrawn from May Creek is returned back to May Creek, so flows in the Wallace River are not affected. The May Creek withdrawal and return points are upstream of the May Creek weir and trap in areas that are inaccessible to bull trout. For these reasons, effects to bull trout associated with water withdrawal from the Wallace River and May Creek are considered insignificant and discountable, respectively.

Water used at the Reiter Ponds facility is from Austin and Hogarty Creeks. These withdrawals partially dewater the lower reaches of each of these creeks. Approximately 4.9 cubic feet per second (cfs) is withdrawn from each creek from October through May for the EWS program. Although the October start date coincides with the average end of the seasonal low flow period in the Skykomish River (USGS 2016a), low flow conditions may sometimes extend into October. Flows range between 1 and 100 cfs in Hogarty Creek, and between 7 and 300 cfs in Austin Creek. Water withdrawals during low flow conditions may limit bull trout access into these creeks, and limit the quantity and quality of habitat. However, bull trout are not known to use either of these creeks. In addition, the total length and quantity of habitat in these creeks affected by water withdrawals is small compared to other available nearby habitat. Austin Creek water is returned to the Skykomish River approximately 3,900 feet downstream of the mouth of Austin Creek. The volume of water withdrawn from Austin Creek is a small proportion of Skykomish River flow at median low flow (0.6 percent) and periodic extreme low flow (1.6 percent) conditions (USGS 2016a). Therefore, withdrawal of water from Austin Creek will have no measurable effect to bull trout in the Skykomish River. For these reasons, effects of water withdrawal from Hogarty and Austin Creeks are considered insignificant.

Water used at the Tokul Hatchery comes from Tokul Creek. The hatchery water withdrawal partially dewaters 1,500 feet of the creek (distance between intake and lowest outlet). Approximately 5.4 cfs is withdrawn for the EWS program. Although there is no gage on this creek, historical data suggest that flow in the creek is 25 to 30 cfs during seasonal low flow conditions in August and September, and about 90 to 200 cfs from November through May (USGS 2016c). Water withdrawal during low flow conditions may limit bull trout access into and above the partially dewatered reach, and limit the quantity and quality of habitat. However, bull trout are not known to use Tokul Creek, and any potential use of the creek is likely minimal. In addition, the total length and quantity of habitat in Tokul Creek in and above the partially dewatered reach is small compared to other available habitat in the Snoqualmie River. For these reasons, effects of water withdrawal from Tokul Creek are considered insignificant.

Water withdrawn for use in EWS production at the Whitehorse Ponds Hatchery is supplied from the spring-fed Whitehorse Spring Creek, which originates 200 yards above the facility. A well also supplies 1.1 cfs of groundwater for hatchery fish propagation. A maximum of 5.6 cfs of surface water may be withdrawn from the creek for hatchery use during the spring months, when the needs are highest (rearing juvenile fish). All water is returned to the creek near the point of withdrawal, resulting in no net reduction in flow within the creek. Bull trout have not been documented in Whitehorse Spring Creek, and are not expected to use the creek because it is very small (less than 6 cfs at maximum flow) and shallow. Because water withdrawn from Whitehorse Spring Creek is returned back to the creek, there will be no reduction in the volume of water that reaches the North Fork of the Stillaguamish River. Therefore, effects of water withdrawal for the EWS program are expected to be insignificant.

Hatchery surface water intake screening at all facilities except the Whitehorse Ponds Hatchery meet 1995 and 1996 guidelines (NMFS 1995; NMFS 1996), but do not meet current guidelines (NMFS 2011a) and may therefore not adequately protect juvenile salmonids (NMFS 2016a; NMFS 2016b). Intake screening at the Whitehorse Ponds Hatchery is consistent with current guidelines. Screening at the Wallace and Tokul facilities will be in compliance with current guidelines by 2017 (NMFS 2016a; NMFS 2016b). Only adult, subadult, and larger juvenile bull trout will be exposed to intake screens at these facilities. Because the potential for exposure is extremely low for larger size class fish, effects of screening at the Wallace and Tokul facilities to bull trout are considered insignificant.

