HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

DRAFT

Hatchery Program	Minter Creek Fall Chinook Fingerling 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	August 04, 2005
Date Last Updated	July 27, 2005

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Minter Creek Fall Chinook - Fingerling 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

Name (and title):	Ron Warren, Region 6 Fish Program Manager Denis Popochock, Complex Manager	
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

In addition to WDFW's Minter Creek Hatchery production, fish are transferred to NOAA Fisheries Manchester for research and to Gorst Creek for the WDFW / Suquamish yearling program (part of the egg take goal at Minter).

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

Operational Information	Number
Annual operating cost (dollars)	$385,998
The above information for annual operating cost applies cumulatively to the Minter Creek Hatchery Fish Programs and cannot be broken out specifically by program. Funding sources are General Fund – State, Puget Sound Recreational Enhancement Fund and the Aquatic Lands Enhancement Account.	

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

Broodstock Collection; Incubation; Rearing and Release:
The Minter Creek Hatchery: Located on Minter Creek (15.0048) at RM 0.5. Minter Creek is a tributary to Carr Inlet on Puget Sound, Washington.

1.6) Type of program.

Isolated harvest. The proposed isolated strategy for this program is based on WDFW's assessment of the genetic characteristics of the hatchery stock and local natural populations, the current and anticipated productivity of the habitat used by the populations, the potential for successfully implementing programs as integrated, and NOAA's final listing determinations (64 FR 14308, June 28, 2005). Modification of the proposed strategy may occur as additional information is collected and analyzed.

1.7) Purpose (Goal) of program.

The goal of this program is release 1,800,000 chinook fingerlings to provide adult fish for harvest in Puget Sound terminal marine area recreational and Treaty Indian fisheries. Production from this program also contributes to harvests and fishing opportunity for directed and incidental chinook salmon fisheries in British Columbia and Puget Sound preterminal fishing areas.

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. Adult fish produced also help meet Indian fishery harvest allocations that are guaranteed through treaties, as affirmed in *U.S. v. Washington.* 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 chinook salmon populations in Puget Sound are reduced by relying on localized broodstock, by fully imprinting fall chinook juveniles through rearing at the Minter Creek release site (to minimize straying) and by releasing juvenile fish as fingerling 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 fingerling chinook program, the following Risk Aversions are included in this HGMP:

Table 1. Summary of risk aversion measures for the Minter Creek chinook 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	At Minter Creek Hatchery, there are two intake structures; a gravity intake with 1.0" x .094" screens, and a pump intake with 4.0" x .156" wedge-wire screens. 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 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	4.2, 7.9, 2.2.3	The PS TRT has not identified Minter Creek as a 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	See sections 2.2.3 & 10.11

1.9) List of program "Performance Standards".

1.10) List of program "Performance Indicators".

Benefits:

Benefits		
Performance Standard	**Performance Indicator**	**Monitoring & Evaluation**
Assure that hatchery operations support Puget Sound Salmon Management Plan (US v Washington), the Shared Strategy for Salmon Recovery, production and harvest objectives.	Contribute to a meaningful harvest for sport, tribal and commercial fisheries. Achieve a 10-year average for smolt-to-adult survival of similar PS fingerling programs that includes harvest plus escapement.	Survival and contribution to fisheries will be estimated for each brood year released. Work with co-managers to manage adult fish returning in excess of broodstock needs.
Maintain outreach to enhance public understanding, participation and support of WDFW hatchery programs.	Provide information about agency programs to internal and external audiences. For example, local schools and special interest groups tour the facility to better understand hatchery operations. Off station efforts may include festivals, classroom participation, stream adoptions and fairs.	Evaluate use and/or exposure of program materials and exhibits as they help support goals of the information and education program. Record on-station organized education and outreach events.
Program contributes to fulfilling tribal trust responsibility mandates and treaty rights.	Follow pertinent laws, agreements, policies and executive and judicial orders on consultation and coordination with Native American tribal governments.	Participate in annual coordination meetings between the co-managers to identify and report on issues of interest, coordinate management, and review programs (FBD process).
Implement measures for broodstock management to maintain integrity and genetic diversity.	A minimum of 500 adults (1,400) are collected throughout the spawning run in proportion to timing, age, and sex composition of return.	Annual run timing, age, and sex composition and return timing data are collected. Adhere to HSRG (2004) and WDFW spawning guidelines (WDFW 1983)
Region-wide, groups are marked in a manner consistent with information needs and protocols to estimate impacts to natural and hatchery-origin fish.	Use mass-mark (adipose-fin clip only) for selective fisheries with additional groups Ad + CWT (200,000 for 2003 release) for evaluation purposes.	Returning fish are sampled throughout their return for length, sex, mass marks and coded-wire tags.

