

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:

Minter Creek Fall Chinook
Hatchery Program

**Species or
Hatchery Stock:**

Minter Creek Fall Chinook
(*Oncorhynchus tshawytscha*)

Agency/Operator:

Washington Department of Fish and Wildlife

Watershed and Region:

Minter Creek / Puget Sound

Date Submitted:

Date Last Updated:

January 15, 2013

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Minter Creek Fall Chinook Program

1.2) Species and population (or stock) under propagation, and ESA status.

Minter Creek Fall Chinook (*Oncorhynchus tshawytscha*) - not listed.

1.3) Responsible organization and individuals

Hatchery Operations Staff Lead Contact

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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

Suquamish Tribe: In addition, eggs or fish may be transferred to the Grovers Creek Hatchery/Gorst Creek Rearing Ponds for their fall Chinook program to help them meet their program goals.

Long Live the Kings: Beginning in 2009, Minter Creek Hatchery may also transfer eggs to Glenwood Springs Hatchery (LLTK, San Juan Islands), to supplement fall Chinook egg-take in years when facility needs are not met.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Funding Sources

Puget Sound Recreational Enhancement
(PSRE) fund
Aquatic Lands Enhancement Account (ALEA)
General Fund – State
DJ-Federal
Local

Operational Information

Full time equivalent staff – 4.25
Annual operating cost (dollars) - \$477,772

The above information for annual operating cost applies cumulatively to the Minter Creek Hatchery fish programs and cannot be broken out specifically by program.

1.5) Location(s) of hatchery and associated facilities.

Broodstock Collection; Incubation Locations:

Minter Creek Hatchery: Located on Minter Creek (WRIA 15.0048) at RM 0.5. Minter Creek is a tributary to Carr Inlet on Puget Sound, Washington.

Acclimation; Release Locations:

Minter Creek Hatchery (sub-yearlings)

Hupp Springs Rearing Ponds (yearlings):

Located at RM 3 on Minter Creek (WRIA 15.0048), tributary to Carr Inlet on Puget Sound

1.6) Type of program.

Segregated harvest.

1.7) Purpose (Goal) of program.

Harvest Augmentation. The goal of this program is to provide adult fish for harvest opportunity in Puget Sound terminal marine area recreational and Treaty Indian fisheries. Production from this program may also contribute to harvests and fishing opportunity for directed and incidental Chinook salmon fisheries in British Columbia and Puget Sound pre-terminal fishing areas.

In addition, the program may provide eyed-eggs to the Suquamish Tribal facilities (Grovers Creek Hatchery and Gorst Creek rearing ponds) to help their Chinook program meet their egg-take goal, as well as Long Live the Kings Glenwood Springs Hatchery, as of 2009.

1.8) Justification for the program.

The program produces fall Chinook salmon for harvest in regional recreational fisheries that are of high value to the State of Washington. The Minter Creek Hatchery program is implemented in accordance with the 1993 legislatively-mandated Puget Sound Recreational Enhancement (PSRE) program. Adult fish produced also help meet harvest allocations that are guaranteed through treaties, as affirmed in *U.S. v. Washington (1974)*. Additionally program-origin Chinook salmon also help meet Pacific Salmon Treaty harvest sharing agreements with Canada.

These harvest augmentation objectives are met in a manner that is of low impact to listed Chinook populations. No native natural-origin Chinook population exists in Minter Creek that could be impacted by the hatchery program. Interactions with listed salmon populations in Puget Sound are reduced by relying on localized broodstock, by fully imprinting juveniles through rearing at the release site (to minimize straying) and by releasing fish as smolts (to minimize marine area ecological interactions), as programmed in the Future Brood Document.

To minimize impacts on listed fish by WDFW facilities operation and the Minter Creek yearling Chinook program, the following Risk Aversions are included in this HGMP:

Table 1.8.1: Summary of risk aversion measures for the Minter Creek Fall Chinook yearling program.

| Potential Hazard | HGMP Reference | Risk Aversion Measures |
|--------------------|----------------|---|
| Water Withdrawal | 4.2 | Water rights are formalized through trust water right # S2-21357 for Minter Creek. Monitoring and measurement of water usage is reported in monthly NPDES reports. |
| Intake Screening | 4.2 | The intake screens on Minter Creek Hatchery are in compliance with state and federal guidelines (NMFS 1995, 1996), but do not meet the current Anadromous Salmonid Passage Facility Design criteria (NMFS 2011). Although no wild listed species exist above the intakes, the intake screen structures are scheduled for retrofitting, pending available funding. |
| Effluent Discharge | 4.2 | This facility operates under the "Upland |

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|---------------------------------------|------------------------|--|
| | | Fin-Fish Hatching and Rearing" National Pollution Discharge Elimination System administered by the Washington Department of Ecology (DOE) - WAG 13 – 1024. |
| Broodstock Collection & Adult Passage | 2.2.2, 2.2.3, 4.2, 7.9 | The PS TRT has not identified Minter Creek Chinook as a historical Chinook salmon population. No listed fish passed upstream. All hatchery fish can be identified w/ adipose-fin clip (mass marked). |
| Disease Transmission | 9.2.7 | Co-Managers Fish Disease Policy. Details hatchery practices and operations designed to stop the introduction and/or spread of any diseases. |
| Competition & Predation | 2.2.3, 10.11 | Fish are released at a time, size, and life-history stage to foster rapid migration to marine waters. |

1.9) List of program “Performance Standards”.

See HGMP section 1.10 below. Standards and indicators are referenced from Northwest Power Planning Council (NPPC) Artificial Production Review (APR) (NPPC 2001).

1.10) List of program “Performance Indicators”, designated by "benefits" and "risks."

1.10.1: “Performance Indicators” addressing benefits.

| Benefits | | |
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| Performance Standard | Performance Indicator | Monitoring & Evaluation |
| 3.1.1 Program contributes to fulfilling tribal trust responsibility mandate and treaty rights as described in US v WA. | Contributes to co-manager harvest. | Participate in annual coordination between co-managers to identify and report on issues of interest, coordinate management, and review programs: FBD, North of Falcon, HAIPs. |
| 3.1.2 Program contributes to mitigation requirements. | This program provides mitigation for lost fish production due to development within Puget Sound and contributes to sport, tribal and commercial fisheries. | Survival and contribution to fisheries are estimated for each brood year released. |
| 3.1.3 Program addresses ESA responsibilities. | Program is allowed to continue harvest under ESA Section 4(d). | HGMP updated and re-submitted to NOAA with significant changes or under permit agreement. |
| 3.2.1 Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species. | Annual number of fish produced by program caught in all fisheries, including estimates of fish released. Externally-marked hatchery fish enable mark-selective fisheries, which can reduce directed harvest mortality on wild fish. | Harvests are monitored by agencies to provide up to date information. Fish are 100% adipose fin-clip only. Survival and contribution to fisheries are estimated for each brood year released. |
| 3.3.2 Releases are sufficiently | Percentage of total hatchery | 100% mass-mark rate (ad-only,) |

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| marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population. | releases are identifiable as hatchery-origin fish. 100% Mass-mark (adipose fin-clip only) production fish to identify them from naturally produced fish. | of all hatchery releases. Monitor size, number, date of release and mass mark quality. Returning fish are sampled in fisheries and at hatchery return for CWT recovery. Numbers of estimated hatchery (marked) are recorded annually. |
| 3.4.1 Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of population from which broodstock is taken. | Collection of broodstock is done randomly throughout the entire return period. | Annual run timing, age and sex composition and return timing data are collected. |
| 3.5.5 Juveniles are released at fully-smolted stage. | Smoltification (size fpp/mass CV and condition factor) and behavior monitored in the hatchery (50-80 fpp sub-yearlings, 8-10 fpp yearlings). | Condition of fish monitored in the hatchery throughout rearing stages. Annually monitor size number, date of release. |
| 3.6.1 The hatchery program uses standard scientific procedures to evaluate various aspects of artificial propagation. | Adhere to HSRG (2004) and WDFW spawning guidelines (Seidel 1983). Apply minimal monitoring standards in the hatchery: food conversion rates, growth trajectories, mark/tag rate error, weight distribution (CV). | Annual run timing, age and sex composition data are collected upon adult return. Growth rates, mark rate and size at release and release dates are recorded annually. |
| 3.8.3 Non-monetary societal benefits for which the program is designed are achieved. | Contributes to the cultural benefit that fishing provides. Recreational fishery angler days, length of season, number of licenses purchased. Fish available for tribal ceremonial use. | Annual harvest of hatchery fish based on CWT recoveries, CRC analysis and creel surveys. |

1.10.2: “Performance Indicators” addressing risks.

| Risks | | |
|--|---|---|
| Performance Standard | Performance Indicator | Monitoring & Evaluation |
| 3.2.1 Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species. | Harvest is regulated to meet appropriate biological assessment criteria. Mass-mark juvenile hatchery fish prior to release to enable state agencies to implement selective fisheries. | Harvests and escapements are monitored by agencies to provide up-to-date information. |
| 3.2.2 Release groups are sufficiently marked in a manner consistent with information needs and protocols to enable determination of impacts to natural- and hatchery-origin fish | Percentage of total hatchery releases are identifiable as hatchery-origin fish. Mass-mark (adipose-fin clip, CWT, otolith-mark, other, etc., depending on species) production fish to | Fish are 100% adipose fin-clip only. Survival and contribution to fisheries are estimated for each brood year released (see HGMP |

