4(d) Rule Limit 6

Proposed Evaluation and Pending Determination

Title of RMP:	A Hatchery and Genetic Management Plan for a Dungeness River Basin Summer Chum Salmon Hatchery Program
RMP Submitted by:	Jamestown S'Klallam Tribe Washington Department of Fish and Wildlife
ESU/DPS:	Hood Canal – Strait of Juan de Fuca Summer Chum ESU Puget Sound Chinook Salmon ESU Puget Sound Steelhead DPS
4(d) Rule Limit:	50 CFR 223.203(b)(6) (Limit 6)
NMFS Tracking Number:	WCRO-2025-02338
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1 EVALUATION

NOAA's National Marine Fisheries Service (NMFS) issued a final Endangered Species Act (ESA) 4(d) rule adopting regulations necessary and advisable to conserve Hood Canal-Strait of Juan de Fuca summer chum salmon (50 CFR 223.203); 64 FR 14508, March 25, 1999). These regulations were subsequently applied to the Puget Sound Chinook salmon (70 FR 37160, June 28, 2005) and then the Puget Sound Steelhead Distinct Population Segment (DPS) in a separate final rule (73 FR 55451, June 25, 2008). Under Limit 6 of the Rule, ESA section 9 take prohibitions for these listed salmonid species do not apply to hatchery activities that are undertaken in compliance with a resource management plan (RMP) developed jointly by the Tribes and the State of Washington that is consistent with the 4(d) rule criteria.

Section 9 of the ESA prohibits the take of endangered species, and pursuant to §4 NMFS has extended that prohibition to threatened salmon and steelhead. Under the Limit 6 in the 4(d) rule (50 CFR 223.203(b)(6)), which addresses joint state-tribal plans, those prohibitions are rescinded for hatchery activities described in an RMP, provided that:

- The Secretary of Commerce has determined pursuant to 50 CFR 223.204(b) [the Tribal 4(d) rule]1 and the government-to-government processes therein that implementing and enforcing the RMP will not appreciably reduce the likelihood of survival and recovery of listed salmon and trout;
- The joint plans applying for 4(d) limit 6 review will be implemented and enforced within the parameters set forth in *U.S. v. Oregon* or *U.S. v. Washington*; and
- The Secretary of Commerce has taken comment on how any hatchery and genetics management plan (HGMP) addresses the 4(d) rule limit 5 criteria (50 CFR 223.203(b)(5)).

The Jamestown S'Klallam Tribe and Washington Department of Fish and Wildlife (WDFW), as co-managers of the fisheries resource under *U.S. v.Washington* (1974), have provided NMFS with a HGMP proposed for implementation of a summer chum salmon hatchery program in the Dungeness River watershed (

Table 1; Figure 1). The applicants have provided the HGMP for review and determination by NMFS pursuant to limit 6 of the ESA 4(d) rule. The HGMP serves as an RMP for the purpose of limit 6 consideration; for this evaluation, descriptions of the proposed activities will focus on the descriptions given in the individual HGMP.

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1 The text of the 4(d) rule references 50 CFR §223.209 in this location; that subsection was redesignated and currently appears at 50 CFR §223.204. See 70 FR 37160, 37203 (June 28, 2005).

The HGMP was prepared consistent with the Puget Sound Salmon Management Plan (1985), and the Federal court orders under *U.S. v. Washington* (1974) that govern fisheries harvest management and hatchery salmon production (WDFW 2023).

When completed, NMFS' Biological Opinion evaluating the effects of the programs considered in this determination for consistency with the Endangered Species Act (ESA) and the Environmental Assessment associated with this determination that NMFS prepared consistent with the National Environmental Policy Act (NEPA) will be publicly available online at the NOAA Institutional Repository. Effects from the hatchery programs considered in this determination to listed species including Southern Resident Killer Whales (SRKW) were considered previously in a Biological Opinion (NMFS 2020) publicly available online in our repository at https://repository.library.noaa.gov/view/noaa/28322.

The U.S. Fish and Wildlife Service (USFWS) considered effects of our determination by evaluating the twelve hatchery programs' effects to ESA-listed species under their regulatory purview, including bull trout, in a separate Biological Opinion (USFWS 2025).

From a salmon recovery perspective, the Dungeness summer chum salmon hatchery program has been designed to support re-introduction of summer chum from the Strait of Juan de Fuca population into the Dungeness River. The Dungeness River subpopulation has been extirpated and increased abundance, expansion of spatial distribution, and increased productivity of summer chum in the Dungeness River will support recovery of the ESU.

Table 1. Proposed summer chum salmon hatchery program for the Dungeness River basin. ESA = Endangered Species Act; WDFW = Washington Department of Fish and Wildlife.