Maximize survival at all life stages using disease control and disease prevention techniques. Prevent introduction, spread or amplification of fish pathogens. Follow Co-Managers Fish Disease Policy (1998).	Necropsies of fish to assess health, nutritional status and culture conditions.	WDFW Fish Health Section inspect 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 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.
	Release and/or transfer exams for pathogens and parasites.	1 to 6 weeks prior to transfer or release, fish are examined in accordance with the Co-Managers Fish Health Policy.
	Inspection of adult broodstock for pathogens and parasites.	At spawning, lots of 60 adult broodstock are examined for pathogens.
	Inspection of off-station fish/eggs prior to transfer to hatchery for pathogens and parasites.	Control of specific fish pathogens through eggs/fish movements is conducted in accordance to Co-managers Fish Health Disease Policy.

Risks:

Risks		
Performance Standard	**Performance Indicator**	**Monitoring & Evaluation**
Minimize impacts and/or interactions to ESA listed fish.	Hatchery operations comply with all state and federal regulations. Hatchery juveniles are raised to smolt-size (80 fish/lb) and released from the hatchery at a time that fosters rapid migration downstream. Mass mark production fish to identify them from naturally produced fish (except CWT only groups).	As identified in the HGMP: Monitor size, number, date of release and mass mark quality. Additional WDFW projects: straying, instream evaluations of juvenile and adult behaviors, NOR/HOR ratio on the spawning grounds, fish health documented.
Artificial production facilities are operated in compliance with all applicable fish health guidelines, facility operation standards and protocols including HOPPS, Co-managers Fish Health Policy and drug usage mandates from the Federal Food and Drug Administration.	Hatchery goal is to prevent the introduction, amplification or spread of fish pathogens that might negatively affect the health of both hatchery and natural reproducing stocks and to produce healthy smolts that will contribute to the goals of this facility.	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, if needed.
Ensure hatchery operations comply with state and federal water quality and quantity standards through proper environmental monitoring.	NPDES permit compliance WDFW water right permit compliance	Flow and discharge reported in monthly NPDES reports.
Water withdrawals and in-stream water diversion structures for hatchery facility will not affect spawning behavior of natural populations or impact juveniles.	Hatchery intake structures meet state and federal guidelines where located in fish bearing streams.	All fish entering the hatchery are documented: Hatchery records. Visual observations recorded. Barrier and intake structure compliance assessed and needed fixes are prioritized.
Hatchery operations comply with ESA responsibilities.	WDFW completes an HGMP and is issued a federal and state permit when applicable.	Identified in HGMP and Biological Opinion for hatchery operations.
Harvest of hatchery-produced fish minimizes impact to wild populations.	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.	Agencies and tribes to provide up-to-date information monitor harvests.

1.11) Expected size of program.

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

The combined egg take goal for the Minter Creek Hatchery is approximately 2.4 million eggs, which includes 2.0 million eggs for the Minter Creek program (1.8 million on-station release) and 200,000 for the Gorst Creek yearling program (2003 broodyear, no eggs were needed for the Gorst Creek/Grovers Creek programs). In addition, 60,000 unfed fry are shipped to the NOAA Fisheries Manchester Lab, but are not released. Broodstock requirements for these programs are approximately 1,400 total adults, assuming a 1:1 sex ratio and a 10% pre-spawning mortality. More adults are required if eggs are needed to support the Tumwater Falls or Gorst Creek fingerling chinook programs (see above).

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 release at Minter Creek Hatchery to a total maximum of 1,800,000 fingerlings or sub-yearlings. Limiting juvenile production to current (proposed) levels will help retain, and not forestall, potential future options for the recovery of the listed chinook ESU.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingerling	Minter Creek (15.0048)	1,800,000
Yearling		

Note: The NOAA Fisheries Manchester Lab gets 60,000 unfed fry, but no release takes place (has been eliminated, 2004).

Note 2: Minter Creek, via Coulter Creek Hatchery (not part of egg take goal at Minter), supports the early rearing portion of the Tumwater Falls fingerling chinook program (not part of egg take goal at Minter). 1.8 million at ~150 fish per pound (fpp) are shipped to Tumwater Falls in April and an additional 1 million are shipped, in two lots, in May. 215,000 eyed eggs are shipped to Grover's Creek Hatchery (Suquamish tribe) for the WDFW / Suquamish yearling program at Gorst Creek (part of the egg take goal at Minter, if needed).

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 most recent on-station release to be tagged was the 2003 broodyear. No complete data at this time. The only tagged groups of fingerling fall chinook with complete smolt-to-adult survival information reared and released from Minter Creek were 79-81 broodyears.

Broodstock levels back to the hatchery rack for brood years 1995 through 2003 were 1,065, 574, 3,799, 8,492, 10,474, 7,456, 11,184, 9,345 and 5,043, respectively.

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

1946 (Salo and Noble, 1953)

1.14) Expected duration of program.

Ongoing.

1.15) Watersheds targeted by program.

Minter Creek (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*) and Pacific Salmon Treaty fish production objectives and approved by the co-managers. The Puget Sound Salmon Management Plan (PSSMP), 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 ESA-LISTED SALMONID POPULATIONS.

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

During 2004-05, WDFW is writing HGMP's to cover all stock/programs produced at the Minter Creek complex for authorization under the 4(d) rule of the ESA.