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| in fisheries. | identify them from naturally produced fish for selective fisheries. | section 2.2.2). |
| 3.3.1 Hatchery program contributes to an increasing number of spawners returning to natural spawning areas. | Total number of spawners, categorized by origin, are monitored (pHOS, spawner-recruit ratios). | Returning fish encountered are examined for the fin-mark upon hatchery return. Numbers of estimated hatchery (marked) are recorded annually (see HGMP section 2.2.2). |
| 3.3.2 Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production and to evaluate effects of the program on the local natural population. | All hatchery production is identifiable in some manner (fin-marks, tags, otolith, etc.) consistent with information needs. | Annual estimates of mass-mark (ad-clip only) rate of all hatchery releases. Returning fish encountered are examined for the fin-mark upon hatchery return. Numbers of estimated hatchery (marked) are recorded annually (see HGMP section 2.2.2). |
| 3.4.1 Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of population from which broodstock is taken. | Collection of broodstock is done randomly throughout the entire return period. | Annual run timing, age and sex composition and return timing data are collected. Adhere to WDFW spawning guidelines. (Seidel 1983). |
| 3.4.2 Broodstock collection does not significantly reduce potential juvenile production in natural rearing areas. | Number of spawners of natural-origin removed for broodstock. | Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003) (see HGMP section 2.2.2). |
| 3.4.3 Life history characteristics of the natural population do not change as a result of this hatchery program. | Life history patterns of juvenile and adult NOR are stable. | Not applicable. Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). |
| 3.5.1 Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production. | Within and between populations, genetic structure is not affected by artificial production. | Not applicable. Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). |
| 3.5.2 Collection of broodstock does not adversely impact the genetic diversity of the naturally-spawning population. | Collection of broodstock is done randomly throughout the entire return period. | Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). Annual run timing, age and sex composition and return timing data are collected. |
| 3.5.3 Hatchery-origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning population. | The ratio of observed and/or estimated total numbers of artificially-produced fish on natural spawning grounds, to total number of naturally-produced fish (pHOS). | Returning fish encountered are examined for the fin-mark upon hatchery return and on the spawning ground. Numbers of estimated hatchery (marked) and natural (unmarked) are recorded annually (see HGMP section 2.2.2). |
| 3.5.4 Juveniles are released on-station, or after sufficient acclimation to maximize homing | Location of release (on-station, acclimation pond, direct plant). | Annual release information, including location (on-station), method (acclimation), type |

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| ability to intended return locations. | Release type (forced, volitional or direct stream release). | (forced) and class (sub-yearlings and yearlings) are recorded in hatchery data systems. |
| 3.5.5 Juveniles are released at fully-smolted stage. | Level of smoltification at release. Fish are released at 50-80 fpp (sub-yearlings) and 8-10 fpp (yearlings). Release type (forced) | Condition of fish monitored in the hatchery throughout rearing stages. Annually monitor size number, date of release. |
| 3.5.6 The number of adults returning to the hatchery that exceeds broodstock needs is declining. | Program is sized appropriately for harvest goals. Numbers of surplus hatchery returns are calculated annually. | Numbers of adults returning to the hatchery, broodstock collected, and surplus returns are recorded annually. |
| 3.6.1 The hatchery program uses standard scientific procedures to evaluate various aspects of artificial propagation. | Adhere to HSRG (2004) and WDFW spawning guidelines (Seidel 1983). Apply minimal monitoring standards in the hatchery: food conversion rates, growth trajectories, mark/tag rate error, weight distribution (CV). | Annual run timing, age and sex composition data are collected upon adult return. Growth rates, mark rate and size at release and release dates are recorded annually. |
| 3.7.1 Hatchery facilities are operated in compliance with all applicable fish health guidelines and facility operation standards and protocols (PNFHPC, WDFW Fish Health Policy, INAD, MDFWP). | Annual reports indicating levels of compliance with applicable standards and criteria. Periodic audits indicating level of compliance with applicable standards and criteria. | Pathologists from WDFW's Fish Health Section monitor program monthly. Exams performed at each life stage may include tests for virus, bacteria, parasites and/or pathological changes, as needed. |
| 3.7.2 Effluent from hatchery facility will not detrimentally affect natural populations. | Discharge water quality compared to applicable water quality standards by NPDES permit. WDFW water right permit compliance. | Flow and discharge reported in monthly NPDES reports. |
| 3.7.3 Water withdrawals and in-stream water diversion structures for artificial production facility operation will not prevent access to natural spawning areas, affect spawning behavior of natural populations, or impact juvenile rearing environment. | Water withdrawals compared to NMFS, USFWS and WDFW applicable passage and screening criteria for juveniles and adults. | Barrier and intake structure compliance assessed and needed fixes are prioritized. |
| 3.7.4 Releases do not introduce pathogens not already existing in the local populations, and do not significantly increase the levels of existing pathogens. | Certification of fish health during rearing and immediately prior to release, including pathogens presence and virulence. | WDFW Fish Health Section inspects adult broodstock yearly for pathogens and monitor juvenile fish on a monthly basis to assess health and detect potential disease problems. As necessary, WDFW's Fish Health Section recommends remedial or preventative measures to prevent or treat disease, with administration of therapeutic and prophylactic |

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| | | treatments as deemed necessary. A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings. |
| 3.7.5 Any distribution of carcasses or other products for nutrient enhancement is accomplished in compliance with appropriate disease control regulations and guidelines, including state, tribal and federal carcass distribution guidelines. | All applicable fish disease policies are followed. | Controls of specific fish pathogens through eggs/fish movements are conducted in accordance to Co-managers Fish Health Disease Policy. Disposition of carcasses are recorded in the WDFW Hatchery Adult Data. |
| 3.7.6 Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally-produced population. | Spatial and temporal spawning distribution of natural populations above and below weir/trap currently compared to historic distribution. | Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003) (see HGMP section 2.2.2). |
| 3.7.7 Weir/trap operations do not result in significant stress, injury or mortality in natural populations. | All observations of natural-origin fish at hatchery facilities are recorded and reported annually. | Trap checked daily. Natural- and hatchery-origin fish recorded annually. |
| 3.7.8 Predation by artificially produced fish on naturally – produced fish does not significantly reduce numbers of natural fish. | Hatchery juveniles are raised to smolt-size and released from the hatchery at a time that fosters rapid migration downstream. | Not applicable. Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003) (see HGMP section 2.2.2). |
| 3.8.1 Cost of program operation does not exceed the net economic value of fisheries in dollars per fish for all fisheries targeting this population. | Annual operational cost of program compared to calculated fishery contribution value (Wegge 2009). | Annual operational cost of program compared to calculated fishery contribution value (Wegge 2009). |
| 3.8.3 Non-monetary societal benefits for which the program is designed are achieved. | Contributes to the cultural benefit that fishing provides. Recreational fishery angler days, length of season, number of licenses purchased. Fish available for tribal ceremonial use. | Agencies and tribes to provide up-to-date information needed to monitor harvests. |

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

Up to 1,300 adults collected annually.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

WDFW shall limit, as the management intent, annual production of fall Chinook for on-station releases at Minter Creek Hatchery to a total maximum of 120,000 yearlings and 1,400,000 sub-yearlings. Limiting juvenile production to current (proposed) levels will help retain, and not forestall, potential future options for the recovery of the listed Puget Sound Chinook ESU.

Table 1.11.2.1 Proposed annual fish release levels (maximum number) by life stage and location.

| Life Stage | Release Location | Annual Release Level |
|---------------|--|----------------------|
| Yearlings | Hupp Springs Ponds, RM 3 Minter Creek (WRIA 15.0048) | 120,000 |
| Sub-yearlings | Minter Creek Hatchery, RM 0.5 Minter Creek (WRIA 15.0048) | 1,400,000 |

WDFW, Future Brood Document 2012.

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

The smolt-to-adult survival for the sub-yearling releases was 0.52% for brood years 2002-2004 (RMIS 2012). Based on the smolt-to-adult survival and programmed release of 1,400,000 the production goal is 7,300 (see HGMP section 3.3.1).

Minter Hatchery initiated a yearling Chinook program in 2008. As of the 2009 brood year, 75,000 fish are adipose fin-clipped + coded-wire tagged (AD+CWT) and 45,000 are adipose fin-clipped only; the data for survival-to-adult analysis and harvest contribution will not be available until 2013-2014.

Table 1.12.1: Minter Creek Hatchery fall Chinook escapement 2000-2011.

| Year | Escapement |
|----------------|--------------|
| 2000 | 7,456 |
| 2001 | 11,184 |
| 2002 | 9,345 |
| 2003 | 5,043 |
| 2004 | 5,302 |
| 2005 | 4,615 |
| 2006 | 12,027 |
| 2007 | 19,389 |
| 2008 | 16,140 |
| 2009 | 8,163 |
| 2010 | 5,922 |
| 2011 | 7,920 |
| Average | 9,376 |

Source Data: Hatchery Database 2008, *Fishbooks* 2012.

1.13) Date program started (years in operation), or is expected to start.

The Chinook program was initiated in 1946.

1.14) Expected duration of program.

Ongoing.

1.15) Watersheds targeted by program.

Minter Creek (WRIA 15.0048).