Hatchery and Genetics Management Plan (HGMP)	Program Operator	ESA Listed
Dungeness River Summer Chum Supplementation Hatchery Program	WDFW	Yes

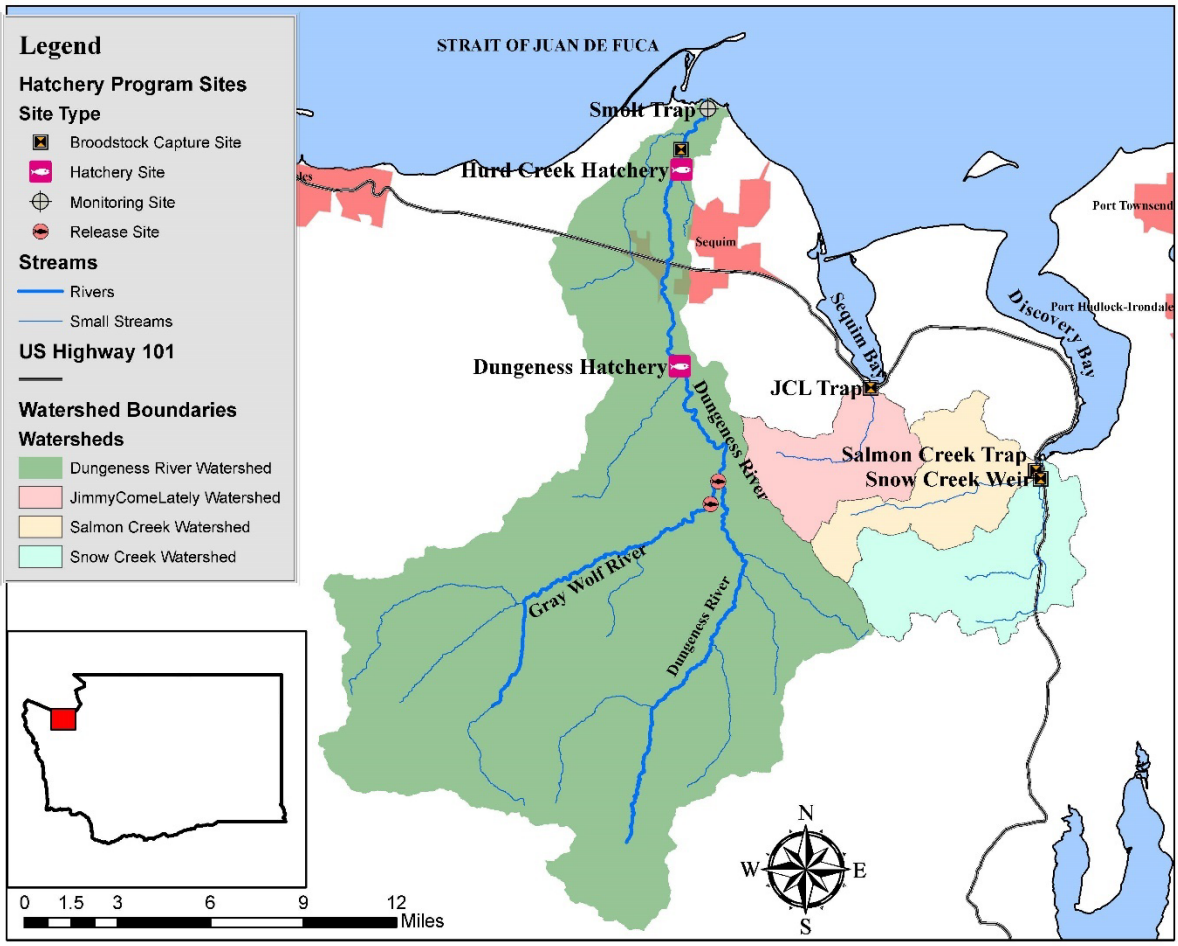

Figure 1. The Dungeness River watershed, adjacent marine areas, and the facilities associated with the Dungeness salmon hatcheries as well as summer chum broodstock collection.

1.1 5(i)(A) The HGMP has clearly stated goals, performance objectives, and performance indicators that indicate the purpose of the program, its intended results, and measurements of its performance in meeting those results.

The HGMP has clearly stated its goal, performance objectives, and methods for measuring the progress toward achieving those objectives. The general program goals described in Section 1.7 of the HGMP for propagating hatchery fish are to contribute to:

- Mitigating for lost natural-origin fish production
- Recovering ESA-listed Hood Canal-Strait of Juan de Fuca summer chum salmon ESU
- Fulfilling Tribal treaty rights affirmed in *U.S. v. Washington* (1974)
- Providing for Tribal ceremonial and subsistence fishing

Performance objectives and performance indicators that would be used to gauge compliance with each objective are described in Section 1.10 of each HGMP. Evaluation and monitoring to ensure standards and indicators are met are further described in Section 1.8 of this document and are summarized in Table 2.

Monitoring of HGMP implementation would generally be designed to determine:

1. Program consistency with proposed hatchery actions and intended results (e.g., juvenile fish release and adult return levels);
2. Measurement of the program's success or failure in attaining results; and
3. Effects of the program on listed natural-origin fish populations in Puget Sound freshwater and marine waters where these fish may migrate or return.

Table 2. Summary of HGMP program performance standards and indicators.