Harvest management of chinook populations within Puget Sound is implemented through the draft Puget Sound Comprehensive Chinook Management Plan (PSCCMP) - Harvest Management Component (Puget Sound Indian Tribes and WDFW, March 2004).

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

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

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

There are no ESA-listed natural salmonid populations in the program target area. Salo and Bayliff (1958) indicated that there was not an indigenous fall chinook stock in Minter Creek. In this watershed, adult chinook 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 population. If the local hatchery production program was terminated, it is expected that natural chinook production in this watershed (potentially resulting from natural spawning by hatchery fish downstream of the Minter Creek weir), would eventually disappear. These opinions could be tested by identifying all hatchery fall chinook production in this watershed and monitoring natural production /productivity.

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).

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

Puget Sound Chinook

2.2.2) Status of 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

See Co-manager's (Puget Sound) Technical Review Team (2003) for the status of the listed Puget Sound chinook relative to "critical" and "viable" population thresholds.

See SaSI (2002) for the stock status of listed Puget Sound chinook populations.

- 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. Indicate the source of these data.

NA

- 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.

NA

- 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.

NA

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of 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.

WDFW is unaware of any studies that have empirically estimated the competition risks to listed White River spring chinook posed by this program. Studies conducted in other areas indicate that this program is likely to pose a minimal risk of competition:

1) Flagg et al. (2000) concluded, "By definition, hatchery and wild salmonids will not compete unless they require the same limiting resource. Thus, the modern enhancement strategy of releasing salmon and steelhead trout as smolts markedly reduces the potential for hatchery and wild fish to compete for resources in the freshwater rearing environment. Miller (1953), Hochachka (1961), and Reimers (1963), among others, have noted that this potential for competition is further reduced by the fact that many hatchery salmonids have developed different habitat and dietary behavior than wild salmonids."

Flagg et al (2000) also stated “It is unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the estuarine environment.”

WDFW is unaware of any studies that have empirically estimated the predation risks to listed White River spring chinook posed by this program in the *marine* environment. NOAA Fisheries (2002) reviewed existing information on the risks of predation in the marine environment posed by artificial production programs and concluded:

> "1) Predation by hatchery fish on natural-origin smolts or sub-adults is less likely to occur than predation on fry. Chinook salmon, after entering the marine environment, generally prey upon fish one-half their length or less and consume, on average, fish prey that is less than one-fifth of their length. (Brodeur 1991). During early marine life, predation on natural origin chinook will likely be highest in situations where large, yearling-sized hatchery fish encounter fry (SIWG, 1984). Studies by Seiler et al (2002) have shown that the size of the natural origin chinook entering the marine environment at that time is too large for predation.
>
> "2) Likely reasons for apparent low predation rates on chinook juveniles by larger chinook is described by Cardwell and Fresh (1979). These reasons included: 1) due to rapid growth, natural-origin chinook are better able to elude predators and are accessible to a smaller proportion of predators due to size alone; 2) because chinook have dispersed, they are present in low densities relative to other fish and 3) there has either been learning or selection for some predator avoidance." In recent literature review of chinook salmon food habits and feeding ecology in Pacific Northwest marine waters, Buckley (1999) concluded that cannibalism and intra-generic predation by chinook salmon are rare events.

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).

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

NA

-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.

NA

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.

The Minter Creek Hatchery fall chinook salmon HGMP is included as one of 29 WDFW-managed plans under the co-managers' Resource Management Plan (RMP) for Puget Sound region chinook salmon hatcheries. This HGMP is in alignment with the RMP, which serves as the overarching, comprehensive plan for state and tribal chinook salmon hatchery operations in the region.

As affirmed in the co-managers' RMP, WDFW hatchery programs in Puget Sound must adhere to a number of guidelines, policies and permit requirements in order to operate. These constraints are designed to limit adverse effects on cultured fish, wild fish and the environment that might result from hatchery practices. Following is a list of guidelines, policies and permit requirements that govern WDFW hatchery operations:

Genetic Manual and Guidelines for Pacific Salmon Hatcheries in Washington. These guidelines define practices that promote maintenance of genetic variability in propagated salmon (Hershberger and Iwamoto, 1981).

Spawning Guidelines for Washington Department of Fisheries Hatcheries. Assembled to complement the above genetics manual, these guidelines define spawning criteria to be use to maintain genetic variability within the hatchery populations (Seidel, 1983).

Hatchery Reform- Principles and Recommendations of the Hatchery Scientific Review Group. This report provides 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).

Stock Transfer Guidelines. This document provides guidance in determining allowable stocks for release for each hatchery. It is designed to foster development of locally adapted broodstock and to minimize changes in stock characteristics brought on by transfer of non-local salmonids (WDFW 1991).

Fish Health Policy of the Co-managers of Washington State. This policy designates zones limiting the spread of fish pathogens between watersheds, thereby further limiting the transfer of eggs and fish in Puget Sound that are not indigenous to the regions (WDFW, NWIFC, WSFWS 1998).