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

Any alternative actions taken to attain program goals need to still meet sustainable fisheries (Magnuson/Stevens Act), Treaty Indian rights *U.S. v. Washington (1974)* and Pacific Salmon Treaty fish production objectives and approved by the co-managers. The Puget Sound Salmon

Management Plan (PSSMP 1985), a federal court order, describes the co-management responsibilities of WDFW and the tribes with regard to fishery management and artificial production. The PSSMP explicitly states that "no change may be made to the Equilibrium Brood Document (program production goals) without prior agreement of the affected parties."

SECTION 2. PROGRAM EFFECTS ON NMFS ESA-LISTED SALMONID POPULATIONS. (USFWS ESA-Listed Salmonid Species and Non-Salmonid Species are addressed in Addendum A)

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None currently. This HGMP is submitted to NOAA Fisheries for ESA consultation, and determination regarding compliance of the plan with ESA section 4(d) rule criteria for joint state/tribal hatchery resource management plans affecting listed Chinook salmon and steelhead.

2.2) Provide descriptions, status, and projected take actions and levels for NMFS ESA-listed natural populations in the target area.

2.2.1) Description of NMFS ESA-listed salmonid population(s) affected by the program.

- Identify the NMFS ESA-listed population(s) that will be directly affected by the program.

None directly.

- Identify the NMFS ESA-listed population(s) that may be incidentally affected by the program.

Puget Sound Chinook (*Oncorhynchus tshawytscha*): Listed as *Threatened* on March 24, 1999 (64FR14308); *Threatened* status reaffirmed on June 28, 2005 (70FR37160); reaffirmed *Threatened* by five-year status review, completed August 15, 2011 (76FR50448). The Puget Sound Chinook salmon ESU is composed of 31 historically quasi-independent populations, of which 22 are believed to be extant currently. The ESU includes all naturally-spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Strait of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington, as well as twenty-six artificial propagation programs (Ford 2011). The Technical Recovery Team (TRT) did not find any evidence that an independent population of Chinook salmon existed in Minter Creek or other nearby South Sound tributaries (Ruckelshaus et al. 2006).

Puget Sound steelhead (*Oncorhynchus mykiss*): Were listed as *Threatened* under the ESA on May 11, 2007 (72FR26722); reaffirmed *Threatened* by five-year status review, completed August 15, 2011 (76FR50448). The DPS includes all naturally spawned anadromous winter-run and summer-run *O. mykiss* (steelhead) populations, below natural migration barriers in the river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, Washington (Ford 2011). This DPS is bounded to the west by the Elwha River (inclusive) and to the north by the Nooksack River and Dakota Creek (inclusive), and also includes the Green River natural, Elwha natural, White River natural and Hood Canal winter-run steelhead hatchery stocks. In the South Puget Sound region, the TRT has preliminarily delineated one demographically independent population (DIP) of winter steelhead; (South Puget Sound), no summer run populations were identified in the region (PSSTRT 2011).

2.2.2) Status of NMFS ESA-listed salmonid population(s) affected by the program.

- Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds.

Minter Creek fall Chinook in the Puget Sound Chinook ESU. Minter Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 16, 2005). The stock is designated as Category 2b. This stock was founded from fish that are considered part of the ESU, but is released outside of its native watershed. Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). In this watershed, adult Chinook salmon returns and any resulting natural production are dependent upon local hatchery program production. The available habitat is not judged to be typical, productive fall Chinook habitat and would not likely support a self-sustaining, naturally spawning fall Chinook salmon population.

Puget Sound Chinook salmon: Updated Risk Summary. All Puget Sound Chinook populations are below the TRT planning range for recovery escapement levels. Most populations are also consistently below the spawner recruit levels identified by the TRT as consistent with recovery. Across the ESU, most populations have declined in abundance somewhat since the last status review in 2005, and trends since 1995 are mostly flat. Several of the risk factors identified by Good et al. (2005) are also still present, including high fractions of hatchery fish in many populations and widespread loss and degradation of habitat. Many of the habitat and hatchery actions identified in the Puget Sound Chinook recovery plan are expected to take years or decades to be implemented and to produce significant improvements in natural population attributes, and these trends are consistent with these expectations. Overall, the new information on abundance, productivity, spatial structure and diversity since the 2005 review does not indicate a change in the biological risk category since the time of the last BRT status review (Ford 2011).

South Puget Sound winter-run steelhead in the Puget Sound steelhead DPS. The status of winter-run steelhead in the South Puget Sound is currently unknown. Based on a preliminary intrinsic potential (IP) estimate by the PSSTRT (2011), the capacity for winter steelhead in this DIP is approximately 8,312 adults.

Puget Sound Steelhead: Updated Risk Summary. The status of the listed Puget Sound steelhead DPS has not changed substantially since the 2007 listing. Most populations within the DPS are showing continued downward trends in estimated abundance, a few sharply so (Ford 2011). For all but a few putative demographically independent populations of steelhead in Puget Sound, estimates of mean population growth rates obtained from observed spawner or redd counts are declining—typically 3 to 10% annually—and extinction risk within 100 years for most populations in the DPS is estimated to be moderate to high, especially for *draft* populations in the *putative* South Sound and Olympic MPGs. Collectively, these analyses indicate that steelhead in the Puget Sound DPS remain at risk of extinction throughout all or a significant portion of their range in the foreseeable future, but are not currently in danger of imminent extinction.

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage or other measures of productivity for the listed population.

South Puget Sound Chinook (*Oncorhynchus tshawytscha*): Listed Chinook populations are not known to occur in the South Puget Sound (See HGMP section 2.2.2).

South Puget Sound winter-run steelhead (*Oncorhynchus mykiss*): Productivity data for South Puget Sound winter-run steelhead is not available.

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

South Puget Sound Chinook (*Oncorhynchus tshawytscha*): Listed Chinook populations are not known to occur in the South Puget Sound (See HGMP section 2.2.2).

South Puget Sound winter-run steelhead (*Oncorhynchus mykiss*): Limited spawning surveys have been conducted by WDFW staff in recent years. These surveys have not documented the presence of adult steelhead or redds in any of the streams monitored.

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

South Puget Sound Chinook (*Oncorhynchus tshawytscha*): Listed Chinook populations are not known to occur in the South Puget Sound (see HGMP section 2.2.2).

South Puget Sound winter-run steelhead (*Oncorhynchus mykiss*): Hatchery steelhead are not currently released in South Puget Sound and the level of hatchery winter run steelhead spawners straying from outside the basin is unknown. Due to timing differences between early Chambers stock steelhead and a majority of the existing wild winter or summer stocks (February – June), interaction on the spawning grounds is unclear.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of NMFS listed fish in the target area, and provide estimated annual levels of take.

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

The PSTRT has not identified Minter Creek as a Chinook salmon population and as such no impacts are anticipated. See HGMP section 2.2.2.

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

Not applicable

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

See "Take" table at end of HGMP.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Not applicable

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. Hood Canal Summer Chum Conservation Initiative) or other regionally accepted policies (e.g. the NPPC Annual Production Review Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

WDFW hatchery programs in Puget Sound operate under and adhere to *U.S. v Washington* (1974) which provides the legal framework for coordinating these programs, defining artificial production; objectives *Comprehensive Management Plan for Puget Sound Chinook* (WDFW 2004); and the Hatchery Action Implementation Plan (HAIP) for the watershed (see HGMP section 3.4).

Hatchery Reform- Principles and Recommendations of the Hatchery Scientific Review Group. WDFW programs have incorporated the suggestions this report provided, in a detailed description of the HSRG’s scientific framework, tools and resources developed for evaluating hatchery programs, the processes used to apply these tools, and the resulting principles, system-wide recommendations, and program-specific recommendations to reform (HSRG 2004). See also HGMP section 6.2.3.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

This hatchery program, and all other WDFW anadromous salmon hatchery programs within the Puget Sound Chinook ESU, operates under *U.S v Washington* (1974) and the *Puget Sound Salmon Management Plan* (PSSMP 1985) and the *Hood Canal Salmon Management Plan* (HCSMP) (PNPTC et al. 1986), which provides the legal framework for coordinating these programs, defining artificial production objectives, and maintaining treaty-fishing.

Hatchery salmon and steelhead production levels are detailed in the annual *Future Brood Document*. The Future Brood Document (FBD) is a pre-season planning document for fish hatchery production in Washington State for upcoming brood stock collection and fish rearing seasons (July 1 – June 30). The FBD is coordinated between WDFW, the Northwest Indian Fisheries Commission (NWIFC) representing Puget Sound and coastal treaty tribes, eastern Washington treaty tribes, and Federal fish hatcheries.

See also HGMP section 3.1.

3.3) Relationship to harvest objectives.

Tribal and non-tribal commercial and recreational fisheries directed at fall Chinook and other species produced through WDFW hatchery releases will be managed to minimize incidental effects to listed Chinook salmon and summer chum salmon. Compliance with the fisheries management strategy defined in the *Summer Chum Salmon Conservation Initiative* (SCSCI) (WDFW and PNPTT 2000) will lead to fisheries on WDFW hatchery-origin stocks that are not likely to adversely affect listed Chinook or listed summer chum.

