



United States Department of the Interior

FISH AND WILDLIFE SERVICE



Bend Field Office
20310 Empire Avenue, Suite A-100
Bend, Oregon 97701
Phone: (541) 383-7146 FAX: (541) 383-7638

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October 15, 2018

Michael J. Lidgard
Manager, NPDES Permits Unit
U.S. Environmental Protection Agency
1200 Sixth Ave., Suite 900
Seattle, Washington 98101-3123

Subject: Informal Consultation on the Effects of issuance of the NPDES Permit for the Warm Springs National Fish Hatchery

Dear Mr. Lidgard:

This letter is in response to your August 22, 2018, request for our concurrence that issuance of a National Pollution Discharge Elimination (NPDES) permit "may affect, but is not likely to adversely affect" the bull trout (*Salvelinus confluentus*) and bull trout critical habitat. Your letter also included a Biological Evaluation (BE) (Gockel et al., 2018). The U.S. Environmental Protection Agency (EPA) proposes to issue a NPDES permit for discharges from the Warm Springs National Fish Hatchery (WSNFH), located on the Confederated Tribes of the Warm Springs Reservation in Oregon. The WSNFH is directly adjacent to the Warm Springs River, which supports a population of bull trout (*Salvelinus confluentus*) and has designated critical habitat for the bull trout. 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 EPA stated that the following five chemicals used at the WSNFH have the potential to be released to receiving waters where bull trout are present.

- Povidone-iodine
- Sodium chloride
- Chlorine
- Chloramine-T
- Formalin

We have concluded that the EPA has provided sufficient information to determine the effects of the proposed action, and to conclude whether it would adversely affect federally listed species and/or designated critical habitat. The duration of this consultation is equivalent to the duration of the EPA permit, which is 5 years from date of issuance. Consultation on these actions must be reinitiated when EPA proposes to reissue the permit.

Effects to Bull Trout

Hatchery operations require the use and discharge of water into the Warm Spring River adjacent to the facility. Hatchery water discharge may affect several water-quality parameters in the aquatic system. Waste products 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. Maintenance activities such as vacuuming and removal of accumulated sediment on the bottom of hatchery ponds and raceways may temporarily elevate the concentration of some contaminants in the hatchery water system. The possibility that bull trout will be exposed to concentrations of hatchery chemicals high enough to result in measurable effects depends in part on chemical use patterns and expected bull trout presence. Most chemicals used at hatcheries are used infrequently and/or intermittently, such that these chemicals are absent from the effluent at most times (Gockel et al., 2018).

Povidone-Iodine: Of the five chemicals evaluated by the EPA, povidone-iodine is the only one that is not used in water that flows through the hatchery (process water). Instead, povidone-iodine is commonly used to treat eggs after fertilization and, less commonly, to disinfect small equipment such as nets and boots. Egg treatment is infrequent (relatively few days per year) and uses small quantities of povidone-iodine. For gear treatment, containers of povidone-iodine solution are occasionally made available in certain areas of the hatchery and used as needed. This solution degrades over time as it sits out and gets used (Gockel et al., 2018). Any povidone-iodine solution that enters surface waters is expected to have very low concentrations of potentially harmful chemicals (e.g., elemental iodine), and to become rapidly diluted near the point of discharge. For these reasons, effects to bull trout from exposure to povidone-iodine are expected to be insignificant.

Sodium chloride: This is used to calm fish and reduce stress during handling or transport, and/or to treat external parasites. This latter purpose mimics a natural behavior of salmonids, whereby fish move between waters of differing salinities to rid themselves of external parasites. The hatchery uses concentrations of sodium chloride which are two to three times above naturally-occurring concentrations in freshwater, however the volumes used are quite small compared to the total volume of water discharged by hatcheries. Thus, we anticipate that effects to bull trout associated with exposure to sodium chloride will be insignificant.