National pollutant Discharge Elimination System Permit Requirements This permit sets forth allowable discharge criteria for hatchery effluent and defines acceptable practices

for hatchery operations to ensure that the quality of receiving waters and ecosystems associated with those waters are not impaired.

In 1999, several PS and coastal stocks were listed as threatened under the federal Endangered Species Act (ESA). State, tribal and federal managers need to ensure that their hatcheries do not present a risk to listed species. Through this Hatchery Reform Project, the managers have sought to go beyond merely complying with ESA directives. The new approach is to reform hatchery programs to provide benefits to wild salmon recovery and sustainable fisheries. Hatchery management decisions will be based on system-wide, scientific recommendations, providing an important model that can be replicated in other areas.

In addition, the Legislature, in 1999, created the Salmon Recovery Funding Board (SRFB) and the Shared Strategy for Salmon Recovery. Both are collaborative efforts to protect and restore salmon runs across Puget Sound. They bring together the experience and viewpoints of citizens, major state and federal natural resource agencies, local governments, non-government organizations and Puget Sound Tribes. The SRFB provides grant funds to protect or restore salmon habitat and assist related activities that produce sustainable and measurable benefits for fish and their habitat. The Shared Strategy process helps identify what is needed in each watershed to recover salmon habitat through a watershed recovery plan (see section 3.4 for more details).

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* and the Puget Sound Salmon Management Plan (1985). The salmon resource co-management process affirmed through the court order, and under the court approved plan, requires that both the State of Washington and the Puget Sound Tribe(s) develop *Equilibrium Broodstock Programs*. Two documents are completed each year, describing agreed hatchery fish production levels for each brood year. The "Future Brood Document" is a detailed listing of agreed annual juvenile fish production goals. This document is reviewed and updated each spring, and finalized in July. The "Current Brood Document" presents actual juvenile fish production levels relative to the annual production goals. This second document is developed in the spring after eggs spawned that year have been enumerated and actual resultant juvenile fish production levels can be estimated. Through this process, the co-managers document their agreement on the function, purpose and release strategies for all Puget Sound region hatchery programs.

3.3) Relationship to harvest objectives.

Adult chinook salmon produced through the program are managed for harvest in fisheries in accordance with the co-managers' "Puget Sound Comprehensive Chinook Management Plan: Harvest Management Component" that was submitted for ESA review and authorization by NOAA Fisheries in 2003. Under the harvest plan, WDFW and the

affected Treaty Tribes have jointly limited Carr Inlet Treaty and non-Treaty chinook fisheries in order to minimize harvest impacts on White river Spring Chinook as they return to Minter Creek. These protective efforts limit allowable harvest rates on returning Minter Creek Hatchery fall chinook salmon.

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

1978 through 1981 broods were the last tag groups for this program with complete data. There was a 200K cwt group released in 2003. No fisheries contribution data is available from that group yet. The Fishery Regulation Assessment Model (FRAM) used tag recovery data for broodyears 1978-1981 in 2000 to estimate a total fishery exploitation on this stock of 33%, with a total Washington fishery exploitation of 25% (FRAM run #0800, run with final 2000 regulation package). Predicted 2000 exploitation rates, by fisheries, are as follows:

Fishery	Predicted Exploitation Rate
Alaska	1%
Canada	7%
WA Treaty Troll	1%
WA Non-treaty Troll	1%
PS Treaty Troll	2%
PS Sport	16%
PS Treaty Net	5%
PS Non-treaty Net	0%
Total	33%

3.4) Relationship to habitat protection and recovery strategies.

The Legislature, in 1999, created the Salmon Recovery Funding Board (SRFB) and, as indicated earlier, the Shared Strategy for Salmon Recovery. Both are collaborative efforts to protect and restore salmon runs across Puget Sound. They bring together the experience and viewpoints of citizens, major state and federal natural resource agencies, local governments, non-government organizations and Puget Sound Tribes. The SRFB provides grant funds to protect or restore salmon habitat and assist related activities that produce sustainable and measurable benefits for fish and their habitat. The Shared Strategy process helps identify what is needed in each watershed to recover salmon habitat through a watershed recovery plan.

Shared Strategy

The Shared Strategy is based on the conviction that:
1) People in Puget Sound have the creativity, knowledge, and motivation to find lasting solutions to complex ecological, economic, and cultural challenges;

2) Watershed groups that represent diverse communities are essential to the success of salmon recovery;
3) Effective stewardship occurs only when all levels of government coordinate their efforts;
4) The health and vitality of Puget Sound depends on timely planning for ecosystem health and strong local and regional economies; and
5) The health of salmon are an indicator of the health of our region salmon recovery will benefit both human and natural communities.
The 5-Step Shared Strategy
1) Identify what should be in a recovery plan and assess how current efforts can support the plan.
2) Set recovery targets and ranges for each watershed.
3) Identify actions needed at the watershed level to meet targets.
4) Determine if identified actions add up to recovery. If not, identify needed adjustments.
5) Finalize the plan and actions and commitment necessary for successful implementation.