Each year, state, federal and tribal fishery managers plan the Northwest's recreational and commercial salmon fisheries. The pre-season planning process, known as the North of Falcon (NoF) process involves a series of public meetings between federal, state, tribal and industry representatives and other concerned citizens. NoF coincides with meetings of the Pacific Fishery Management Council, which sets the ocean salmon seasons at these meetings.

3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

Table 3.3.1.1: Minter Creek Hatchery sub-yearling Fall Chinook fishery contributions.

| | | |
|-------------------------|-----------------------|----------------------------|
| Brood Years: 2002-2004 | | |
| Fishery Years:2006-2008 | | |
| Average SAR%* | | 0.52 |
| <i>Agency</i> | <i>Non-WA Fishery</i> | <i>% of total Survival</i> |
| ADFG | All | 0.9 |
| CDFO | All | 20.8 |
| NMFS | All | 1.1 |
| ODFW | All | 0.9 |
| <i>Agency</i> | <i>WA Fishery</i> | <i>% of total Survival</i> |

| | | |
|--------------|--------------------------|--------------|
| WDFW | 10- Ocean Troll | 2.1 |
| WDFW | 15- Treaty Troll | 6.0 |
| WDFW | 23- PS Net | 24.3 |
| WDFW | 41- Ocean Sport- Charter | 0.4 |
| WDFW | 42- Ocean Sport- Private | 0.7 |
| WDFW | 45- PS Sport | 14.8 |
| WDFW | 50- Hatchery Escapement | 27.3 |
| SUQ | 54- Spawning ground | 0.2 |
| WDFW | 54- Spawning ground | 0.5 |
| Total | | 100.0 |

Source: RMIS 2012.

*Average SAR% = (tags recovered/tags released).

3.4) Relationship to habitat protection and recovery strategies.

The Minter Creek Hatchery program is part of WDFW-managed plans under the Co-Manager's Non-Chinook Resource Management Plan (RMP) for Puget Sound region non-Chinook salmon hatchery programs.

Hatchery Action Implementation Plans (HAIPs) are watershed-level documents developed by the western Washington Treaty Tribes (Tribes) and WDFW, which consolidate descriptions of hatchery programs from each watershed into a single document. This document addresses co-manager priorities, legal requirements of the Puget Sound Salmon Management Plan (PSSMP) and Endangered Species Act (ESA), and recommendations of the Hatchery Scientific Review Group (HSRG). It describes the adaptation of general principles for hatchery management to the unique genetic and ecological setting of each watershed. The HAIPs also describe how hatchery programs will operate in conjunction with harvest management, habitat restoration, and habitat protection to achieve near- and long-term goals for natural and hatchery production of salmon in each watershed, as well as listing funded and unfunded capital and operating/monitoring needs for all state and tribal hatchery programs and facilities. Each HAIP will also outline the monitoring and evaluation needs and describe the co-manager's adaptive management approach.

Salmon Recovery Funding Board (SRFB). Created by the Legislature in 1999, the SRFB is composed of five citizens appointed by the Governor and five state agency directors, the Board provides grant funds to protect or restore salmon habitat and assist related activities. It works closely with local watershed groups known as lead entities (see below). The Board supports salmon recovery by funding habitat protection and restoration projects, and related programs and activities that produce sustainable and measurable benefits for fish and their habitat.

Lead Entities. The Lead Entity for the East Kitsap Peninsula and Minter Creek is Kitsap County (see also http://www.rco.wa.gov/salmon_recovery/lead_entities.shtml).

RFEGs: Several citizen based groups in conjunction with local governments work on habitat actions to benefit both listed and non-listed stock in the system including the South Puget Sound Salmon Enhancement Group (RFEG).

Shared Strategy Plan. An ESU-wide recovery planning effort was undertaken by Shared Salmon Strategy for Puget Sound, a collaborative group dedicated to restoring salmon throughout Puget Sound (online at <http://www.sharedsalmonstrategy.org>).

3.5) Ecological interactions.

- (1) *Salmonid and non-salmonid fishes or other species that could negatively impact the program.*
Negative impacts by fishes and other species on the Chinook program could occur directly through predation on program fish, or indirectly through food resource competition, genetic

effects, or other ecological interactions. In particular, fishes and other species could negatively impact Chinook survival rates through predation on newly released, emigrating juvenile fish in freshwater, estuarine and marine areas. Certain avian and mammalian species may also prey on juvenile Chinook while the fish are rearing at the hatchery site, if these species are not excluded from the rearing areas. Species that could potentially negatively impact juvenile Chinook through predation include the following:

- Avian predators, including mergansers, cormorants, belted kingfishers, great blue herons, and night herons
- Mammalian predators, including mink, river otters, harbor seals, and sea lions
- Cutthroat trout

Rearing and migrating juvenile and adult Chinook originating through the program may also serve as prey for large, mammalian predators in nearshore marine areas, the estuary and in freshwater areas downstream of the hatchery in the watershed to the detriment of population abundance and the program's success in augmenting harvest. Species that may negatively impact program fish through predation may include:

- Orcas
- Sea lions
- Harbor seals
- River otters

(2) *Salmonid and non-salmonid fishes or other species that could be negatively impacted by the program).*

- Puget Sound Chinook
- Puget Sound steelhead

(3) *Salmonid and non-salmonid fishes or other species that could positively impact the program.*

Fish species that could positively impact the program may include other salmonid species and trout present in the watershed through natural and hatchery production. Juvenile fish of these species may serve as prey items for the Chinook during their downstream migration in freshwater and into the marine area. Decaying carcasses of spawned adult fish may contribute nutrients that increase productivity in the watershed, providing food resources for the emigrating Chinook. Salmonid adults that return to the basin and any seeding efforts using adult salmon carcasses may provide a source of nutrients and stimulate stream productivity. Many watersheds in the Pacific Northwest appear to be nutrient-limited (Gregory et al. 1987; Kline et al. 1997) and salmonid carcasses can be an important source of marine derived nutrients (Levy 1997). Carcasses from returning adult salmon have been found to elevate stream productivity through several pathways, including: 1) the releases of nutrients from decaying carcasses has been observed to stimulate primary productivity (Wipfli et al. 1998); 2) the decaying carcasses have been found to enrich the food base of aquatic invertebrates (Mathisen et al. 1988); and 3) juvenile salmonids have been observed to feed directly on the carcasses (Bilby et al. 1996). Addition of nutrients has been observed to increase the production of salmonids (Slaney and Ward 1993; Slaney et al. 2003; Ward et al. 2003).

(4) *Salmonid and non-salmonid fishes or other species that could be positively impacted by the program.* The Chinook program could positively impact freshwater and marine fish species that prey on juvenile and adult fish. Nutrients provided by decaying Chinook carcasses may also benefit fish in freshwater. These species include:

- Southern Resident Killer Whale
- Northern pikeminnow
- Cutthroat trout
- Steelhead
- Coho salmon
- Pacific staghorn sculpin
- Numerous marine pelagic fish species

SECTION 4. WATER SOURCE

- 4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.**

Table 4.1.1: Water sources available at Minter Creek and Hupp Springs facilities.

| Facility | Water Source | Available Water Flow (gpm) | Temp .(°F) | Usage | Limitations |
|---------------------|------------------------|-----------------------------------|-------------------|---|--|
| Minter Creek | Minter Creek (Surface) | 8,600 | 38-48 | Broodstock collection, incubation, rearing, acclimation | Low summer water flows (July, August), Clogged intake screens during winter floods (limit available water flow in December, January) |
| | Wells (3) | 1,000 Total | 49-50 | Incubation | Wells water rich in iron causes soft egg shell disease. |
| Hupp Springs | Spring | 1,700 | 46-48 | Rearing, acclimation | No limitation. |
| | Minter Creek (Surface) | 350 | 38-40 | Supplemental source to spring water | Very limited usage, due to clogged intakes. |

Minter Creek Hatchery. Surface and well water are both used in the production at Minter Creek Hatchery.

Three wells provide pathogen-free, ambient water used exclusively for incubation, especially for eggs shipped to other facilities. The high mineral content (iron) in the well water causes soft-shell disease; salt is added to decrease the problem, but egg mortality could be as high as 25%. The well water is also passed through a de-nitro tower to improve dissolved oxygen content.

Water quality from Minter Creek varies greatly, depending on weather and the time of the year. Heavy debris during periods of high flow can clog the water intake screens, which limits flow into the facility. Also silt deposits require occasional “rodding”.

Fish are reared on reuse water, which can present an increased risk of fish disease and elevated mortality in the spring when the rearing densities are high.

Water rights at Minter Creek Hatchery are regulated through permit # S2-21357.

Hupp Springs Rearing Ponds. Spring water is used in the production at Hupp Springs. Surface water from Minter Creek is used as supplemental source to the spring water.

Pathogen-free spring water is used for rearing. Water is supplied from an artesian spring (Hupp Springs) located ¼ mile upstream from the hatchery. An intake situated at the lower end of the spring collects water; this water is then transported via a pipeline to the hatchery. Water at the Hupp Springs facility is 100% gravity fed and supplies between 1500 - 1700 gallons per minute (gpm).

The water right permit at Hupp Spring ponds is S2-25031.

- 4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.**

Minter Creek Hatchery: Has two intake structures: a gravity intake with 1.0" x 0.094" screens, and a pump intake with 4.0" x 0.156" wedge-wire screens. Although no wild listed species exist

above the intakes, the intake screen structures are scheduled for retrofitting, pending available funding.