For the remaining three chemicals, the EPA determined the Chronic No Effect Concentration (Chronic NOEC) to evaluate possible effects to bull trout. The NOEC is defined as the highest concentration of a material in a standard laboratory toxicity test that has no statistically significant effect on the test organisms as compared with a control group. In some cases empirical toxicity data had to undergo data transformations in order to obtain chronic NOECs.

The data transformations used to obtain chronic NOECs, their derivation, sources, and rationale for their use are described in the BE (Gockel et al., 2018).

As described in the BE (Gockel et al., 2018) the EPA used their Interspecies Correlation Estimation (ICE) model to calculate NOECs for bull trout; the most current version is called WebICE. The WebICE models are statistical regressions that permit estimations of LC50s (the concentration necessary to kill 50 percent of exposed organisms) to be made for a species or higher taxa having no measured acute toxicity information, based on information from another similar species for which five or more LC50s have been measured. The EPA developed WebICE models for the three chemicals listed below and all salmonid species evaluated in this BE, permitting quantitative evaluation of risks from hatchery chemicals. Both the LC50 and the lower 95% confidence interval of the modeled species LC50 is calculated by the WebICE model. The acute LC50 for each threatened and endangered species is then transformed into chronic NOEC values using either a chemical specific or a national default acute-chronic ratio.

The concentrations of chemicals in hatchery effluent depends on usage concentration, type of treatment (e.g., flow-through, static bath), and degradation and dilution prior to discharge. Calculation procedures and assumptions were intended to produce conservatively-high estimates of effluent chemical concentrations. For example, chemical degradation prior to discharge and dilution in effluent holding ponds were not factored into the estimates. Pulses of elevated chemical concentrations are likely to result from typical hatchery use patterns (e.g., when a treated raceway is flushed, or during a flow-through treatment), so the EPA considered both short-duration (acute, on the order of hours) and chronic (on the order of days) exposure scenarios. The EPA compared estimated end-of-pipe concentrations with chronic and acute WebICE-based NOECs for bull trout.

Chlorine: Chlorine is not currently used by the WSNFH, and the hatchery does not plan to use it in the future. However, EPA decided to evaluate chlorine in this BE because the hatchery could need to use it in the event of a future disease outbreak or some other unforeseen event. This use of chlorine could potentially result in its release to receiving waters where threatened and endangered species are present. Of the five salmonid species whose acute LC50s were estimated using WebICE model regressions, none of the model predicted chronic NOECs were lower than the freshwater chronic chlorine criterion of 11 µg/L.

The conclusion of the WebICE line of evidence for freshwater threatened and endangered salmonids is that the freshwater chronic chlorine criterion, which is the NPDES permit limit for chlorine discharges to fresh water, is not likely to adversely affect bull trout or other threatened and endangered salmonid species. The EPA noted that the chlorine criteria has already gone through consultation for bull trout in Idaho where the Service concurred with a “not likely to adversely affect determination.”

Chloramine-T: Estimated end-of-pipe concentrations were less than the estimated NOECs, which suggests that estimated effluent chemical concentrations are at or near levels that would not be expected to injure bull trout (Gockel et al., 2018). Actual discharge concentrations are likely lower when factoring in chemical degradation and holding pond dilution prior to discharge. Additional dilution will occur at and near the point of discharge as the effluent mixes with the receiving waterbody. The Warm Springs River where bull trout could be directly exposed to hatchery effluent has flow rates which would dilute hatchery chemicals near the point of discharge. The fact that actual exposure concentrations are likely to be well below the

estimated NOECs suggests a very low risk of injury. Since chloramine-T is used intermittently and sporadically it is infrequently present in the effluent. Thus, it is unlikely that bull trout would be exposed to concentrations of chloramine-T for durations or at concentrations that would cause a measureable effect to their physiology or behavior.

Formalin: In the hatchery formalin is administered to salmon and trout as a bath treatment. If released into water, the formaldehyde in the formalin is not expected to adsorb to suspended solids and sediment. However, formaldehyde readily biodegrades under both aerobic and anaerobic conditions in the environment. In a biodegradation test using water from a stagnant lake, degradation was complete in 30 and 40 hours under aerobic and anaerobic conditions, respectively. Formaldehyde is not expected to bioaccumulate in aquatic organisms, as it is metabolized and transformed by them through various metabolic pathways.