Standard	Indicator
Produce fish for recovery purposes	• Estimate and assess release and escapement goals versus performance • Marking to allow identification of program fish
Reintroduction and Supplementation of natural population (integrated programs only)	• Increasing proportion of natural-origin fish • Increasing natural smolt levels
Proper broodstock collection and management	• Collected randomly throughout the run • Weir/trap checked regularly • Proportion of natural-origin fish per HGMP • Designated mating scheme, sex ratio • Adheres to spawning guidelines • Escapement rates
Meet hatchery juvenile production goal	• Egg to fry or smolt survival is as expected • Release target
Minimize interactions of releases with natural-origin fish	• Juveniles released at sea-water ready life stages and size • Size and time of release is appropriate for a well-integrated program • Monitoring of fish after release
Life history characteristics of the natural population do not change due to artificial propagation	• Stable life history patterns of natural fish • Age and size data for natural population
Natural population genetic variation does not change due to artificial propagation	• Proportion of naturally spawning hatchery fish • Genetic assessment
Limit pathogen amplification and transmission	• Follows co-manager fish health policy (NWIFC and WDFW 2006)

1.2 5(i)(B) The HGMP utilizes the concepts of viable and critical salmonid population thresholds, consistent with the concepts contained in the technical document entitled "Viable Salmonid Populations."

HGMPs proposed for consideration under the 4(d) rule must use the concepts of viable and critical thresholds as defined in the NMFS Viable Salmonid Population (VSP) document (McElhany et al. 2000). Application of these VSP concepts is needed to adequately assess and limit the take of listed salmonids for the protection of the species. Section 2.2.2 of each HGMP describes the status of the listed summer chum salmon, Chinook salmon, and steelhead populations relative to "critical" and "viable" population thresholds within the Dungeness watershed as well as the Snow, Salmon, and Jimmycomelately Creek populations and references NMFS reviews' of species status.

The Hood Canal-Strait of Juan de Fuca Summer chum salmon ESU includes all naturally spawning populations of summer-run chum salmon in Hood Canal tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington. Hood Canal-Strait of Juan de Fuca summer-run chum are the southernmost occurrence of the summer-run life history for the species. The ESU appears to be uniquely adapted to the local habitat conditions, allowing this life-history to persist in what otherwise would be deemed an inhospitable environment. The Puget Sound Technical Recovery Team identified two independent populations for Hood Canal-Strait of Juan de Fuca summer chum based on genetic variation, one which includes the spawning aggregations from rivers and creeks draining into the Strait of Juan de Fuca, and one which includes spawning aggregations within Hood Canal proper (Sands et al. 2009). The Strait of Juan de Fuca population spawns in rivers and streams entering the eastern Strait of Juan de Fuca and Admiralty Inlet while the Hood Canal population includes all spawning aggregations within the Hood Canal watershed. Genetic analyses showed that differences among spawning aggregations followed a pattern of isolation by distance, where the amount of exchange between spawning aggregations was greatest among streams that were geographically close with independence among spawning aggregations increasing with geographical distance. To maintain diversity and spatial structure to support population viability, the Hood Canal and Strait of Juan de Fuca populations should have persistent spawning aggregations in each of the major ecological diversity groups delineated within their boundaries. In addition, spawning aggregations need to be distributed across the historical range of the population to enhance diversity and increase the chances that each population will be resilient to future environmental and anthropogenic changes. Since the Hood Canal-Strait of Juan de Fuca Summer Chum Salmon ESU has only two independent populations, both the Strait of Juan de Fuca population and the Hood Canal population would need to be viable to have a viable ESU at low risk of extinction (Sands et al. 2009). Sixteen historical demographically independent populations of Hood Canal-Strait of Juan de Fuca summer-run chum have been identified for this ESU: eight extant populations (the Union River, Lilliwaup Creek, Hamma Hamma River, Duckabush River, Dosewallips River, Big/Little Quilcene River, Snow and Salmon creeks, Jimmycomelately Creek populations), and eight

extirpated or possibly extirpated populations (the Dungeness River, Big Beef Creek, Anderson Creek, Dewatto Creek, Tahuya River, Skokomish River, Finch Creek, and Chimacum Creek populations) (WDFW and PNPTT 2000).

Summer chum salmon continue to persist in the Dungeness River with metapopulation dynamics likely being important in maintaining the low numbers of observed spawners. The Dungeness summer chum subpopulation is essential for recovery of the Strait of Juan de Fuca population and the Hood Canal-Strait of Juan de Fuca summer chum ESU (Sands et al. 2009). Reintroducing summer chum to historically occupied areas including the Dungeness River will recover the population's spatial structure and diversity which will contribute to recovery (NMFS 2007; Ford 2022). Extensive habitat protection and restoration work has been completed and is ongoing in the Dungeness River watershed to support increased salmon populations including summer chum (Gately 2020; Brooks 2021). Summer chum are particularly vulnerable to the effects of future environmental conditions and establishing a robust spawning aggregation in the newly restored Dungeness River would support the diversity of the ESU.

Chinook salmon

The Puget Sound Chinook salmon ESU is listed as threatened, since 1999 (64 FR 14308), and includes naturally spawned Chinook salmon from rivers flowing into Puget Sound, encompassing Hood Canal, South Sound, North Sound, and the Strait of Georgia. Most Puget Sound Chinook salmon populations are well below escapement levels and productivity goals required for recovery. Most populations are consistently well below the productivity goals identified in the recovery plan. Although long-term trends (1990 forward) vary for individual populations across the Puget Sound Chinook ESU, currently 20 populations exhibit a stable or increasing long-term trend in total natural escapement and thirteen of 22 populations show a growth rate in the 18-year geometric mean natural-origin spawner escapement that is greater than or equal to 1.00. Even given some of the incremental increases in natural-origin spawner abundances in the most recent five-year period, the long-term trends in both abundance and productivity, in most Puget Sound populations, are well below the levels necessary for recovery.

