U.S. Fish & Wildlife Service

Quilcene National Fish Hatchery

Comprehensive Hatchery Management Plan

February 2007

COMPREHENSIVE HATCHERY MANAGEMENT PLAN

Quilcene National Fish Hatchery

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Explanation of Purpose

Quilcene National Fish Hatchery – Comprehensive Hatchery Management Plan

This Comprehensive Hatchery Management Plan (CHMP) for the Quilcene National Fish Hatchery (NFH) is an operational management plan which outlines policies, legal mandates, goals and objectives relevant to the overall management of the station. This document is a planning and reference tool and is not a decision-making or policy-making document.

Additional documents developed in separate processes are referenced in this CHMP and provide biological, policy, legal, and management analysis of the Quilcene NFH. These documents include the Hood Canal Salmon Management Plan and Hatchery Genetic Management Plan.

The correct citation for this plan is:

U.S. Fish and Wildlife Service (USFWS). 2007. Comprehensive Hatchery Management Plan for the Quilcene National Fish Hatchery. U.S. Fish and Wildlife Service, Quilcene National Fish Hatchery, Quilcene, Washington.

This Comprehensive Hatchery Management Plan for the Quilcene National Fish Hatchery addresses the Pacific Region's requirement to integrate U.S. Fish and Wildlife Service objectives and priorities with those of co-managers, other agencies, and resource programs; fulfill obligations under the Endangered Species Act and relevant fisheries conservation, mitigation, and management programs; identify and define in specifics what hatchery reforms are implemented to achieve objectives; and provide a foundation for future program and budget development and review.

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Executive Summary

Plan Overview

The U.S. Fish and Wildlife Service (Service) has recognized the need for a comprehensive hatchery planning process to assist in meeting the challenge of changes to hatchery management required by the conservation status of most Pacific salmon and other anadromous and freshwater fish species. The development of plans such as this one will help to: 1) integrate Service objectives and priorities with those of co-managers, other agencies, and resource programs; 2) fulfill our obligations under the Endangered Species Act and relevant fisheries conservation, mitigation, and management programs; 3) identify and define in specifics what hatchery reforms we are implementing to achieve our objectives; and 4) provide a foundation for future program and budget development and review.

Hatchery Purpose

Quilcene NFH was authorized by 35 Stat. 589 on June 29, 1909. This statute authorized the Secretary of Commerce and Labor to establish "two or more fish cultural stations on Puget Sound, or its tributaries in the State of Washington, for the propagation of salmon and other food fishes." The station was constructed in 1911 at a cost of $16,700. The Act contains no specific language concerning the species the station was to rear or the specific waters to be stocked by the hatchery. We currently propagate coho salmon only.

Hatchery Goals

Goal 1: Support recovery and conservation of local endangered and threatened species as well as species at risk.

Goal 2: Assure that hatchery operations support the Hood Canal Salmon Management Plan, the Puget Sound Salmon Management Plan (*U.S. v Washington*), and Pacific Salmon Treaty objectives.

Goal 3: Promote understanding, participation, and support of Service and Quilcene NFH programs.

Goal 4: Support the principles of hatchery reform.

Hatchery Benefits

Harvest contribution - Smolts from the on-station release have contributed an annual average of 17,693 adults to fisheries and 7,778 to the hatchery. Fisheries include both commercial and sport and range from Canada to the Big Quilcene River.

Economic benefit - Significant economic activity is realized as a result of Quilcene NFH releases that contribute to all-citizens sport and commercial fisheries in Canada, Washington coast, Strait of Juan de Fuca, Hood Canal, Dabob Bay, Quilcene Bay, and the Big Quilcene River. The commercial fishery for coho salmon in Quilcene Bay is predominantly a tribal fishery. Fisheries in the Big Quilcene River include an all-citizens sport fishery and tribal subsistence and commercial fisheries. Excess adults to the hatchery rack support local tribal subsistence programs and the federal prison food system.