This facility operates under the “Upland Fin-Fish Hatching and Rearing” National Pollution Discharge Elimination System (NPDES) general permit which conducts effluent monitoring and reporting and operates within the limitations established in its permit administered by the Washington Department of Ecology (DOE), WAG 13-1024. Monthly and annual reports on water quality sampling, use of chemicals at this facility, compliance records are available from DOE.

Discharges from the cleaning treatment system are monitored as follows:

- *Total Suspended Solids (TSS)* 1 to 2 times per month on composite effluent, maximum effluent and influent samples.
- *Settleable Solids (SS)* 1 to 2 times per week on effluent and influent samples.
- *In-hatchery Water Temperature* - daily maximum and minimum readings.

Table 4.2.1: Record of NPDES permit compliance at Minter Creek Hatchery.

| Facility/ Permit # | Reports Submitted Y/N | | | Last Inspection Date | Violations Last 5 yrs (see list) | Corrective Actions Y/N | Meets Compliance Y/N |
|-------------------------|--------------------------|-------|--------|----------------------------|--|------------------------------|----------------------------|
| | Monthly | Qtrly | Annual | | | | |
| Minter Cr WAG13-1024 | Y | Y | Y | 5/16/2005 | 0 | N | Y |

Source: Ann West, WDFW Hatchery Data Unit.

Hupp Springs: The facility meets guidelines which do not require “Upland Fin-Fish Hatching and Rearing” National Pollution Discharge Elimination System (NPDES) general permit (>20,000 lbs total on site production and > 5,000 lbs of fish feed per month).

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Fish collected at Minter Creek Hatchery are trapped using a barrier dam which directs returning adults into a concrete step ladder. A sorter located at the end of the ladder allows for species separation into any one of four 20' x 120' x 4' holding ponds. Fish may also be directed upstream (e.g., coho salmon and cutthroat) and downstream when necessary (e.g. ponds too crowded).

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

A 300-gallon steel tanker truck equipped with aerators and oxygen tanks is available for transportation at the facility. A larger tank can be borrowed from another facility, as needed.

5.3) Broodstock holding and spawning facilities.

Minter Creek has four 20' x 140' x 4' concrete raceways used as broodstock holding ponds. They are filled with creek water, covered with bird netting (scheduled for replacement in 2012) and equipped with water sprinklers. Spawning takes place in the shaded area on the western side of the ponds.

5.4) Incubation facilities.

Table 5.4.1: Incubation facilities available at Minter Creek Hatchery.

| Type | Number | | | Size |
|---------------------------|--------|---------------|---------------|-----------|
| | Rooms | Stacks | Trays (Total) | |
| Vertical Heath incubators | 8 | 20 | 2,560 | 24" x 25" |
| Troughs | 4 | 3' x 17' x 3' | Troughs | 4 |

Minter Creek Hatchery has vertical Heath stack incubators in eight rooms, with 320 trays per room. This allows the facility to keep eggs separate by species and/or facility-origin. Eggs destined for transfer or which are transferred from other facilities are incubated on pathogen-free well water. Eggs for on-station release are incubated on surface water; however, water mixed from both sources is also available and used when needed.

5.5) Rearing facilities.

Table 5.5.1: Pond facilities available at Minter Creek Hatchery.

| Pond Type | Number | Dimensions |
|--------------------|--------|-----------------|
| Fiberglass troughs | 4 | 3' x 17' x 3' |
| Concrete Raceway | 5 | 20' x 140' x 4' |
| | 4 | 20' x 120' x 4' |
| | 12 | 10' x 100' x 4' |

Table 5.5.2: Pond facilities available at Hupp Springs Rearing Ponds.

| Pond Type | Number | Dimensions |
|--------------------|--------|-----------------|
| Standard raceway | 4 | 10' x 100' x 4' |
| Gravel-bottom pond | 1 | 1/5 acre |

5.6) Acclimation/release facilities.

Minter Creek Hatchery: Fish are acclimated on Minter Creek water during the entire rearing period. Fish are reared and released directly from the rearing ponds into Minter Creek.

Hupp Springs ponds: In addition to Hupp Springs water, yearling Chinook are acclimated to surface water (Minter Creek) from mid-February until release in mid-April. Acclimation water is pumped from Minter Creek at a rate of 350gpm.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

None.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Fish rearing is conducted in compliance with the co-managers Fish Health Policy (WDFW and WWTIT 1998, updated 2006). Adherence to artificial propagation, sanitation and disease control practices defined in the policy should reduce the risk of fish disease pathogen transfers.

Minter Creek Hatchery: A member of the hatchery crew is on stand-by at all times to monitor hatchery operations and respond to any unexpected events. The facility is equipped with low-water alarms and a back-up generator in case of power loss.

Hupp Springs Rearing Ponds: Is equipped with an alarm system run by a primary power source of 110 volts and a 12-volt battery auxiliary. Ponds 1-4 have low flow alarms and Pond 5 has a float alarm. Fencing equipped with an intrusion sensor surrounds the standard ponds (where the adults are held). All alarms are connected to Minter Creek Hatchery, which is staffed 7 days a week, 24 hours a day.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Adult Chinook salmon collected from the Minter Creek Hatchery. Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). Minter Creek Chinook are not considered a viable population segment in the Puget Sound ESU, nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005).

6.2) Supporting information.

6.2.1) History.

The Minter Creek Hatchery fall Chinook stock originated through transfers of Green River-lineage fish from Samish and Deschutes Hatcheries, where the Green River stock had previously been transplanted and established. Rivers Inlet (British Columbia) stock was introduced as broodstock at Minter Creek on one occasion in the mid-1970s, for a potential recreational fisheries enhancement measure. Only localized fall Chinook adult returns established through juvenile fish releases into Minter Creek have been used as broodstock since the early 1990s.

6.2.2) Annual size.

Up to 1,300 adults collected annually. No natural-origin fish are included.

6.2.3) Past and proposed level of natural fish in broodstock.

Levels of naturally-produced fish used as broodstock are unknown prior to 100% mass-marking of Minter Creek Chinook of the 1997 brood. Production is managed as a segregated program, so only hatchery-origin fish are used. This was 100% attainable starting in 2003. As there is no natural production either above the hatchery and/or downstream of the hatchery trap, it is anticipated that there will be no "wild" Chinook trapped at Minter Creek.

6.2.4) Genetic or ecological differences.

Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). The hatchery population is localized to the release location, and no measures have been applied to maintain the genetic or ecological characteristics of the original donor, transplanted Green River-lineage population.

6.2.5) Reasons for choosing.

The program uses the introduced and locally-adapted hatchery stock established in, and returning to, Minter Creek.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). Minter Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005).

The program is isolated from listed natural-origin Chinook salmon populations, and no adverse genetic or ecological effects are likely as a result of broodstock selection practices.

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults.

7.2) Collection or sampling design.

Returning fall Chinook are collected at the hatchery throughout the entire run (August through October). A barrier dam directs adults into a concrete step ladder. A sorter located at the end of

the ladder allows for species separation into any one of four 20'x120'x4' holding ponds. Fish may also be directed upstream (e.g., coho salmon and cutthroat) and downstream when necessary (e.g. ponds too crowded).

Spawning takes place after September 15.

7.3) Identity.

All hatchery-origin fish released through this program were mass-marked (adipose fin-clipped only) through 2011. Starting in 2012, the portion of the fish released from the Hupp Springs facility will also be ad-clipped and coded-wire tagged (Ad+CWT).

Coded-wire tagged fish allows identification not only as hatchery-origin but also by release site.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

Up to 1,300 adults collected annually.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Table 7.4.2.1: Composition of fall Chinook broodstock spawned at Minter Creek Hatchery, 2000-2011.

| Year | Adults | | Jacks |
|----------------|-------------|-------------|----------|
| | Females | Males | |
| 2000 | 980; (232*) | 908; (180*) | 9; (0*) |
| 2001 | 619 | 629 | 8 |
| 2002 | 482 | 486 | 1 |
| 2003 | 520 | 543 | 3 |
| 2004 | 537 | 558 | 3 |
| 2005 | 496 | 500 | 10 |
| 2006 | 529 | 584 | 3 |
| 2007 | 504 | 520 | 1 |
| 2008 | 949 | 945 | 12 |
| 2009 | 401 | 412 | 21 |
| 2010 | 591 | 585 | 16 |
| 2011 | 231 | 231 | 0 |
| Average | 570 | 575 | 9 |

Source: WDFW Hatchery Database, 2009, FishBooks 2012, (2011-12 data preliminary).

* Number in italics are for Coulter Creek Hatchery.

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Fall Chinook adults collected at Minter Creek, surplus to egg take needs, are removed from the system. These fish are killed and are either sold to the contracted fish buyer, supplied to food banks or made available for nutrient enhancement projects. A policy of not passing fall Chinook upstream of the Minter Creek rack was instituted with the 2000 return.

7.6) Fish transportation and holding methods.

Adults are not transported for this program.

7.7) Describe fish health maintenance and sanitation procedures applied.

Standard fish health protocols, as defined in the Co-manager Fish Health Policy (WDFW and WWTIT 1998, updated 2006) are adhered to. No antibiotics or formalin treatment is applied.

7.8) Disposition of carcasses.