The current abundance of Dungeness Chinook salmon is substantially reduced from historical levels (Entrix 2005). Between 1999 and 2018, the estimated average total annual naturally spawning Chinook salmon escapement was 411, compared to the recovery goal at high productivity of 1,200 natural spawners (Ford 2022). Hatchery-origin Chinook salmon associated with the Dungeness conservation hatchery program make up a sizeable fraction of the annual naturally spawning adult abundance, averaging 72% for the basin. Total naturally spawning fish escapements have fluctuated with changes in the conservation hatchery program with the highest escapements reflecting years when adult progeny from the hatchery program returned to spawn. Total annual naturally spawning Chinook salmon escapement for the most recent 5 years has averaged 779 ranging from 523 to 930, and with 73.5 percent and 26.5 percent on average being hatchery-origin and natural-origin, respectively. The most recent NMFS status review for the

ESU found that productivity trends for the Dungeness Chinook salmon population, as measured by recruit per spawner and spawner to spawner rates, are low and decreasing with natural spawner-to-spawner productivity falling below replacement levels in all years since the mid-1980s (Ford 2022). Estimates for juvenile Chinook salmon outmigrant production for brood year 2004-2019 ranged from a high of 164,814 out-migrating fish in 2013 to a low of 3,870 outmigrants in 2015. Estimated egg to migrant survival has ranged from 0.99 percent to 15.32 percent and averaged 4.96 percent for return years 2004 through 2019 (WDFW 2020).

Steelhead

The Puget Sound Chinook steelhead DPS is listed as threatened, since 2007 (72 FR 26722), and includes naturally spawned steelhead originating below natural and manmade impassable barriers from rivers flowing into Puget Sound from the Elwha River (inclusive) eastward, including rivers in Hood Canal, South Sound, North Sound and the Strait of Georgia. Puget Sound steelhead abundance estimates are available for seven of the 11 winter-run DIPs and one of the five summer-run DIPs in the Northern Cascades MPG, five of the eight winter-run DIPs in the Central and South Puget Sound MPG, and seven of the eight winter-run DIPs in the Hood Canal and Strait of Juan de Fuca MPG. Little or no data is available on summer run populations to evaluate extinction risk or abundance trends. Due to their small population size and the complexity of monitoring fish in headwater holding areas, summer steelhead have not been broadly monitored. Data continue to only be available for one summer-run DIP, the Tolt River steelhead population in the Northern Cascades MPG for the 2015-2019-time frame. Long-term abundance of steelhead in populations for which data are currently available has shown a generally declining trend across much of the DPS over the full period of the abundance data available for each DIP; however, the latest biological viability assessment update notes that in the nearer term, there has been a relative improvement in abundance and productivity(Ford 2022). Since 2015, 14 of the 22 populations indicate small to substantive increases in abundance, though most steelhead populations remain small. From 2014 to 2019, eight of the 22 steelhead populations had fewer than 250 natural spawners annually, and 12 of the 22 steelhead populations had 500 or fewer natural spawners.

The Puget Sound steelhead technical recovery team (PSSTRT) delineated one extant steelhead population that is native to the Dungeness River watershed and part of the listed Puget Sound steelhead DPS: Dungeness River Winter-Run (Myers et al. 2015). A summer-run component of the steelhead return to the Dungeness River is thought to have existed historically in the upper accessible reaches of the mainstem Dungeness River and Gray Wolf River (Haring 1999), but it is uncertain whether this run still persists in the watershed although WDFW lists the summer-run race in the Dungeness River as extant (Scott and Gill 2008). An estimate of the intrinsic potential based on spawner capacity indicates that the Dungeness River watershed could support the production of 2,465 natural-origin steelhead, or 24,650 smolts (Myers et al. 2015). Smolt production from 2005 through 2020 has ranged from 4,354 (2016) to 19,600 (2011), averaging 10,394 (WDFW 2020). The most recent year's (2020) smolt production of 12,281 is

approximately 50 percent of the intrinsic potential estimated by Myers et al. (2015). The critical threshold for winter-run steelhead natural spawners identified by the co-managers' is 125 fish and the viable threshold, reflecting a level of population abundance associated with a very high probability of persistence, or conversely, a very low risk of extinction, for a period of 100 years, is between 500 and 750 natural-origin spawners (PSIT and WDFW 2010). Recent abundance of adult steelhead spawning in the Dungeness River over the most recent five-year period (2015-2019) averaged 408 adult steelhead annually. In contrast, the recovery target is 1,200 spawners at high productivity and 4,100 spawners at low productivity.

Summary

NMFS has not yet made a determination about the effects of this hatchery program. While a review of the most current information indicates the status of Puget Sound Chinook salmon and steelhead remain low, our preliminary opinion is that the summer chum salmon released from this program will not interact with Chinook salmon or steelhead populations at levels that will lead to ecological effects reducing VSP parameters for Puget Sound Chinook salmon or steelhead. The effects of this program will be further analyzed in the forthcoming Biological Opinion.

1.3 5(i)(C) Taking into account health, abundances, and trends in the donor population, broodstock collection programs reflect appropriate priorities.