Bull trout will not be exposed to hatchery facility intake screens in Austin Creek (Reiter Ponds) because the intakes are located upstream of an anadromous barrier. Bull trout are not known to use Hogarty Creek (Reiter Ponds) and its small size and limited flows make it unlikely that bull trout would use it. Only the larger adult and subadult bull trout would possibly enter Hogarty Creek, as these are the only life history stages that use the Snoqualmie River. Because we do not expect bull trout to use this stream, the probability of exposure to the intake screening is considered discountable.

There may be some relatively small quantity of foraging habitat that water diversion structures in Hogarty (Reiter Ponds), Austin (Reiter Ponds), and Tokul Creeks obstruct bull trout access into. Any bull trout that may be blocked from entering these habitats are expected to easily access more abundant and higher-quality foraging habitat nearby. In addition, a fish ladder will be added to the Tokul Creek dam which will allow fish passage by 2017 (USFWS Reference 01EWFW00-2014-I-0369) (NMFS 2016b). For these reason, such obstructions will have only insignificant effects to bull trout.

Discharge of Hatchery Effluent

Hatchery operations require the use and discharge of surface and well water into streams adjacent to the operating facilities. Hatchery water discharge may affect several water-quality parameters in the aquatic system. Hatchery facility waste products may include uneaten food, fish waste products (i.e., fecal matter, mucus excretions, proteins, soluble metabolites such as ammonia), chemotherapeutic agents (e.g., Formalin), cleaning agents (e.g., chlorine), drugs and antibiotics, nutrients (e.g., various forms of nitrogen and phosphorus), parasitic microorganisms,

and algae. Some of these waste products are in the form of suspended solids and settleable solids, while others are dissolved in the water. Water temperature may increase and dissolved oxygen decrease as water flows through hatchery raceways and holding ponds. Maintenance activities, such as vacuuming and removal of accumulated sediment on the bottoms of hatchery ponds and raceways, may temporarily elevate the concentration of some contaminants in the hatchery water system.

Hatchery effluent is discharged from the EWS hatchery facilities consistent with National Pollutant Discharge Elimination System (NPDES) permits (WAG13-3008 for Whitehorse; WAG 13-3004 for Tokul Creek Hatchery; WAG 13-3006 for Wallace River Hatchery; and WAG 13-3005 for Reiter Ponds) issued by the Washington Department of Ecology. Chemotherapeutic agents are used in accordance with Food and Drug Administration and American Fisheries Society guidelines, and cleaning agents are used at lowest effective concentrations.

Under the NPDES permits, the Snohomish and Whitehorse facilities discharge into settling ponds to remove suspended solids and settle-able solids before the water is released back into the Snohomish and Stillaguamish Rivers. Required monitoring indicates that these measures are effective at substantially minimizing the release of uneaten food, fecal matter, and associated nutrients. In addition, river flow is generally high when fish are being reared in the ponds and effluent is being discharged. Thus, the effluent would be diluted rapidly near the point of discharge. For these reasons, we do not expect suspended solids or settle-able solids to measurably degrade or diminish habitat functions such as water quality or prey resources used by individual bull trout.

The existing NPDES permits do not specify discharge levels or monitoring requirements for dissolved oxygen. Dissolved oxygen must be maintained within the facilities at levels sufficient to support rearing salmonids. Thus, dissolved oxygen is not depleted to levels detrimental to juvenile salmonids. Furthermore, any decrease in dissolved oxygen is expected to be restored near the point of discharge because the discharge water volumes are small compared to the volume of water in the receiving waterbodies where bull trout may occur.

The hatchery facilities are relatively small and water passes through the facility only once prior to being discharged. The only exception is the Wallace Hatchery, where Wallace River water may occasionally be reused when flows in May Creek are low. Water temperatures at all of the facilities must be maintained cold enough to support rearing juvenile salmon. Thus, temperatures in the hatchery facilities do not rise to levels that are detrimental to juvenile salmonids. The opportunity for warming in rearing ponds prior to the water being discharged into the receiving waterbody is also very minor. For most of the facilities, the volume of water discharged from the hatchery facilities is relatively small compared to the volume of the receiving waters. For these reasons, warming is expected to be very minor and any impacts to water temperature in the receiving water bodies is expected to be ameliorated very near the point of discharge.