Spawned and unspawned carcasses are picked up and/or disposed of by the contracted buyer. Mortalities are buried on station.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). Broodstock is selected randomly from all hatchery-origin returning adults.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Fish for broodstock are selected randomly as they ripen, across the entire maturation time frame. In order to emphasize the later part of the run, broodstock is spawned in order of 5%, 50% and 45% to represent early, mid- and late run.

8.2) Males.

All males collected, including jacks, are considered for spawning and are chosen randomly on any spawning day. Jacks are used at rate of 5%-10% of spawned males.

8.3) Fertilization.

Adults are spawned 1:1. Eggs from each female are collected separately and mixed with milt from one male (pair-wise spawning), and are allowed 60 seconds for fertilization. Fertilized eggs are combined into 2-gallon buckets and taken to the incubation room, where they are moved to the vertical trays and water hardened for one hour in an iodophor solution of 100 ppm.

8.4) Cryopreserved gametes.

Cryopreserved gametes are not used.

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

Adults to be spawned are chosen randomly from the available gene pool. Every attempt is made to ensure that the egg-take is representative of the entire run.

In an effort to minimize directed, artificial selection of traits that could negatively affect this listed population, proper spawning protocols are implemented to maximize the representation of each individual adult into the entire brood.

SECTION 9. INCUBATION AND REARING -

Specify any management goals (e.g. “egg to smolt survival”) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

The current egg-take goal (FBD 2012) for the program is 2,600,000. All eggs are collected and incubated at Minter Creek Hatchery. Rearing and releases take place at the Minter Creek and Hupp Springs facilities.

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Table 9.1.1: Survival rates from egg-take to ponding, Minter Creek Hatchery fall Chinook, 2005-2011.

| Brood Year | Eggs Collected | Survival Rates (%) | |
|------------|----------------|--------------------|-------------------|
| | | Green-to-Eye Up | Eye-Up-to-Ponding |
| 2005 | 2,076,400 | 96.6 | 98.0 |
| 2006 | 2,293,000 | 85.9 | 98.0 |
| 2007 | 2,323,400 | NA | NA |
| 2008 | 4,081,000 | 93.6 | 98.0 |
| 2009 | 1,901,900 | 88.9 | 94.6 |
| 2010 | 2,524,200 | 98.8 | 91.0 |
| 2011 | 1,693,710 | 94.5 | 97.0 |
| Average | 2,413,373 | 93.1 | 96.1 |

Source: Hatchery Records, 2011. Survival rates not available for years prior to 2005.

Note: Minter Creek supports the incubation phase (4.6-million) of the Tumwater Falls Chinook program. The egg take for this program is at Tumwater Falls, as is not part of the Minter egg take goal). The unfed fry are then shipped to Coulter Creek for early rearing (see Tumwater Falls fall Chinook HGMP).

9.1.2) Cause for, and disposition of surplus egg takes.

No extra eggs are collected for this program.

9.1.3) Loading densities applied during incubation.

Eggs are placed in vertical incubators at 6,500 per tray.

9.1.4) Incubation conditions.

Eggs with the destination for on-station releases are incubated on surface water. Due to siltation issues, rodding is necessary four to five times per week.

Eggs destined for final transfer to the Gorst Creek and Hupp Springs rearing ponds are incubated on pathogen-free well water.

Water flow in the incubation trays is 4.5gpm. Vexar™ layers are placed in trays as a substrate substitute.

Once eyed, eggs are shocked and dead eggs are removed. A portion of 700,000 eyed eggs is transferred to the Grover Creek Hatchery (Suquamish Tribe).

9.1.5) Ponding.

When fish are 95%+ buttoned up (January), they are moved from trays into 20'x100'x4" raceways filled with surface water.

Also in January, 135,000 unfed fry at approximately 1,050 fpp, are transferred to Hupp Springs, for rearing and release.

9.1.6) Fish health maintenance and monitoring.

All fertilized eggs are water-hardened in an iodophor solution. Fungus in the incubators is controlled by formalin drip (15-minute injection per day at a target dose of 1,667-ppm formalin)

throughout incubation to just prior to hatching. Once eyed, eggs are shocked and dead eggs are removed. Fry loss is picked at the time of ponding and then daily.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Fall Chinook eggs are incubated in separate, isolated incubation rooms to minimize the risk of inter-stock disease transmission during this stage. Eggs destined for transfers to other facilities are incubated on pathogen-free well water.

All water systems are connected to 24-hr/day low water alarms and an emergency backup generator.

9.2) Rearing:

9.2.1) Provide survival rate data (average program performance) by hatchery life stage (fry to sub-yearling; sub-yearling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available.

Table 9.2.1.1: Survival rates from fry to sub-yearling smolts, Minter Creek fall Chinook 2005-2011.

| Brood Year | Survival Rates (%) |
|------------|-------------------------------|
| | Fry-to-Sub-yearling (Release) |
| 2005 | 95.1 |
| 2006 | 97.9 |
| 2007 | NA |
| 2008 | 97.4 |
| 2009 | 94.5 |
| 2010 | 95.2 |
| 2011 | 98.5 |
| Average | 96.4 |

Source: Hatchery Records 2011. Survival rates not available for years prior to 2005.

9.2.2) Density and loading criteria (goals and actual levels).

Loading and density levels at WDFW hatcheries conform to standards and guidelines set forth in Fish Hatchery Management (Piper et al. 1982) and co-managers Fish Health Policy (WDFW and WWTIT 1998, updated 2006). Fish rearing densities are maintained at maximum less than 3 lbs of fish /gpm at release and under 0.35 lbs / ft³.

Chinook are generally split at 3 lbs/gpm and released at 5 lbs/gpm.

Actual levels reached are 4.50lbs/gpm and a density index of less than 0.2.

9.2.3) Fish rearing conditions

Minter Creek Hatchery fish are reared until release in 10'x200'x4' raceways on Minter Creek surface water. Fish are marked in March at 200 fpp. Maximum density at release for the sub-yearling program is 0.54-pounds/cubic foot (lbs/ft³).

Fish transferred to Hupp Springs rearing ponds are placed in 10'x 100'x 4' standard raceways. In November, fish are moved to the gravel-bottom pond and kept there until release, and are reared on spring water. Final rearing density at release is 1.26 lbs/ft³.

Table 9.2.3.1: Monthly average surface water temperature (°F) at Minter Creek.

| Month | Minter Creek Average Water Temperature (°F) |
|-----------|---|
| January | 42 |
| February | 42 |
| March | 43 |
| April | 47 |
| May | 48 |
| June | 52 |
| July | 55 |
| August | 53 |
| September | 53 |
| October | 49 |
| November | 44 |
| December | 43 |

Source: Hatchery Records 2012.

9.2.4) Indicate biweekly or monthly fish growth information (average program performance), including length, weight, and condition factor data collected during rearing, if available.

Table 9.2.4.1: Average size (fpp), by month, of juvenile fall Chinook reared at Minter Creek and Hupp Springs facilities.

| Month | Average Size (fpp) | |
|-----------|--------------------|-----------|
| | Sub-yearlings | Yearlings |
| January | 973 | 828 |
| February | 482 | 460 |
| March | 261 | 244 |
| April | 132 | 109 |
| May | 80 | 86 |
| June | | 71 |
| July | | 56 |
| August | | 46 |
| September | | 37 |
| October | | 30 |
| November | | 25 |
| December | | 20 |
| January | | 17 |
| February | | 12 |
| March | | 10 |
| April | | 8 |

Source: Hatchery Records 2012.

9.2.5) Indicate monthly fish growth rate and energy reserve data (average program performance), if available.

Not available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (average program performance).

Fall Chinook are fed a variety of diet formulations including starter, crumbles, and pellets of Bio-Oregon and EWOS brand. Feeding frequencies vary depending on the fish size and water temperature and usually begin at 8 feedings/7 days a week and end at one feeding/3 days a week. Feed rates vary from 1.5% to 2.25% B.W./day for subyearlings and 0.5% to 1.8% B.W./day for yearlings. The overall season food conversion rate is approximately 0.5-0.65:1 for subyearlings and 0.85:1 for yearlings.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Fish health is monitored on a daily basis by hatchery staff and at least monthly by a state Fish Health Specialist. Hatchery personnel carry out treatments prescribed. Procedures are consistent with the Co-Manager's Fish Health Policy (1998, updated 2006).

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

The migratory state of the release population is determined by fish behavior. Aggressive screen and intake crowding, leaner condition factors, a more silvery physical appearance and loose scales during feeding events are signs of smolt development. ATPase activity is not measured.

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

No "NATURES" type rearing methods are applied through the program.

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

Listed fish are not propagated through this program. All reasonable and prudent measures are employed to minimize rearing and incubation losses. These include the use of quality well water for incubation, use of high quality feeds for rearing, rearing densities and loadings that conform to best management practices and frequent fish health inspections.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels.

The current Minter Creek fall Chinook on-station release goal is 1.4-million sub-yearlings at 50-80 fpp. An additional 120,000 yearling smolts are released from Hupp Springs ponds at 8-10 fpp. The yearling program was initiated with the 2008 brood (2010 releases).

Table 10.1.1: Proposed release levels.

| Age Class | Max Number | Size (fpp) | Release Date | Location |
|---------------|------------|------------|--------------|--------------|
| Sub-yearlings | 1,400,000 | 80 | May | Minter Creek |
| Yearling | 120,000 | 8 | March-April | Minter Creek |

Source: WDFW, Future Brood Document 2012.