Under the 4(d) rule criterion, as described in the 4(d) rule, listed salmonids may be intentionally taken for broodstock only if:

1. The donor population is currently at or above the viable threshold and the collection will not impair its function, or
2. The donor population is not currently viable but the sole objective is to enhance the propagation or survival of the listed ESU, or
3. The donor population is shown with a high degree of confidence to be above the critical threshold although not yet functioning at viable levels, and the collection will not appreciably slow attainment of viable status for that population.

As described in Section 6 of the HGMP, ESA-listed summer chum salmon are collected for broodstock as part of the Dungeness summer chum salmon supplementation hatchery program. Natural-origin adult summer chum salmon returns to Jimmycomelately, Salmon, and possibly Snow Creeks will be collected as broodstock for the new hatchery program operated to increase naturally spawning adults to increase abundance and productivity in the Dungeness River. Using natural-origin broodstock will ensure the hatchery component of the population is in genetic equilibrium with the natural component to promote recovery. Up to 274 adult summer chum salmon will be collected and spawned to support the releases in the Dungeness watershed. The co-managers will monitor escapement of adult natural-origin summer chum salmon in the creeks to ensure that no more than 20% of the returning adults are removed from any of the donor

populations consistent with the Summer Chum Salmon Conservation Initiative (SCSCI; WDFW and PNPTT 2000). The summer chum salmon populations returning to Jimmycomelately and Salmon Creeks are robust as the result of successful supplementation programs and removing the proposed number of adult summer chum salmon for broodstock will result in removal of less than 20% of the spawners (WDFW and PNPTT 2000; Downen 2025).

1.4 5(i)(D) The HGMP includes protocols to address fish health, broodstock collection and spawning, rearing and release of juveniles, disposition of hatchery adults, and catastrophic risk management.

The proposed HGMP includes protocols for fish health, broodstock collection, broodstock spawning, rearing and release of juveniles, disposition of hatchery adults, and catastrophic risk management.

Fish Health (HGMP Sections 7, 9, and 10)

The hatchery program would be operated in compliance with the co-manager fish health policies (NWIFC and WDFW 2006). The policies are designed to limit the spread of fish pathogens between and within watersheds by regulating the transfers of eggs and fish. The policies also outline standard fish health diagnosis, maintenance, and hatchery sanitation protocols to reduce the risk of pathogen amplification and transmission within the hatchery and to fish in the natural environment during broodstock collection and mating as well as fish incubation, rearing, and release. Fish health specialists and pathologists from WDFW or Northwest Indian Fisheries Commission (NWIFC) would provide fish health management support and diagnostic fish health services.

Broodstock Collection and Spawning (HGMP Sections 6, 7, and 8)

Only natural-origin summer chum salmon will be used as broodstock for the Dungeness summer chum salmon supplementation hatchery program, consistent with the purpose of the integrated recovery program.

The protocols for broodstock implement spawning actions consistent with published guidelines (HSRG 2004). Matrix spawning (e.g., eggs from a single female are fertilized by multiple males and a single male fertilizes multiple females) conserves genetic diversity by limiting the risk of use of a sterile adult during spawning (Busack and Knudsen 2007). Broodstock collection and spawning details are summarized in Table 3.

Table 3. Annual number of broodstock collected, collection method, and spawning approach.

Program	Collection Location	Collection Duration	Collection Method	Adults Collected	Broodstock Needed	Mating Protocol	Natural Origin Broodstock
Dungeness Summer Chum Salmon Hatchery Supplementation Program	Jimmycomelately and Salmon Creeks; possibly Snow Creek	August-October	Weir	274	274	4 X 4 Spawning Matrix	100%

Rearing and Release of Juveniles (HGMP Sections 9 and 10)

Fish from the programs would be released as fry to ensure rapid emigration downstream through watershed areas where interactions with rearing listed fish may occur. Summer chum fry may be trucked to the lower Dungeness River below the smolt trap for release. Release numbers, life stage, location, percentage marked, and dates for all hatchery programs are detailed in Table 4.

Disposition of Hatchery Adults (HGMP Sections 7.5 and 7.8)

Adult summer chum salmon will not be collected in excess of annual broodstock needs. Spawned carcasses may be sold to a contracted fish buyer or placed in the watershed for marine-derived nutrient enhancement purposes.

Catastrophic Risk Management (HGMP Section 5.8)

All facilities adhere to the applicants' fish health policies (NWIFC and WDFW 2006). Facilities have a hatchery employee on standby at the hatchery at all times to monitor hatchery operations and respond to any unexpected events. The facilities are equipped with low water alarms and a back-up generator in case of power loss.

Table 4. Proposed release goals and protocols for the Dungeness summer chum salmon hatchery program.

Program	Release Duration	Release Location	Current Release Goal	Size in Fish per Pound (fpp) and Life Stage at Release	Mark
Dungeness Summer Chum Salmon Hatchery Supplementation Program	May-June	On-station from Hurd Creek hatchery; off-station throughout the Dungeness watershed	300,000	Fed Fry 800 fpp	100% Otolith marked

1.5 5(i)(E) The HGMP evaluates, minimizes, and accounts for the propagation programs' genetic and ecological effects on natural populations, including disease transfer, competition, predation, and genetic introgression caused by straying of hatchery fish.

The Dungeness summer chum salmon supplementation hatchery program HGMP provides evaluations of potential genetic and ecological effects on listed salmon and steelhead in Section 2 and risk minimization measures in Sections 6-10.