Planning Issues

Several federal, state, and tribal entities share responsibilities for development of hatchery production, harvest management, and Endangered Species Act (ESA) compliance plans in the geographic area of the Quilcene NFH. We strive to comply with all fishery management plans and agreements affecting Hood Canal in Washington State.

Hatchery reform - The Hatchery Reform Project resulted in hatchery specific as well as area-wide recommendations regarding fish hatcheries. These recommendations were developed by an independent scientist panel with informational input from various agency personnel.

Recommendations specific to Quilcene included increasing the percentage of jack coho spawned, reducing coho production, eliminating chum production, and continuing mass marking. We have implemented all of these recommendations. However, an additional recommendation was made to replace existing Quilcene coho stock with Big Beef Creek stock to alleviate perceived genetic impacts to neighboring wild coho stocks. The USFWS and co-managers are conducting a genetic profiling study to identify an appropriate stock if replacement is deemed necessary.

Marking - The FY 2003 appropriations language (House bill, Conference Committee and Omnibus Appropriations) requires the Service Ato implement a system of mass marking of salmonid stocks released from federally operated or federally financed hatcheries including but not limited to fish releases of the coho, Chinook, and steelhead species." Mass marking to facilitate selective fisheries was implemented at Quilcene in 1998 and is on-going.

Juvenile salmon distribution and production numbers - Release strategies are employed that promote rapid downstream migration from the hatchery. Production is sized to station capacity regarding rearing environment and subsequent fish health.

Instream Flow - Washington State's 1998 Watershed Planning Act, known as "2514" after the number of the state legislative bill that created it, made funding available for local citizen groups to assess the health of local watersheds. Inherent in this process is development of instream flow recommendations that are directed at identifying the flow at which more water could be appropriated for human uses. The Big Quilcene River lies within Water Resource Inventory Area (WRIA) 17 and like all other area streams has probably reached its maximum appropriation potential without further impacts to fishery resources. The Service is participating in the WRIA 17 planning process as a member of the technical team to help ensure that Quilcene NFH's interests in water allocation are considered.

Water shortage (drought) - We developed options regarding fish releases commensurate with expected declines in water availability for fish culture. The options range from the preferred option of an early on-station release of some production to less acceptable options such as releases into other watersheds or euthanasia.

Surplus adult salmon distribution - Surplus and spawned carcasses are distributed via agreement with the Bureau of Indian Affairs to local tribes primarily. A secondary agreement with the Department of Justice is in place to provide a food source to the prison system after the primary agreement needs are met.

Fish passage and ladder management - Generally, adult fish passage is controlled manually to seed suitable and accessible habitats above the hatchery. Repairs to the existing weir bypass ladder are needed to minimize manual handling and facilitate the upstream passage goal.

Penny Creek impasse - Two structures on hatchery property were identified as complete year-round barriers to both juvenile and adult fish movement. A feasibility study has been proposed through the FONS process to assess the risks and benefits of allowing fish access and to assess necessary infrastructure alternatives.

Actions to Help Recover Listed and Depressed Populations

Coho releases are designed to produce functional smolts that outmigrate rapidly, thus reducing the risk of interactions with juvenile summer chum and Chinook salmon.

A summer chum restoration program was conducted from 1992-2003 using the Quilcene NFH for propagation. The program was successful in increasing adult returns to a current average of 9,000 fish in the Big Quilcene River and in re-establishing a run at Big Beef Creek.

Funding

Quilcene NFH receives all funding for operations and maintenance from the Service.