Salmon Recovery Funding Board

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). SRFB has helped finance over 500 projects. The Board supports salmon recovery by funding habitat protection and restoration projects. It also supports related programs and activities that produce sustainable and measurable benefits for fish and their habitat.

Lead Entities

Lead entities are voluntary organizations under contract with the Washington State Department of Fish and Wildlife (WDFW). Lead entities define their geographic scope and are encouraged to largely match watershed boundaries. Lead entities are essential in ensuring the best projects are proposed to the Board for funding in its annual grant process.

All lead entities have a set of technical experts that assist in development of strategies, and identification and prioritization of projects. The lead entity citizen committee is responsible under state law for developing the final prioritized project list and submitting it to the SRFB for funding consideration. Lead entity technical experts and citizen committees perform important unique and complementary roles. Local technical experts are often the most knowledgeable about watershed, habitat and fish conditions. Their expertise is invaluable to ensure priorities and projects are based on ecological conditions and processes. They also can be the best judges of the technical merits and certainty of project technical success. Citizen committees are critical to ensure that priorities and projects have the necessary community support for success. They are often the best judges of current levels of community interests in salmon recovery and how to increase community support over time with the implementation of habitat projects. The complementary roles of both lead entity technical experts and citizen committees is essential to ensure the best projects are proposed for salmon

recovery and that the projects will increase the technical and community support for an expanded and ever increasing effectiveness of lead entities at the local and regional level. (http://www.iac.wa.gov/srfb/leadentities.htm).

The Lead Entity for the East Kitsap Peninsula and Minter Creek is Kitsap County. East Kitsap's 360 miles of saltwater shorelines account for nearly half of the nearshore habitat in south and central Puget Sound. These areas provide critical habitat for salmon, particularly for juvenile smolts as they migrate from freshwater systems in south and central Puget Sound watersheds to the ocean. Also, culverts, screens and other mostly human-made barriers to spawning and rearing areas are limiting factors to salmon survival. Projects are taking place to eliminate these barriers and to improve the nearshore habitat where appropriate.

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 Minter Creek Hatchery fingerling 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 the freshwater 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 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 adult chinook originating through the program may also serve as prey for large, mammalian predators in marine areas, nearshore marine areas and in Minter Creek to the detriment of population abundance and the program's success in harvest augmentation. 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 (focus is on listed and candidate salmonid species).

- Puget Sound chinook

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 trout and other salmonid species (coho) present in the Minter Creek watershed through natural 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 creek 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 fish. Nutrients provided by decaying chinook carcasses might also benefit fish in freshwater. These species include:

- Northern pikeminnow
- Coho salmon
- Cutthroat trout
- 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.

The water source use for fish rearing at Minter Creek Hatchery is surface water from Minter Creek. Water quality varies greatly with the time of the year and weather. Temperature profiles are monitored. Water quality is improved by the settling of solids from incoming water in the rearing ponds. There is no data on differences in water temperature between the water source and the discharging water of the ponds.

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.

There are no native listed fish in Minter Creek. Chinook are not passed upstream at Minter Creek. At Minter Creek Hatchery, there are two intake structures; a gravity intake with 1.0" x .094" screens, and a pump intake with 4.0" x .156" wedge-wire screens. Although no wild listed species exist above the intakes, the intake screen structures are scheduled for retrofitting, pending available funding. Pond waste is pumped onto the wooded uplands surrounding the hatchery at Coulter Creek (used to rear fish for Tumwater Falls program) and into a formal abatement system at Minter Creek. The hatchery operates under NPDES permit number WAG 13-1024. The water right permit # for Minter Creek is S2-21357.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods)

Broodstock chinook are trapped from July through October at Minter Creek using a barrier dam which directs returning fish into a concrete step ladder ending in a sorter, from which species are separated into any one of 4 holding ponds. Fish may also be returned upstream (e.g., coho salmon and cutthroat) or returned back downstream in some cases. All non-target species trapped through the program are released upstream as soon as practical.

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

Fish are typically hauled in a 300 gallon steel tank. If a larger tank is needed it is borrowed from another facility.

5.3) Broodstock holding and spawning facilities.

At Minter Creek Hatchery, broodstock are held until ripe in concrete raceway-style ponds measuring 20' X 120'.

5.4) Incubation facilities.

All incubation is done in vertical-style incubators using either pathogen free well water or Minter Creek water.

5.5) Rearing facilities.

Fish are reared in any one of several different sized concrete raceway ponds, either the 10' X 100' or more commonly in the 20' X 140' raceways.

5.6) Acclimation/release facilities.

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.

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

There have been no significant fall chinook mortalities. Minter Creek Hatchery uses reuse water for rearing fish, which presents an increased risk of fish disease and elevated mortality in the spring when the rearing densities are high.

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.

The hatchery is staffed full time and has modern water alarm systems that are tested weekly. Fish rearing is conducted in compliance with the co-managers Fish Health Policy (1998). Adherence to artificial propagation, sanitation and disease control practices defined in the policy reduced the risk of fish disease pathogen transfer to listed chinook salmon. Chinook are taken for program needs and none are passed upstream.