Genetic effects

Generally speaking, NMFS view is that artificial fish production may result in a loss of within-population genetic diversity (the reduction in quantity, variety, and combinations of alleles in a population), outbreeding depression (loss in fitness caused by changes in allele frequency or the introduction of new alleles) and/or hatchery-influenced selection (Busack and Currens 1995). There are no genetic effects to Chinook salmon or steelhead since the program considered does not propagate Chinook salmon or steelhead. Therefore, our discussion of genetic effects focuses on the propagation of summer chum salmon. Potential genetic effects are discussed in Sections 7 and 9 of the HGMP.

The Dungeness summer chum salmon hatchery program will be operated to recover the extirpated population Dungeness River which will benefit the Hood Canal-Strait of Juan de Fuca summer chum ESU by increasing diversity and viability. Because the hatchery program propagating ESA-listed summer chum salmon will be operated as an integrated program, some interbreeding between hatchery- and natural-origin fish is an objective. The summer chum salmon hatchery program HGMP accounts for and minimizes genetic risks through implementation of the following measures:

- Broodstock are randomly collected throughout the adult return to ensure full representation of run timing, age class, and sex ratio
- Factorial mating ensures that all spawners contribute to the production of progeny to retain genetic diversity
- Natural-origin fish only are collected for broodstock to limit divergence from the native Hood Canal-Strait of Juan de Fuca summer chum salmon populations
- Consistent with the SCSCI, the supplementation program will operate for 12 years to limit genetic effects related to hatchery rearing as well as limit effects to the donor populations
- All fish are marked to differentiate them from other summer chum salmon stocks, assess escapement, and estimate proportions of hatchery- and natural-origin spawners in the Dungeness River basin

Ecological effects

The primary ecological risks to natural-origin salmon and steelhead populations posed by salmon and steelhead hatchery programs are identified in the HGMPs as competition for food resources and space, and predation (NMFS 2012). Pathogen transfer and amplification are also risk factors. As noted in the HGMP and earlier in this document, all hatchery actions would be implemented in accordance with the co-manager's Disease Control Policy (NWIFC and WDFW 2006) to account for and minimize the risks of pathogen transmission and amplification.

The HGMP has incorporated some of the following measures to minimize competition and predation risks associated with program implementation:

- Summer chum salmon are released as seawater-ready fry to foster rapid emigration seaward, maximizing clearance from freshwater and estuarine areas where natural fish would be most concentrated and most vulnerable to ecological interactions. Fry may be trucked to the lower Dungeness River which would further reduce interactions with natural-origin salmon and steelhead
- Trapping data indicates juvenile chum salmon fry migrate seaward rapidly minimizing the potential for ecological effects in freshwater
- Chum salmon fry are too small at the time of their release to prey on or compete for preferred prey of any co-occurring natural-origin juvenile Chinook salmon or steelhead

1.6 5(i)(F) The HGMP describes interrelationships and interdependencies with fisheries management.

The HGMPs describe the relationship of the proposed actions with fisheries management in Section 3.

The HGMP indicates that all co-managed hatchery programs in the Puget Sound region would operate consistent with the *U.S. v. Washington* (1974) fisheries management framework. This legal framework sets forth required measures for coordinating implementation of State and Tribal hatchery programs, defining artificial production objectives, and maintaining treaty-fishing rights through the court-ordered Puget Sound Salmon Management Plan (1985). This fisheries resource co-management process requires that both the State of Washington and the Puget Sound Tribes develop salmon and steelhead hatchery program goals and objectives, and reach agreement on the function, purpose, and fish production strategies for all Puget Sound hatchery programs.

The goal of the Dungeness summer chum salmon supplementation hatchery program is to increase the abundance and productivity of summer chum in the Dungeness watershed where the summer chum population was extirpated. Summer chum salmon are not targeted by fisheries. State recreational and tribal fisheries for hatchery-origin species may incidentally affect summer chum salmon. However, these fisheries are not considered interrelated with or interdependent on

these programs because these programs do not produce fish for the fisheries.

1.7 5(i)(G) Adequate artificial propagation facilities exist to properly rear progeny of naturally spawned broodstock, that maintain population health, diversity, and to minimize hatchery-influenced selection and domestication.

The facilities that propagate ESA-listed salmon take measures to reduce the potential for catastrophic loss of rearing populations in the event of water or power failure at the facility. Dungeness and Hurd Creek Hatcheries are staffed full-time with employees residing on-station allowing for quick response in an emergency. A low flow alarm system and back-up generator also allow for appropriate response to water or power failures to safeguard rearing fish. Water required for rearing at the remote rearing sites in the Dungeness Basin will depend on what is available once sites are chosen. Ideally, gravity flow water will be supplied from a small stream or directly from the river through a screen that is compliant with current NMFS criteria. If gravity water is not available water may be supplied via electric pumps powered by a generator. Incubating and rearing eggs and fry will therefore not be affected by power failures.

Facilities that rear over 20,000 pounds of fish operate under applicable National Pollutant Discharge Elimination System (NPDES) general permits, which provide for monitoring of temperature, chlorine, settleable, and suspended solids in facility effluent. As mentioned previously, the HGMP describes how fish health is maintained throughout rearing by adhering to fish health policies and using pathogen-free water sources when possible (NWIFC and WDFW 2006). Minimization of catastrophic loss and genetic risks associated with these programs were addressed in Sections 1.4 and 1.5, respectively, of this document.