CHAPTER 1. INTRODUCTION/BACKGROUND

1.1 Purpose of and Need for Plan

The Quilcene National Fish Hatchery (NFH) was placed in operation in 1911 with the intent of propagating salmon and other food fishes in Puget Sound or its tributaries in the State of Washington. Over the years, the Quilcene NFH production program has included a variety of fish species: Coho salmon (*Oncorhynchus kisutch)*, fall Chinook salmon and spring Chinook salmon (*O. tshawytscha*), fall chum salmon and summer chum salmon (*O. keta*), sockeye salmon and kokanee (*O. nerka*), pink salmon (*O. gorbuscha*), winter steelhead and rainbow trout (*O. mykiss*), brook trout (*Salvelinus malma*), cutthroat trout (*O. clarki*), and Montana blackspot trout (cutthroat) (*O. clarki*). Coho and chum salmon adapted well to the Quilcene NFH environment and the resulting programs emerged as successes. In the past, hatchery programs were allowed to evolve based on perceived needs and capabilities of the facility. Today's hatchery programs are dynamic and the origin of change is driven by public appeal, legislative mandates, judicial decrees, and the Endangered Species Act. The need to develop thoughtful planning processes based on sound policy and scientific information has never been greater.

The U.S. Fish and Wildlife Service (Service) has recognized the need for a comprehensive hatchery planning process to assist in meeting the challenge of changes to hatchery management required by the conservation status of most Pacific salmon and other anadromous and freshwater fish species. The development of plans such as this one will help to: 1) integrate Service objectives and priorities with those of co-managers, other agencies, and resource programs; 2) fulfill our obligations under the Endangered Species Act and relevant fisheries conservation, mitigation, and management programs; 3) identify and define in specifics what hatchery reforms we are implementing to achieve our objectives; and 4) provide a foundation for future program and budget development and review.

The Service is committed to developing and maintaining a sound scientific and management underpinning for its programs. We have participated with State, Tribal, and Federal partners in reviewing and assessing hatchery operations as they evolve to become, more than ever, part of the solution to fisheries restoration and recovery goals. We have involved our cooperators in defining and evaluating our respective roles and we continue to aggressively reach out to the general public, individual constituent groups, and local governments to explain our programs and initiatives. We have put in place a system of program evaluation and utilize principles of adaptive management to integrate new information and expectations. All this and more is embodied in the development of this plan. The journey of developing these plans, the research, analysis, thought, and outreach is as important as the product itself. We look to this process to stabilize and strengthen Service fish production programs in fisheries restoration and recovery efforts of the Nation.

1.2 Description of Planning Process

Development of the Quilcene CHMP is a collaborative process involving individuals from multiple disciplines within the Service. The planning process began in February 2001 (Diggs 2001) with establishment of the Quilcene CHMP Team, the core group responsible for drafting and revising the CHMP. The Team is composed of Service staff. Each Team member has professional knowledge of Quilcene NFH operations, ranging from on-site facility management to fish health and related hatchery evaluation and harvest management processes affecting the hatchery. Team members were drawn from the Quilcene Hatchery Evaluation Team (HET).

1.3 Composition of Planning Team

The planning team consisted of Service representatives from the following stations:

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1.4 Review and Update of Plan

Because the biological, sociological, economic, and political environment is constantly changing; the role and responsibilities of Quilcene NFH can also be expected to change. It is intended that the CHMP would be dynamic to reflect that nature. Therefore, it was necessary to include a process for reviewing and updating the plan on a periodic basis. The HET will review and update the CHMP and the associated step-down plan as hatchery programs and operational changes occur.

1.5 Fisheries Program Mission, Goals, and Priorities

Our National Fish Hatcheries in the Pacific Region of the Service (Figure 1) have authority for construction, operation, and maintenance that is contained in a variety of specific and general statutes. The remainder of the Fisheries Program is guided by a variety of general statutory mandates and authorities. Without the specific direction that would come from organic legislation, the Service has continually adjusted the priorities of the entire Fisheries Program at the national level to guide the Program and ensure that each Region within the Service is focusing their limited resources on the highest priorities of the Nation.