Note: Fish averaging 10 fpp in weight may be estimated to average ~ 160 mm in fork length.

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Minter Creek (WRIA 15.0048)
Release point: RM 0.5 (Minter Creek Hatchery);
RM 3 (Hupp Springs rearing ponds)
Major watershed: Minter Creek, Henderson Bay, Carr Inlet
Basin or Region: Puget Sound

10.3) Actual numbers and sizes of fish released by age class through the program.

The sub-yearling program has been released from Minter Creek Hatchery, with the exception of the 2010 release (2009 brood). The yearling program, also released at Minter Creek Hatchery, was initiated with the 2008 brood (released in 2010). Starting in 2012 (2010 brood), the yearling program was moved to Hupp Springs Rearing Ponds for rearing, acclimation and release; all yearling releases will occur from the Hupp Springs facility, while the sub-yearling program remains at Minter Creek Hatchery.

Table 10.3.1: Sub-yearling and yearling fall Chinook s releases at Minter Creek Hatchery, 2000-2011.

| Release Year | Sub-yearling | Avg. size (fpp) | CV | Yearling | Avg. size (fpp) | CV |
|----------------|------------------------|-----------------|------------|----------------|-----------------|------------|
| 2000 | 1,975,600 | 74 | ----- | ----- | ----- | ----- |
| 2001 | 1,844,650 | 75 | 7.4 | ----- | ----- | ----- |
| 2002 | 1,892,500 | 74 | 6.5 | ----- | ----- | ----- |
| 2003 | 1,876,675 | 73 | 6.5 | ----- | ----- | ----- |
| 2004 | 1,714,725 | 67 | 6.1 | ----- | ----- | ----- |
| 2005 | 1,869,623 | 75 | 7.4 | ----- | ----- | ----- |
| 2006 | 1,888,932 | 80 | 6.8 | ----- | ----- | ----- |
| 2007 | 1,895,477 | 77 | 10.8 | ----- | ----- | ----- |
| 2008 | 1,992,545 | 70 | 6.8 | ----- | ----- | ----- |
| 2009 | ^a 1,913,502 | 65 | ----- | ----- | ----- | ----- |
| 2010 | ^b ----- | ----- | ----- | 141,811 | 8 | ----- |
| 2011 | 1,402,570 | 77 | ----- | 136,773 | 10 | 8.0 |
| Average | 1,842,436 | 73 | 7.3 | 139,292 | 9 | 8.0 |

Source: WDFW Hatchery Plants database, 2011, FishBooks 2012.

^a In 2009, releases included two groups: 1,840,262 fish at 78 fpp, released in May; and 73,240 fish at 24 fpp released in July. The new yearling program was proposed at 250,000, but was reduced to 120,000, thus necessitating the early release in July.

^b The sub-yearling program was briefly suspended (2008 brood released in 2010) due to a funding shortage. The program was shifted to PSRE funds in 2010.

10.4) Actual dates of release and description of release protocols.

Table 10.4.1: Release dates, by age, Minter Creek Hatchery, 2000-2011.

| Release Year | Release Date(s) | |
|--------------|------------------------|-----------|
| | Sub-yearlings | Yearlings |
| 2000 | April 26-27 | ----- |
| 2001 | May 1,8 | ----- |
| 2002 | April 29, May 8 | ----- |
| 2003 | May 12-13 | ----- |
| 2004 | May 7, 10 | ----- |
| 2005 | May 9-11 | ----- |
| 2006 | May 10-11 | ----- |
| 2007 | May 8-10 | ----- |
| 2008 | May 12, 16, 19 | ----- |
| 2009 | May 5, 13, 20; July 24 | ----- |

| | | |
|-------------|------------|----------------------|
| 2010 | ----- | February 24; March 2 |
| 2011 | May 13, 25 | May 3 |

Sub-yearlings: Fish at Minter Creek Hatchery are usually force-released/pumped out of the ponds. They can also be released through the pipe system leading to the stream.

Yearlings: As of 2012, fish are volitionally-released from Hupp Springs ponds during high tides to prevent them from becoming entrapped within tide pools that form at low tides. Previous releases were from Minter Creek Hatchery.

10.5) Fish transportation procedures, if applicable.

Minter Creek Hatchery has a 300-gallon steel tanker truck equipped with aerators and oxygen tanks available for transportation. A larger tank can be borrowed from another facility, if needed.

10.6) Acclimation procedures.

All fish are acclimated on surface water (Minter Creek) from ponding to release.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

Table 10.7.1: Numbers released, by age, and mark type.

| Brood Year | Class | Release | Mark Type |
|-------------|--------------|-----------|-----------|
| 2011 | Sub-yearling | 1,400,000 | Ad-only |
| | Yearling | 30,000 | Ad-only |
| | | 90,000 | AD+CWT |

WDFW, Future Brood Document 2011.

The sub-yearling component of this program has been 100% adipose fin-clipped since brood year 1998 and for brood years 2002-2004 a 200,000 group also received coded-wire tags. The yearling program was initiated with the 2008 brood, and were released adipose fin-clipped only. Coded-wire tagging of Minter Creek yearlings began with the 2009 brood (75,000 Ad+CWT and 45,000 ad-only – current CWT rates are higher). Therefore, data for yearling survival-to-adult analysis and harvest contribution will not be available until 2013-2014.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

None anticipated.

10.9) Fish health certification procedures applied pre-release.

Prior to release, fish health is monitored and the fish health status of the population is certified by a WDFW Fish Health Specialist.

10.10) Emergency release procedures in response to flooding or water system failure.

Emergency release procedures involved removal of screens to allow fish migration. During a flood or drought event, fish may be released earlier than scheduled to prevent possible fish loss.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

Historically, fall-run Chinook salmon were not present in Minter Creek (SSHAG 2003). Therefore there are no existing natural populations of listed Chinook in the Minter Creek that could be directly affected as a result of fish releases from this program.

In addition, coefficient of variation (CV) for length at release of 10.0% or less is desirable in order to increase the likelihood that most of the fish are ready to migrate (Fuss and Ashbrook 1995). The average CVs for release years' 2001-2008 was 7.3% for sub-yearlings.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of “Performance Indicators” presented in Section 1.10.

Elements of the annual Monitoring and Evaluation plan for this program are identified in HGMP section 1.10. The purpose of a monitoring program is to identify and evaluate the benefits and risks that may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

Each production group is identified with distinct otolith marks, adipose clips, coded wire tags, blank wire tags or other identification methods as they become available, to allow for evaluation of each particular rearing and/or release strategy. This will allow for selective harvest on hatchery stocks when appropriate, monitoring of interactions of hatchery and wild fish wherever they co-mingle in riverine, estuarine and marine habitats and assessment of the status of the target population. WDFW shall monitor the Chinook salmon escapement into the target and non-target Chinook populations to estimate the number of tagged, un-tagged and marked fish escaping into the river each year and the stray rates of hatchery Chinook into the rivers.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each “Performance Indicator” identified for the program.

These fish are 100% mass-marked (adipose-fin clip only) which will allow for selective fisheries (harvest opportunity) in mixed stock areas to minimize impacts on weak or protected stocks as well as identifying the hatchery fall Chinook production and the NOR/HOR spawning ground ratios.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

Funding and resources are currently committed to monitor and evaluate this program.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Monitoring and evaluation will be undertaken in a manner that does not result in an unauthorized take of listed Chinook.

SECTION 12. RESEARCH

12.1) Objective or purpose.

Not applicable.

12.2) Cooperating and funding agencies.

Not applicable.

12.3) Principle investigator or project supervisor and staff.

Not applicable.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

Not applicable.

- 12.5) Techniques: include capture methods, drugs, samples collected, tags applied.**
Not applicable.
- 12.6) Dates or time period in which research activity occurs.**
Not applicable.
- 12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.**
Not applicable.
- 12.8) Expected type and effects of take and potential for injury or mortality.**
Not applicable.
- 12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached “take table” (Table 1).**
Not applicable.
- 12.10) Alternative methods to achieve project objectives.**
Not applicable.
- 12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.**
Not applicable.
- 12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.**
Not applicable.

SECTION 13. ATTACHMENTS AND CITATIONS

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SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

“I hereby certify that the information provided is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.”

Name, Title, and Signature of Applicant:

Certified by _____ Date: _____

DRAFT

ADDENDUM A. PROGRAM EFFECTS ON OTHER (AQUATIC OR TERRESTRIAL) ESA-LISTED POPULATIONS. (Anadromous salmonid effects are addressed in Section 2)

15.1) List all ESA permits or authorizations for USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species associated with the hatchery program.

The WDFW and the USFWS have a Cooperative Agreement pursuant to section 6(c) of the Endangered Species Act that covers the majority of the WDFW actions, including hatchery operations.

"The department is authorized by the USFWS for certain activities that may result in the take of bull trout, including salmon/steelhead hatchery broodstocking, hatchery monitoring and evaluation activities and conservation activities such as adult traps, juvenile monitoring, spawning ground surveys..."

15.2) Describe USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species and habitat that may be affected by hatchery program.

Several listed and candidate species are found in Pierce County; however the hatchery operations and facilities for this program do not fall within the critical habitat for any of these species. As such there are no effects anticipated for these species.