1.8 5(i)(H) Adequate monitoring and evaluation exist to detect and evaluate the success of the hatchery program and any risks potentially impairing the recovery of the listed ESU.

The proposed HGMP includes implementation of adequate monitoring and evaluation actions to evaluate the performance of the hatchery program in meeting program objectives. These actions are summarized in Section 1.10, and are further described in Section 11 of the HGMP. Some of these activities may be covered using other ESA pathways (e.g., Section 10 research permits), but the information obtained may be relevant to our evaluation of the hatchery program. Monitoring and evaluation actions implemented include:

- Spawning ground/redd surveys to determine the proportion of naturally spawning hatchery-origin fish
- Trapping of outmigrating juveniles to determine post-release emigration timing, emigration rate, and hatchery fish predation levels on natural fish

- Estimating of smolt-to-adult survival rates, harvest of hatchery fish, and escapement of hatchery Dungeness summer chum salmon to natural spawning areas using mark recovery programs
- Collection of abundance, timing, age class, sex ratio, and fish health condition data for broodstock to assess run traits of the target populations
- Monitoring of water withdrawal and effluent to ensure compliance with permitted levels
- Monitoring of broodstock collection, egg take, releases, hatchery and natural fish escapements, and fish survival rates to assess program performance
- Fish health monitoring and reporting in compliance with fish health policies.

1.9 5(i)(I) The HGMP provides for evaluating monitoring data and making any revisions of assumptions, management strategies, or objectives that data show are needed.

Under the HGMP in Section 1.10, data collected relating to hatchery program performance and effects would be evaluated by the applicants to determine whether performance standards are being met. Annual reports for the programs assembled by the applicants which include their evaluation of the data analyzing the performance of the hatchery programs relative to their goals would be jointly reviewed by NMFS to document program results, and to determine if adjustments to the programs' assumptions and management strategies are warranted. Any changes would be incorporated into Future Brood Documents, Annual Operating Plan documents, and/or the HGMP as necessary. This program is co-managed by WDFW and Puget Sound tribes consistent with *U.S. v. Washington* (1974) and comanagers will submit annual reports and operating plans to NMFS. The tribes and WDFW employ enforcement officers throughout the area, who are responsible for on the ground enforcement to prevent ESA violations.

1.10 5(i)(J) NMFS provides written concurrence [with] the HGMP, which specifies the implementation and reporting requirements.

NMFS will make a determination regarding the adequacy of the Dungeness summer chum salmon supplementation hatchery program HGMP. If the determination is made that implementing and enforcing the plan will not appreciably reduce the likelihood of survival and recovery of the ESA-listed species, and that the plans address all the criteria specified in limit 6 of the 4(d) rule, NMFS will so notify the applicants in writing, and will specify any necessary implementation and reporting requirements.

1.11 5(i)(K) The HGMP is consistent with plans and conditions set within any Federal court proceeding with continuing jurisdiction over tribal harvest allocations.

The Dungeness summer chum salmon HGMP was developed by the applicants pursuant to the *U.S. v. Washington* (1974) fisheries and hatchery management framework. The HGMP is one component of an effort to preserve and recover ESA-listed Hood Canal-Strait of Juan de Fuca

summer chum salmon. The ESU recovery plan for summer chum salmon has hatchery, harvest, and habitat components, and includes monitoring, research, and restoration recommendations to complement artificial production (HCCC (Hood Canal Coordinating Council) 2005). The hatchery actions described in the HGMP are included within, and consistent with, this recovery plan. The SCSCI also provides recommendations for the operation of the proposed summer chum salmon hatchery program (WDFW and PNPTT 2000).

2 PENDING DETERMINATION

As required by limit 6 of the 4(d) rule, the Secretary is seeking comment from the public on the pending determination as to whether or not the plans evaluated here would appreciably reduce the likelihood of survival and recovery of the listed salmon and steelhead. In addition, comment is sought on whether the plans meet the requirements of limit 6 of the 4(d) rule.

NMFS has reviewed the plan and evaluated it against the requirements of the 4(d) rule. Based on this review and evaluation, NMFS' pending determination, subject to information provided during public comment, is that activities implemented as described would not appreciably reduce the likelihood of survival and recovery of ESA-listed species. This pending determination does not prejudge the outcome of any additional environmental reviews that may be scheduled to be completed prior to a final determination. As required in (6)(iv) of section 223.203 of the 4(d) rule for salmon and steelhead, the Secretary will publish notice of his determination together with a discussion of the biological analysis underlying that determination.

3 REEVALUATION CRITERIA

NMFS will reevaluate its final determination regarding these HGMPs if: (1) the actions described by the plans are modified in a way that causes an effect on the listed species that was not previously considered in NMFS' evaluation; (2) new information or monitoring reveals effects that may affect listed species in a way not previously considered; or (3) a new species is listed or critical habitat is designated that may affect NMFS' evaluation of the plans.

4 REFERENCES

Brooks, A. 2021. Personal communication, email to Robinson, M., Natural Resource Management Specialist, NOAA Fisheries, regarding Lower Dungeness floodplain restoration project. July 19, 2021.

Busack, C., and K. P. Currens. 1995. Genetic risks and hazards in hatchery operations: Fundamental concepts and issues. AFS Symposium 15:71-80.