The EPA used a model developed by the USGS to calculate the end-of-pipe Environmental Introduction Concentration (EIC) for formalin and formaldehyde. EPA ecological risk assessment guidance specifies the use of the 95th percentile upper confidence limit (UCL) of the mean to generate exposure point concentrations. Therefore, in addition to reporting the summary statistics generated by the USGS survey data and model, EPA calculated the Expected Environmental Concentrations (EEC) from the 95% UCL for use as exposure point concentrations for each dosing regimen for formalin and formaldehyde. These represent the range of dose concentrations over time and as anticipated degradation occurs.

After fish are treated with formalin in the hatchery they are routinely evaluated for secondary effects on fish physiology and metabolism which indicate chemotherapeutic stress. EPA has reviewed these evaluations and identified concentrations of formalin that are associated with stress responses. Because formalin is administered for short periods of time, the evaluations of secondary toxicity have also been designed for short (30 minutes to 1 hour) exposures. The concentrations resulting in these sublethal effects range are orders of magnitude greater than the EICs for formalin and formaldehyde. Thus, the EICs predicted from the USGS model are not expected to result in sublethal effects to listed salmonids and other fish. Lethal effects to listed salmonids are also not likely to occur, based on the chronic NOEC which was calculated using the lowest LC50 from the WebICE model.

Additional factors that minimize risk to bull trout include the following:

- Hatchery chemicals are not in continuous use. Instead they are used intermittently and sporadically, and thus are infrequently present in the effluent.
- Hatchery chemicals degrade to harmless byproducts in the environment and do not bioaccumulate. For these reasons, the presence of hatchery chemicals and their degradation byproducts in receiving waterbodies and their potential to move through the food web is limited.
- There are no other known discharges of these chemicals in the vicinity of the WSNFH. Therefore, the discharges are not expected to contribute to existing chemical loads in the receiving waterbodies.

For the reasons described above, we do not expect bull trout to be exposed to potentially harmful elements of hatchery effluent for durations or at concentrations that could result in injury or a significant impairment of their normal behavior. Thus, we conclude that effects to bull trout

growth, reproduction, and survival from discharge of hatchery effluent and chemicals are insignificant.

Effects to Bull Trout Critical Habitat

The Service's 2010 final revised rule designating bull trout critical habitat identifies nine Primary Constituent Elements (PCE) 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 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.

As described above, discharge of solids and chemicals from hatchery facilities will be intermittent and at very low levels. Effects to water quality associated with effluent discharges will be limited to small, localized areas in the immediate vicinity of outfall pipes. These effects 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.

Invertebrates and fish in the immediate vicinity of discharge pipes may be affected by hatchery effluent. However, these areas are small and localized, and will not affect the overall abundance of forage available to bull trout. Therefore, effects to this PCE are considered insignificant.

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

For the reasons described in the Effects to Bull Trout section, the proposed action will have an insignificant effect on the PCEs.

Conclusion

Based on our review of the BE regarding the possible effects of the proposed action, the Service concurs with the EPA's "may affect, not likely to adversely affect" determination regarding the proposed action. We also agree that the proposed action will not adversely modify designated critical habitat.

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 action 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 Service to your request for consultation. A complete record of this consultation is on file at the Oregon Fish and Wildlife Office, in Bend, Oregon. If you have any questions about this letter or our joint responsibilities under the ESA, please contact Peter Lickwar (541) 383-7146 at this office.

Sincerely,



Bridget Moran
Bend Office Supervisor

Literature Cited

Gockel, C., B. Shephard, and N. Villa. 2018. Biological Evaluation for Endangered Species Act Section 7 Consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service: NPDES Permit OR0054917 Warm Springs National Fish Hatchery. United States Environmental Protection Agency, Seattle, WA.