Most, if not all, chemicals used at hatcheries are used sporadically and in relatively low volumes. This is particularly true for chemotherapeutic agents, which must be used at levels that will not appreciably affect the fitness or survival of juvenile salmonids rearing at the hatchery. Bull trout may be attracted to or deterred from hatchery effluent at various times depending on the exact

physical and chemical properties of the effluent, which is determined by numerous factors including, but not limited to, chemicals in use at the hatchery, usage patterns, and the volume of rearing fish present. Any chemicals in the effluent are anticipated to be rapidly diluted near the point of discharge to the receiving waterbody. Although bull trout may detect and be exposed to chemicals in the effluent, we do not expect them to be exposed for durations or at concentrations that could result in injury or a significant impairment of their normal behavior. The likelihood of injury to bull trout from exposure to effluent is related to the frequency of occurrence, length of time they are exposed (e.g., how long bull trout remain in the immediate vicinity of the effluent discharge points), and concentration of substances within the effluent water. Due to the sporadic nature of chemical and chemotherapeutic use, and the low concentrations that are commonly achieved at or very near the point of discharge, effects to bull trout associated with exposure to chemicals in the effluent are considered insignificant..

Bull trout are opportunistic predators that feed on the eggs and juveniles of anadromous salmon and resident fish. They likely locate profitable feeding areas using chemical cues left in the water by their prey. Effluent from the hatchery likely contains relatively high concentrations of these cues, and could serve as a feeding attractant to bull trout, which is rewarded only during the time of year when smolts are released. This "attractive nuisance" effect may keep bull trout from feeding as efficiently as they might if they were responding to feeding cues from natural readily available food resources. Bull trout are regularly documented below hatchery facilities in other locations during the time of year when hatchery fish are released. However, beyond these anecdotal observations, there are no data or evaluations documenting the scope and magnitude of these effects, or the extent to which this phenomenon may be detrimental to bull trout.

Pathogen Risk

Naish et al. (2008, p. 141-149) identify several mechanisms by which salmonid hatchery operations may affect pathogen risk to and disease status of naturally-reproducing or wild fish. Although these risks exist in theory, the authors note that:

> "...there are but a few well-documented cases in which hatchery fish have been shown to affect directly the health or infectious disease status of wild stocks. Nevertheless, this remains a considerable area of debate and a major source of scientific uncertainty requiring additional research"(Naish et al. 2008, p. 143).

Many of these risks, including the most severe, are precluded when hatcheries follow good fish health protocols and do not transfer fish to or from distant watersheds (Naish et al. 2008, p. 141-149); in the case of the WDFW facilities, these are referred to as fish health management zones. The hatchery programs are operated in compliance with "The Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State" protocols (WSTIT and WDFW 2006). These are science-based protocols for pathogen prevention, diagnosis, treatment, and control, and corresponding Best Management Practices for hatchery operations and sanitation practices. When implemented, these protocols help contain any pathogen outbreaks at hatchery facilities, minimize release of infected fish from hatcheries, and reduce the risk of fish pathogen transfer

and amplification to natural-origin fish (NMFS 2011b). High egg-to-smolt survival rates at the hatchery facilities - as reported in sections 9.1.1 and 9.2.1 of the HGMPs – are an indicator that these protocols are successful at containing disease outbreaks.

Disease and pathogen dynamics between hatcheries and naturally-reproducing fish is not well studied or understood (Naish et al. 2008, pp. 141-149, 166-167). However, based on the available information which suggests that hatchery operations managed in accordance with current science-based protocols (WSTIT and WDFW 2006) do not result in an increased risk of disease and pathogens to bull trout, we conclude that the risk of increased pathogen transmission and amplification is considered insignificant.

Maintenance Activities

Maintenance of hatchery equipment and infrastructure (e.g., weirs, fish ladders, holding ponds, raceways) occurs intermittently and during short time periods. Such maintenance may generate some disturbance from noise (equipment operation) and resuspension of fine sediments localized near the operation. The life history stages of bull trout exposed to these project effects are adults, subadults, and large juveniles. These fish are highly mobile and able to detect and avoid areas of disturbance. Any bull trout that may be in the vicinity can easily move around or pass through the sediment plume. Individuals that pass through the sediment plume will only be exposed to elevated levels of turbidity for a brief period (less than 1 hour), and are not expected to be measurably affected. Noise from heavy equipment is not expected to reach levels that would be harmful to bull trout. Therefore, direct effects to bull trout associated with short-term exposure to elevated levels of turbidity and/or noise from maintenance activities are considered insignificant.