Busack, C., and C. M. Knudsen. 2007. Using factorial mating designs to increase the effective number of breeders in fish hatcheries. Aquaculture 273:24-32.

Downen, M. 2025. WDFW. Personal communication, email Morgan Robinson, Natural Resource Management Specialist, NOAA Fisheries, regarding Summer chum escapement. May 14,

2025.
Entrix. 2005. Dungeness Watershed. Pages 2.8-1 to 2.8-88 *in* Shared Strategy for Puget Sound, Volume II. Shared Strategy for Puget Sound Development Committee, Seattle, Washington.
Ford, M. J. (editor). 2022. Biological viability assessment update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. NOAA Technical Memorandum NMFS-NWFSC-171. U.S. Department of Commerce. January 2022. 337 pages. Available at https://doi.org/10.25923/kq2n-ke70.
Gately, G. 2020. Discovery Bay Watershed Water Quality and Fishes: A Comprehensive Review. Washington State Conservation Commission and Jefferson County Environmental Health, Port Hadlock, WA. 04/20/2020. 208 pages.
Haring, D. 1999. Salmon and Steelhead Habitat Limiting Factors: Water Resource Inventory Area 18. Washington State Conservation Commission. December 27, 1999. 202 pages.
HCCC (Hood Canal Coordinating Council). 2005. Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan. Hood Canal Coordinating Council. November, 2005. Available at https://repository.library.noaa.gov/view/noaa/16122.
HSRG. 2004. Hatchery Reform: Principles and Recommendations of the Hatchery Scientific Review Group. Prepared for Long Live the Kings. April 2004. 329 pages.
McElhany, P., M. H. Rucklelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units. NOAA Technical Memorandum NMFS-NWFSC-42. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, WA. June 2000. 156 pages.
Myers, J. M., J. J. Hard, E. J. Connor, R. A. Hayman, R. G. Kope, G. Lucchetti, A. R. Marshall, G. R. Pess, and B. E. Thompson. 2015. Identifying Historical Populations of Steelhead within the Puget Sound Distinct Population Segment. March 2015. U.S. Dept. Commer., NOAA Technical Memorandum NMFS NWFSC-128. 175 pages.
NMFS. 2007. Final Supplement to the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan. May 16, 2007. 54 pages.
NMFS. 2012. Effects of Hatchery Programs on Salmon and Steelhead Populations: Reference Document for NMFS ESA Hatchery Consultations. December 3, 2012. Northwest Region, Salmon Management Division, Portland, Oregon. 50p.
NMFS. 2020. Endangered Species Act Section 7(a)(2) Biological Opinion for NMFS Sustainable Fisheries Division's determinations on salmon and steelhead hatchery programs in Puget Sound under limit 6 of the ESA 4(d) rules for listed salmon and steelhead in Puget Sound (50 CFR § 223.203(b)(6)). NMFS Consultation Number: WCRO 2020-01366. November 4, 2020. 81 pages.
NWIFC and WDFW. 2006. The Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Northwest Indian Fisheries Commission and Washington Department of Fish and Wildlife, Olympia, WA. Revised July 2006. 38 pages.
PSIT, and WDFW. 2010. Puget Sound Steelhead Harvest Management Plan. Available from Washington Department of Fish and Wildlife, Olympia, Washington. January 7, 2010.

224p.
Puget Sound Salmon Management Plan. 1985. *United States of America vs. State of Washington* No. 9213 Phase I (sub no. 85-2). October 17, 1985. Order Adopting Puget Sound Salmon Management Plan. 50p.
Sands, N. J., K. Rawson, K. P. Currens, W. H. Graeber, M. H. Ruckelshaus, R. R. Fuerstenberg, and J. B. Scott. 2009. Determination of Independent Populations and Viability Criteria for the Hood Canal Summer Chum Salmon Evolutionarily Significant Unit. NOAA Tech. Memo., NMFS-NWFSC-101. U.S. Dept. of Commerce. August 2009. 71 pages.
Scott, J. B., and W. T. Gill (editors). 2008. *Oncorhynchus mykiss*: Assessment of Washington State's Steelhead Populations and Programs. Preliminary draft edition. Washington Fish & Wildlife Commission, Olympia, Washington. 424 pages.
USFWS. 2025. Reinitiation of formal consultation for NMFS 4(d) Rule Determinations for Washington Department of Fish and Wildlife Chinook Salmon (USFWS Reference No. 2014-F-0132 and 2022-0041653) and Chum Salmon (USFWS Reference No. 2025-0015096) Hatchery Programs in the Dungeness River Watershed. Memo to Jording, J. NMFS. March 14, 2025. 28 pages.
Washington, U. S. v. 1974. 384 F. Supp 312 (W.D. Wash.), aff'd, 500F.2nd 676 (9thCr. 1975, cert. denied), 423 U.S. 1086 (1976), Seattle, Washington.
WDFW. 2020. Dungeness Hatchery HGMP Spring Chinook, Coho Fall-Run Pink Hatchery Programs. Annual Report Calendar Year 2020. 38 pages.
WDFW. 2023. Hatchery and Genetic Management Plan: Dungeness River Summer Chum Supplementation Hatchery Program. January 24, 2023. 46 pages.
WDFW, and PNPTT. 2000. Summer Chum Salmon Conservation Initiative. An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region. April 2000. 797 pages.