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.

Broodstock source is adult chinook returning to the Minter Creek Hatchery. WDFW shall continue to use gametes procured from fall chinook salmon adults volunteering to the Minter Creek Hatchery to affect this program. The intent is to collect localized hatchery-origin broodstock at this location.

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 1990's.

6.2.2) Annual size.

1,400 adults for the core programs. More adults are required if eggs are needed to support the Tumwater Falls or Gorst Creek fingerling chinook programs.

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

Past levels of naturally produced chinook used as broodstock for the program are unknown, but have probably been low. Starting with the 1997 brood, Minter Creek chinook have been mass marked with an adipose fin clip. Since it is an isolated (segregated) program, the intent is to use only hatchery-origin fish for broodstock, and was100% attainable starting in 2003. As there is no natural production above the hatchery, and likely, downstream of the hatchery, it is anticipated that there will be few to no "wild" origin chinook that will be identified through trapping at Minter Creek.

6.2.4) Genetic or ecological differences.

Minter Creek does not have a native chinook salmon population. 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 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.

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. All White River spring chinook returning to the hatchery weir are marked, and the program is operated to exclude these fish from the adult fall chinook population selected as broodstock.

SECTION 7. BROODSTOCK COLLECTION

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

Adults.

7.2) Collection or sampling design.

Fall chinook are trapped in August and September and spawned in September and October. They are trapped by use of an in-stream barrier dam and a stepladder. At Minter Creek Hatchery, all fish directed past the barrier dam enter a sorter prior to entering the holding ponds.

7.3) Identity.

Currently all fall chinook returning to the hatchery can be used for broodstock. Returning hatchery-origin fall chinook are now marked with an adipose-fin clip to allow ready visual identification.

7.4) Proposed number to be collected:

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

1,400 adult fall chinook are needed for the Minter Creek programs. Depending on needs (shortfalls) of other programs, more broodstock may be needed.

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

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1992	819 *none*	900	15	3,715,000	
1993	370 *none*	400	11	1,363,000	
1994	911 *377*	1261 *400*	65 *10*	3,963,000 *1,564,000*	
1995	312 *493*	304 *1565*	0 *24*	1,393,000 *1,851,000*	
1996	89 *695*	77 *700*	2 *20*	380,000 *2,794,000*	
1997	442 *209*	439 *207*	3 *10*	1,570,000 *786,000*	
1998	1588 *164*	1430 *100*	25 *0*	6,472,000 *624,000*	

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1999	704 *232*	540 *180*	6 *0*	2,988,000 *980,000*	
2000	980	908	9	4,660,000	
2001	619	629	8	2,667,700	
2002	482	486	1	2,439,600	
2003	520	543	3	2,680,700	

NOTE: Upper figures are for Minter Creek Hatchery
Lower figures are for Coulter Creek Hatchery

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

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).
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.

Juvenile chinook salmon releases at Coulter Creek were discontinued in 2001. Remaining adult hatchery-origin fall chinook salmon adults resulting from past on-station releases returning to Coulter Creek over the next five years will be allowed to spawn naturally. The expectation is that these returns will not create a self-sustaining natural population because Coulter Creek lacks essential habitat features needed by chinook salmon. The Coulter Creek trap will not be operated to remove fall chinook adults unless returns to Minter Creek Hatchery are insufficient to meet the station's programmed egg take need).

7.6) Fish transportation and holding methods.

Adult fall chinook are held to maturity for 1-3 weeks in the sorting ponds and spawned on site. There is no need to transport adults.

7.7) Describe fish health maintenance and sanitation procedures applied.

Fish health measures are consistent with the Co-Manager's Disease Policy (NWIFC and WDFW 1998).

Portions of the returnees are ELISA sampled for Bacterial Kidney Disease antibody titers. Up to 200,000-eyed eggs from "below-low" titer adults are reserved for the Gorst Creek yearling chinook program, as a means of controlling BKD outbreaks in the yearling program.

7.8) Disposition of carcasses.

Spawned and unspawned carcasses are usually sold on contract. There are a few pre-spawning mortalities which 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.

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 risk of fish disease amplification and transfer to natural-origin chinook salmon will be minimized by following the Co-Manager's Disease Policy. No listed natural-origin fish will be knowingly spawned (all broodstock to be collected are identifiable by an adipose-fin clip) and no chinook are passed upstream. At least 500 broodstock will be collected throughout the entire run time from adults arriving at the rack to maintain integrity and genetic diversity. For the past three years, WDFW has been adjusting the run timing to historical dates for the fall chinook to better separate between the timing of its return and that of the White River spring chinook stock.

SECTION 8. MATING

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

8.1) Selection method.

All ripe fish of hatchery origin are spawned until program goals are met. There is no selection for any age class, morphological or behavioral traits, including adult return timing. All selection is random.

8.2) Males.

Males are randomly selected for spawning. Jacks (2 year old male chinook) are used at a 2% rate, consistent with the proportion of jacks in the total annual return.

8.3) Fertilization.