Herbicides (primarily glyphosate-based chemicals) are used at many hatchery facilities to maintain landscaping and lawns. Herbicides are used in accordance with the manufacturer's label guidelines, and are applied during dry weather conditions (i.e., not raining) to prevent runoff into surface waters. Rodeo and/or Roundup are used around buildings and landscaped areas, and are not applied near water. A backpack sprayer is used for all applications. Approximately 2.5 gallons of Rodeo may be applied during summer months at the facilities. Tokul uses an additional 2.5 gallons of Roundup per year. Because herbicide use is relatively low and conservation measures are implemented to prevent chemicals from entering the water, effects to bull trout associated with the use of herbicide at EWS hatchery facilities is considered insignificant.

Other maintenance activities (e.g., building and grounds maintenance, painting, minor building repairs, lighting and fence repair, weeding and mowing) do not occur near water and are not expected to have any adverse effects to bull trout. Maintenance activities that may affect water quality of effluent (e.g., vacuuming and removal of accumulated sediment on the bottoms of hatchery ponds and raceways) are included in the subsection entitled *Discharge of Hatchery Effluent* above.

Effects to Bull Trout Critical Habitat

The final revised rule designating bull trout critical habitat (75 FR 63898 [October 18, 2010]) identifies nine Primary Constituent Elements (PCEs) (75 FR 63931-2) essential for the conservation of the species The proposed action may affect the PCEs listed below; however, effects to these PCEs are not expected to be measurable and are therefore considered insignificant or discountable:

PCE 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

Groundwater withdrawal at the Whitehorse Ponds (1.1 cfs) and Tokul (0.9 cfs) Hatcheries represent a small proportion (less than 1 percent) of the in-stream flow during seasonal low flow periods in the North Fork Stillaguamish (USGS 2016d) and Snoqualmie (USGS 2016b) Rivers, respectively. Groundwater used at the hatcheries is returned to the creeks near the point of withdrawal. Surface water withdrawals from the Wallace River (Wallace Hatchery) and Whitehorse Springs, May (Wallace Hatchery), Tokul, Austin (Reiter Ponds), and Hogarty (Reiter Ponds) Creeks are non-consumptive. Water withdrawn for these facilities is returned relatively close to the points of withdrawal. Because all of the water used at the EWS facilities is returned to the streams of origin close to where it is withdrawn, water use from these streams will have minimal, if any, effect on groundwater recharge. Use of spring water at the Tokul Hatchery is non-consumptive, and the water is discharged into Tokul Creek upstream of designated critical habitat in the Snoqualmie River. Hatchery water used in rearing ponds may contribute to minor warming of the receiving water body at the point of discharge. However, given the relatively small area of the mixing zone, effects to thermal refugia are not expected to be measurable. Because hatchery operations will not measurably affect groundwater sources, springs, or thermal refugia, effects to this PCE are considered insignificant.

PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

No weirs, traps or structures that could pose barriers to migration associated with the EWS facilities are located within designated bull trout critical habitat. Some very small, localized, and insignificant impacts to water quality and quantity may result from hatchery activities (see PCEs 1 and 8). Water withdrawn for hatchery use is discharged to receiving water bodies that flow into designated critical habitat. As described earlier under the effects to bull trout associated with potential exposure to chemicals in the effluent (*Discharge of Hatchery Effluent*) and incremental warming at the point of discharge, effects to water quality associated with EWS operations will not pose barriers to migration or preclude the function of this PCE. Therefore, effects to this PCE associated with impacts to water quality are considered insignificant.

PCE3: An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

Effects to this PCE are as described in the section *Effects to Bull Trout Forage Base* above. For the reasons described in that Section, effects to this PCE are considered insignificant.

PCE 4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

Bank armoring or construction activities that impact aquatic environments, shorelines, substrates or riparian vegetation are not routine hatchery operation and maintenance activities and are not proposed under this action. None of the normal operation and maintenance activities conducted at the EWS facilities will alter or affect this PCE.