Listed or candidate species:

"No effect" for the following species:

Canada Lynx (*Lynx canadensis*) –Threatened [critical habitat designated]

Gray Wolf (*Canis lupus*) –Threatened

Grizzly bear (*Ursus arctos horribilis*) –Threatened

Northern Spotted owl (*Strix occidentalis caurina*) –Threatened [critical habitat designated]

Marbled murrelet (*Brachyramphus marmoratus*) –Threatened [critical habitat designated]

Water howellia (*Howellia aquatilis*) –Threatened

Marsh Sandwort (*Arenaria paludicola*) [historic]

Golden Paintbrush (*Castilleja levisecta*) [historic]

Candidate Species

Fisher (*Martes pennanti*) – West Coast DPS

Mardon skipper (*Polites mardon*)

(Roy Prairie and Tacoma) Mazama pocket gopher (*Thomomys mazama* ssp. *glacialis* and *tacomensis*) [historic]

North American wolverine (*Gulo gulo luteus*) – contiguous U.S. DPS

Oregon spotted frog (*Rana pretiosa*)

Streaked horned lark (*Eremophila alpestris strigata*)

Taylor's checkerspot (*Euphydryas editha taylori*)

Yellow-billed cuckoo (*Coccyzus americanus*)

Whitebark pine (*Pinus albicaulis*)

15.3) Analyze effects.

Not applicable

15.4) Actions taken to minimize potential effects.

Not applicable

15.5) References

Not applicable

There are no existing natural populations of listed species in the Minter Creek

Table 1a. Estimated listed salmonid take levels of by hatchery activity.

| | | | | |
|---|---|---|--------------|----------------|
| Listed species affected: Fall Chinook (<i>Oncorhynchus tshawytscha</i>) | ESU/Population: Puget Sound Chinook | Activity: Minter Creek Fall Chinook Program | | |
| Location of hatchery activity: Minter Creek Hatchery, RM 0.5Minter Creek (WRIA 15.0048) | Dates of activity: August- June | Hatchery program operator: WDFW | | |
| Type of Take | Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>) | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass a) | - | - | - | - |
| Collect for transport b) | - | - | - | - |
| Capture, handle, and release c) | - | - | - | - |
| Capture, handle, tag/mark/tissue sample, and release d) | - | - | - | - |
| Removal (e.g. broodstock) e) | - | - | - | - |
| Intentional lethal take f) | - | - | - | - |
| Unintentional lethal take g) | - | - | - | - |
| Other Take (specify) h) | - | - | - | - |

- a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
- b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
- c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
- d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
- e. Listed fish removed from the wild and collected for use as broodstock.
- f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
- g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
- h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.
2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).
3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.

Table 1b. Estimated listed salmonid take levels of by hatchery activity.

| | | | | |
|---|---|-----------------------|---|----------------|
| Listed species affected: <i>Steelhead (Oncorhynchus mykiss)</i> | ESU/Population: Puget Sound Steelhead | | Activity: Minter Creek Fall Chinook Program | |
| Location of hatchery activity: Minter Creek Hatchery, RM 0.5Minter Creek (WRIA 15.0048) | Dates of activity: August- June | | Hatchery program operator: WDFW | |
| Type of Take | Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>) | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass a) | - | - | - | - |
| Collect for transport b) | - | - | - | - |
| Capture, handle, and release c) | - | - | 2* | - |
| Capture, handle, tag/mark/tissue sample, and release d) | - | - | - | - |
| Removal (e.g. broodstock) e) | - | - | - | - |
| Intentional lethal take f) | - | - | - | - |
| Unintentional lethal take g) | - | - | - | - |
| Other Take (specify) h) | - | - | - | - |

* There were 2 wild steelhead trapped in last 7 years.

- a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
- b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
- c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
- d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
- e. Listed fish removed from the wild and collected for use as broodstock.
- f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
- g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
- h. Other takes not identified above as a category.

Attachment 1. Definition of terms referenced in the HGMP template.

Augmentation - The use of artificial production to increase harvestable numbers of fish in areas where the natural freshwater production capacity is limited, but the capacity of other salmonid habitat areas will support increased production. Also referred to as “fishery enhancement”.

Critical population threshold - An abundance level for an independent Pacific salmonid population below which: compensatory processes are likely to reduce it below replacement; short-term effects of inbreeding depression or loss of rare alleles cannot be avoided; and productivity variation due to demographic stochasticity becomes a substantial source of risk.

Direct take - The intentional take of a listed species. Direct takes may be authorized under the ESA for the purpose of propagation to enhance the species or research.

Evolutionarily Significant Unit (ESU) - NMFS definition of a distinct population segment (the smallest biological unit that will be considered to be a species under the Endangered Species Act). A population will be/is considered to be an ESU if 1) it is substantially reproductively isolated from other conspecific population units, and 2) it represents an important component in the evolutionary legacy of the species.

Harvest project - Projects designed for the production of fish that are primarily intended to be caught in fisheries.

Hatchery fish - A fish that has spent some part of its life-cycle in an artificial environment and whose parents were spawned in an artificial environment.

Hatchery population - A population that depends on spawning, incubation, hatching or rearing in a hatchery or other artificial propagation facility.

Hazard - Hazards are undesirable events that a hatchery program is attempting to avoid.

Incidental take - The unintentional take of a listed species as a result of the conduct of an otherwise lawful activity.

Integrated harvest program - Project in which artificially propagated fish produced primarily for harvest are intended to spawn in the wild and are fully reproductively integrated with a particular natural population.

Integrated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), and fish produced are intended to spawn in the wild or be genetically integrated with the targeted natural population(s). Sometimes referred to as “supplementation”.

Isolated harvest program - Project in which artificially propagated fish produced primarily for harvest are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Isolated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), but the fish produced

are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Mitigation - The use of artificial propagation to produce fish to replace or compensate for loss of fish or fish production capacity resulting from the permanent blockage or alteration of habitat by human activities.

Natural fish - A fish that has spent essentially all of its life-cycle in the wild and whose parents spawned in the wild. Synonymous with *natural origin recruit (NOR)*.

Natural origin recruit (NOR) - See *natural fish* .

Natural population - A population that is sustained by natural spawning and rearing in the natural habitat.

Population - A group of historically interbreeding salmonids of the same species of hatchery, natural, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.

Preservation (Conservation) - The use of artificial propagation to conserve genetic resources of a fish population at extremely low population abundance, and potential for extinction, using methods such as captive propagation and cryopreservation.

Research - The study of critical uncertainties regarding the application and effectiveness of artificial propagation for augmentation, mitigation, conservation, and restoration purposes, and identification of how to effectively use artificial propagation to address those purposes.

Restoration - The use of artificial propagation to hasten rebuilding or reintroduction of a fish population to harvestable levels in areas where there is low, or no natural production, but potential for increase or reintroduction exists because sufficient habitat for sustainable natural production exists or is being restored.

Stock - (see "Population").

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Viable population threshold - An abundance level above which an independent Pacific salmonid population has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year time frame.

Attachment 2. Age class designations by fish size and species for salmonids released from hatchery facilities.

(generally from Washington Department of Fish and Wildlife, November, 1999).

| SPECIES/AGE CLASS | | Number of fish/pound | <u>SIZE/CRITERIA</u> Grams/fish |
|-------------------|-------------------------|----------------------|------------------------------------|
| X | Chinook Yearling | ≤20 | ≥23 |
| X | Chinook (Zero) Yearling | >20 to 150 | 3 to <23 |
| X | Chinook Fry | >150 to 900 | 0.5 to <3 |
| X | Chinook Unfed Fry | >900 | <0.5 |
| X | Coho Yearling 1/ | <20 | ≥23 |
| X | Coho Sub-yearling | >20 to 200 | 2.3 to <23 |
| X | Coho Fry | >200 to 900 | 0.5 to <2.3 |
| X | Coho Unfed Fry | >900 | <0.5 |
| X | Chum Fry | ≤1000 | ≥0.45 |
| X | Chum Unfed Fry | >1000 | <0.45 |
| X | Sockeye Yearling 2/ | ≤20 | ≥23 |
| X | Sockeye Sub-yearling | >20 to 8000 | 0.6 to <23 |
| X | Sockeye Fall Releases | >150 | >2.9 |
| X | Sockeye Fry | >800 to 1500 | 0.3 to <0.6 |
| X | Sockeye Unfed Fry | >1500 | <0.3 |
| X | Pink Fry | ≤1000 | ≥0.45 |
| X | Pink Unfed Fry | >1000 | <0.45 |
| X | Steelhead Smolt | ≤10 | ≥45 |
| X | Steelhead Yearling | ≤20 | ≥23 |
| X | Steelhead Fry | >20 to 150 | 3 to <23 |
| X | Steelhead Unfed Fry | >150 | <3 |
| X | Cutthroat Yearling | ≤20 | ≥23 |
| X | Cutthroat Sub-yearling | >20 to 150 | 3 to <23 |
| X | Cutthroat Fry | >150 | <3 |
| X | Trout Legals | ≤2.5 | ≥225 |
| X | Trout Fry | >2.5 | <225 |

1/ Coho yearlings defined as meeting size criteria and 1 year old at release, and released prior to June 1st.

2/ Sockeye yearlings defined as meeting size criteria and 1 year old.