Sperm is pooled in 5 fish lots and added to the pooled eggs of five females.

8.4) Cryopreserved gametes.

None 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.

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).

To minimize the risk of genetic diversity loss within the propagated population, measures are applied during spawning to help ensure that the effective breeding population is equivalent to the number of adult fish collected for spawning. Mating cohorts are randomly selected. Beginning with the 2003 returns, all broodstock (minimum of 500) used in the mating scheme will be identifiable by a adipose-fin clip.

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:

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

Number of eggs taken by year at Minter Creek are:

Year	Eggs	Survival Rate to Eye Up	Survival Rate to Ponding
1990	3,665,000	Unknown	Unknown
1991	4,126,000	Unknown	Unknown
1992	3,715,000	85.0%	Unknown
1993	1,363,000	87.9%	85.0%
1994	3,963,000	93.4%	91.9%
1995	1,393,000	90.3%	88.9%
1996	380,000	92.9%	90%
1997	1,570,000	94.9%	86.3%
1998	6,472,000	95.7%	93.7%
1999	2,988,000	93.6%	90.2%

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

Egg takes are currently being managed to minimize the potential for surplus eggs. The current policy is to release excess fall chinook fry into landlocked lakes in order to minimize affects on ESA-listed salmonid populations.

9.1.3) Loading densities applied during incubation.

Egg size varies from 1500 eggs per pound (/lb) to 1,150 eggs/lb. Incubator flows are 4 to 4.5 gallons per minute (gpm). The number of eggs per tray is between 6,000 and 8,000.

9.1.4) Incubation conditions.

At Minter Creek hatchery, the silt loads in the incubators are monitored and the incubators are cleaned as needed. Most of station's incubation is done with well water that is a constant 49 degrees Fahrenheit. Some surface water is used when needed

9.1.5) Ponding.

Fry are usually force ponded in late December through January based on visual inspection of the fish. It is difficult to monitor and determine accumulated temperature units (TU's) and, therefore, fish developmental stages to indicate the appropriate time to pond fry. Temperature differences between creek water and well water, interchangeably used for incubation, complicate the ability to calculate accumulated TU's.

9.1.6) Fish health maintenance and monitoring.

Fungus is controlled with a formalin drip treatment. Egg mortality is removed using a mechanical picker when eggs reach the eyed stage.

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.

Minter Creek Hatchery fall chinook and White River spring chinook are incubated in separate, isolated, incubation rooms to minimize the risk of inter-stock disease transmission during this stage. Dead eggs are discarded in a manner that prevents disease transmission. Beginning with the 2003 returns, all eggs being incubated will be from adults identifiable by an adipose-fin clip.

9.2) <u>Rearing</u>:

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

For Minter Creek:
Green egg to fry Goal = 90% Range = 85.3 to 94.3% Average = 89.6%
Fry to Smolt Goal = 90% Range = 93.6 to 98.3% Average = 95.7%

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

At the time of release, fish are reared at or below a density of 5 pounds per gallon per minute (lbs/gal/min.) of flow.

9.2.3) Fish rearing conditions

Weight samples are taken weekly and pond loadings are monitored. Dissolved oxygen readings are taken as needed. Flow rates, oxygen concentrations and fish densities are maintained at levels that ensure the production of healthy fish.

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.

Not available.

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*).

Either Bio Moist or Bio Diet is fed one to six times per day at rate of 2.0% to 2.5% body weight /day. Feed is metered to the fish to ensure that daily levels are below 0.1-lbs/gal/min inflow.

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

Fish health is monitored continuously by on-site hatchery staff, and periodically by a WDFW fish health specialist. Treatments for disease pathogens, if needed, are prescribed by the fish health specialist (Co-managers Fish Health Policy 1998). Ponds are cleaned weekly as an appropriate sanitation measure to reduce the likelihood of fish disease out-breaks.

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

Gill ATPase activity is not monitored. 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.

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.

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).

Only fish of known non-listed hatchery origin are propagated through the program. Fish will be reared to fingerling smolt size to mimic typical Puget Sound natural fall chinook fish out-migration strategies and to minimize the risk of domestication effects. Guidelines are followed for rearing (Piper et al. 1982) and fish health parameters (Co-managers Fish Health Policy 1998).

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

The Minter Creek fall chinook release goal is 1.8 million fingerling smolts released in May at 80 fpp. A sub-sample of the fish population is weighed and measured each year prior to release to estimate fish size variation within the population. The goal of the rearing program is to attain a coefficient of variation for weight/length within the population of 10.0 or less in order to ensure that the population is of uniform size at the time of release, and that the majority of fish are released as seaward migrating smolts.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling	1,800,000	80	May	Minter Creek
Yearling				

Note: Fish averaging 80 fpp in weight may be estimated to average ~ 80 mm in fork length.

Minter Creek, via Coulter Creek, supports the early rearing portion of the Tumwater Falls fingerling chinook program. 1.8 million at ~150 fish per pound are shipped to Tumwater Falls in April and an additional 1 million are shipped, in two lots, in May. Eggs are taken for the Gorst Creek WDFW / Suquamish yearling program, if needed.