PCE 5: Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; stream flow; and local groundwater influence.

Water temperatures at all of the EWS facilities must be cold enough to support rearing juvenile salmon. Thus, temperatures in the hatchery facilities do not rise to levels that are detrimental to juvenile salmonids. Minor warming may occur in rearing ponds prior to the water being discharged into the receiving waterbody. However, the volume of water discharged from the hatchery facilities is relatively small compared to the volume of the receiving waters and any incremental increase in temperature is not expected to be measurable beyond the mixing zones at the point of discharge. For these reasons, warming is expected to be very minor and will not impair or significantly affect this PCE.

PCE 6: In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young of the year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

The proposed activities and facilities are not in or near spawning and rearing habitat. Therefore, there will be no effects to this PCE.

PCE 7: A natural hydro graph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

Surface water withdrawals from May (Wallace Hatchery), Hogarty (Reiter Ponds), and Tokul Creeks and spring water withdrawal at the Tokul Hatchery are not in designated critical habitat, and withdrawn water is returned to each stream before reaching critical habitat. Therefore, these withdrawals will not affect flows or the natural hydrograph in those locations.

Surface water withdrawn from Austin Creek (Reiter Ponds) is returned to the Skykomish River approximately 3,900 feet downstream of the mouth of Austin Creek. The volume of water withdrawn from Austin Creek is a small proportion of Skykomish River flow at median low flow (0.6 percent) and periodic extreme low flow (1.6 percent) conditions (USGS 2016a). Therefore, withdrawal of water from Austin Creek will have no measurable effect on this PCE in the Skykomish River.

Surface water withdrawals from the Wallace River are returned within 200 feet of withdrawal. There are no data or anecdotal accounts to suggest that water withdrawals from the Wallace River affect the hydrograph within this small area to the extent that this PCE would be adversely affected. Therefore, effects to this PCE from Wallace River water withdrawals are considered insignificant. Similarly, groundwater withdrawals at the Whitehorse Ponds and Tokul Hatcheries are not expected to diminish instream flows or affect the hydrograph of the North Fork Stillaguamish or Snoqualmie Rivers, respectively, for the reasons identified in PCE 1.

PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

An insignificant decrease in water quality may result from the discharge of hatchery effluent into surface waterbodies. The area affected by discharges is relatively small and will not measurably impair water quality in the receiving water body. Chemicals and other hatchery-related pollutants in the effluent, slightly reduced dissolved oxygen levels, and minor increases in temperature (see PCE 5) will not alter water quality downstream of the facilities to a degree that would inhibit or measurably affect reproduction, growth or survival of bull trout or other salmonids downstream of any of the facilities. In addition, the discharge volumes are relatively small compared to the volumes of the receiving waterbodies in critical habitat. Surface, spring, and ground water used for EWS programs are expected to have insignificant effects to water quantity in critical habitat for the reasons described in PCE 7. For these reasons, effects to this PCE from the EWS programs are considered insignificant.

PCE 9: Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

The proposed actions are not expected to cause any increase or decrease in the presence of non-native predators or competitors. Therefore, the proposed actions will have no effect to this PCE.

Conclusion

This concludes consultation pursuant to the regulations implementing the Endangered Species Act (50 CFR 402.13). Our review and concurrence with your effect determination is based on the implementation of the project as described. It is the responsibility of the Federal action agency to ensure that projects that they authorize or carry out are in compliance with the regulatory permit and/or the Endangered Species Act, respectively. If a permittee or the federal action agency deviates from the measures outlined in a permit or project description, the federal action agency has the obligation to reinitiate consultation and comply with section 7(d).

This project should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this project.

This letter and its enclosures constitute a complete response by the U.S. Fish and Wildlife Service to your request for informal consultation. A complete record of this consultation is on file at the Washington Fish and Wildlife Office, in Lacey, Washington. If you have any questions about this letter or our joint responsibilities under the Endangered Species Act, please contact Mark Celedonia at (360) 534-9327 or Martha Jensen at (360) 753-9000, of this office.

Sincerely,

Martha L. Jensen

for Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

cc:
NMFS, Lacey, WA (T. Tynan)
WDFW, Olympia, WA (J. Scott)

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