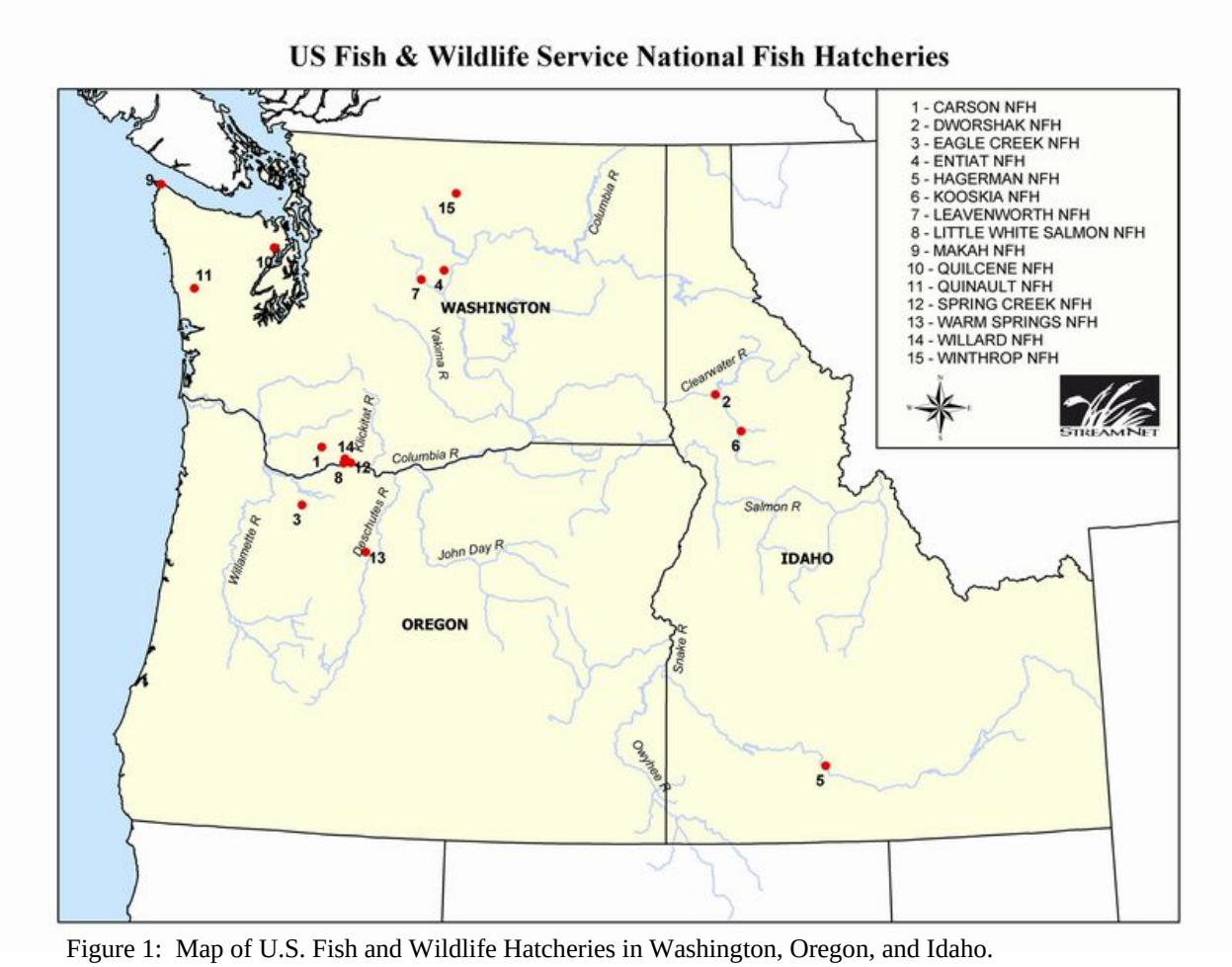

Figure 1: Map of U.S. Fish and Wildlife Hatcheries in Washington, Oregon, and Idaho.