In addition to the fingerling smolt program, the hatchery transfers eggs to Manchester for no release.

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

Stream, river, or watercourse: Minter Creek (15.0048)
Release point: Minter Creek, RM 0.5
Major watershed: Minter Creek, Carr Inlet
Basin or Region: Puget Sound

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

Minter Creek:

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1992					2,007,000	100		
1993					1,096,000	80	35,000	10
1994					1,117,500	80		
1995					2,073,000	80		
1996	227,000	950			1,924,300	80		
1997	414,000	1,000			1,919,800	80	51,500	4

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1998					2,069,000	74	77,800	6
1999	25,748	990			2,066,000	73		
2000					1,975,600	74		
2001					1,844,650	75		
2002					1,892,500	74		
2003	359,687	985			1,876,675	73		
Average	256,609	981			1,821,835	72	54,767	7

Note: Yearling releases are no longer part of the Minter Creek fall chinook program.

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

Release date ranges for Minter Creek releases on station; 1995-1999

Year	Life Stage	Start Date	End Date
1995	Fingerling Smolt	May 16	May 24
1996	Unfed Fry	January 18	January 18
	Fingerling Smolt	April 11	April 11
	Fingerling Smolt	May 10	May 10
1997	Unfed Fry	January 27	January 27
	Fingerling Smolt	May 8	May 8
	Yearling	June 3	June 3
1998	Fingerling Smolt	April 30	April 30
	Yearling	May 16	May 16
1999	Unfed Fry	January 20	January 20
	Fingerling Smolt	May 3	May 10

Minter Creek chinook are generally released the first part of May when they exhibit strong migratory behavior and the tides are good for release. They are released in the evening on the start of an incoming tide. They are forced out of the ponds.

10.5) Fish transportation procedures, if applicable.

Support program for Tumwater Falls chinook program. Fry are transported to Tumwater Falls in fish tankers with recirculation, oxygenated water.

10.6) Acclimation procedures.

All fish are acclimated on creek water from ponding to release.

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

Proportion of releases of chinook from Minter Creek that are coded-wire tagged and/or adipose-fin clipped.

Minter Creek:

1998	2,066,000 fingerlings	AD Only
1999	1,975,600 fingerlings	AD Only

WDFW continues to mass mark (adipose-fin clip only) 100% of the fall chinook salmon fingerlings released through the hatchery program to allow monitoring and evaluation of the hatchery program fish releases and adult returns. Beginning with the 2002 broodyear, WDFW adipose-fin clipped/coded-wire tagged (CWT'd) 200,000 of the fingerling fall chinook production (1.6 million mass marked) at the facility to allow for evaluation of fishery contribution, survival rates and straying levels to other Puget Sound watersheds.

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.

A WDFW Fish Health Specialist prior to release or transfer, in accordance with the Co-Managers Salmonid Disease Policy, examines each lot of fish.

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

In the event of a water system failure, screens would be pulled to allow fish to exit the pond. In some cases they can be transferred into other rearing vessels to prevent an emergency release. During severe drought conditions, fish may be released early to prevent 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.

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).
Chinook are released from Minter Creek Hatchery as fingerling smolts at RM 0.5, generally around the first of May. Releasing zero age smolts fosters rapid migration to salt water and thus reduces the likelihood of hatchery fish preying on or competing with wild salmonids (see section 2.2.3).

In addition, a rearing parameter of the sub-yearling program is to attain a coefficient of variation (CV) for length of 10.0% or less in order to ensure that the population is of uniform size at the time of release, and that the majority of fish are released as seaward migrating smolts (Fuss and Ashbrook 1995). Such fish would be less likely to residualize in fresh water and interact with listed wild fish. The average CV for release years' 1999, 2001 and 2002 was 6.85%.

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 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 will also monitor straying of hatchery chinook salmon to other Puget Sound watersheds through mark recovery programs conducted during spawning ground surveys and sampling at other Puget Sound hatcheries.

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

With the advent of mass marking, this will allow for identification of all hatchery fall chinook production in the watershed and help monitor NOR/HOR spawning ground ratios in this watershed below the hatchery and in adjacent streams and creeks.

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 as detailed in the Resource Management Plan for Puget Sound Chinook Salmon Hatcheries (Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, August 23, 2002).

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.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

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

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

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).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

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.

SECTION 13. ATTACHMENTS AND CITATIONS

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SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the foregoing information 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:_____

Take Table. Estimated listed salmonid take levels by hatchery activity.

Chinook

ESU/Population	Puget Sound Chinook *(Oncorhynchus tshawytscha)*-
Activity	Minter Creek Chinook Fingerling Program
Location of hatchery activity	Minter Creek Hatchery, RM 0.5Minter Creek (15.0048)
Dates of activity	August- June
Hatchery Program Operator	WDFW

Type of Take	Annual Take of Listed Fish by life Stage (number of fish)			
	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 (indirect, unintentional) (h)	-	Unknown	-	-

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.