To provide long-term management direction for fishery resources, the Service developed a series of planning documents. In January 1985 the Service issued a description of priorities for the Fisheries Program in a document entitled "Statement of Responsibilities & Role." In May 1994, to incorporate those priorities within an ecosystem approach, the Service combined the fisheries resources and aquatic priorities of the Fisheries, Ecological Services, and Refuges Programs into a single document titled, "Action Plan for Fishery Resource and Aquatic Ecosystems." This document included a comprehensive ecosystem and watershed based conservation, restoration,

and enhancement program. As the Fisheries Program further evolved to include a conservation perspective to the management of natural populations, a further revision to the Fisheries Program's priorities occurred in 1997, with six priorities:

- Recovery of listed and candidate aquatic species
- Restoring depleted aquatic populations to preclude listing
- Management of inter-jurisdictional fisheries
- Restoration of inter-jurisdictional fisheries and aquatic ecosystems
- Fulfilling mitigation obligations
- Providing fish and wildlife management assistance to tribes and on Service lands

At the request of Congress and the Office of Management and Budget, the Service began development of a strategic plan for the National Fish Hatchery System in 2000. In 2001 the Service then began preparation of a strategic plan for the entire Fisheries Program. This plan was completed in cooperation with the Sport Fishing and Boating Partnership Council in 2002. This strategic plan (USFWS 2002) contains seven focus areas:

- Partnerships and Accountability
- Aquatic Species Conservation and Management
- Public Use
- Cooperation with Native Americans
- Leadership in Science and Technology
- Aquatic Habitat Conservation and Management
- Workforce Management

These seven focus areas were used to develop a step-down plan for the Pacific Region's Fisheries Program. This strategic plan was released in 2004 (USFWS 2004), and contains more than 100 specific goals and objectives for the planning period 2004-2008, keyed to the Service's seven focus areas.

1.6 National Fish Hatchery System - Overview and Statutory Mandates/Authorities

The Service's stewardship of the Nation's varied and valuable fishery resources dates from the appointment of Spencer Baird as Commissioner of Fish and Fisheries by President Ulysses S. Grant in 1871. That initial Federal involvement was in response to concern over the widespread decline in domestic food fish supplies. In 1872, Congress provided the first appropriation for the Fishery Program when it funded the introduction of shad, salmon, whitefish, and other food fishes into waters to which they were best adapted. Later that year "The propriety was strongly urged, at the Boston meeting, of sending some experienced fish-culturist to the west coast for the purpose of securing a large amount of spawn of the California salmon." Mr. Livingston Stone traveled to California and established a hatching-works on the McCloud River. This was the first salmon breeding unit in the United States, the first hatchery to be established with Federal funds, and the beginning of the National Fish Hatchery System.

During the early years of the hatchery program, most NFHs were established under general authorizations for fisheries development as specified in appropriation acts. Then in the 1930s a series of acts provided authorizations for hatchery development. This permitted the National Fish Hatchery System to expand on a planned basis. Each of these acts (White Act in 1930, Fish and Wildlife Coordination Act in 1934, and the Mitchell Act in 1938) contained limitations which prevented their use as general authorizing statutes applicable for hatchery construction in other areas of the country.

The Service has a 135 year history of leading Federal fishery conservation efforts in the Pacific Northwest. During this time, our Federal fishery resource involvement and responsibilities have grown, diversified, and undergone several modifications in response to continually changing needs. The program shifts and expansions evolved to address the circumstances of each era. Today, the Service is taking a holistic approach to fishery conservation. Present activities focus on a broad array of scientific fishery management and conservation efforts.

Attachment 1 provides a historical background into the establishment and operation of National Fish Hatcheries in Region 1. (Historically, Region 1 included Washington, Oregon, Idaho, California, Nevada, Hawaii and the Pacific Territories. Currently, California and Nevada are organized under the separated California/Nevada Office) Since the establishment of the first salmon hatchery on the McCloud River, 67 hatcheries or fish facilities have been established in California, Nevada, Idaho, Oregon, and Washington. Only 19 of those hatcheries, two fish facilities, and one technology center are in operation today. The remainder have either been closed or transferred to State or other Federal agencies.

Attachment 2 documents the development of a broad range of statutory mandates and authorities under which the Service conducts its hatchery program and numerous other fishery-related activities in cooperation with other Federal, State, Tribal, and private entities. Vested with significant legal responsibilities under State and international agreements and treaties and laws, the Service conducts an extensive conservation effort in order to help protect and restore native aquatic species and their habitats with the goal of preempting severe declines and potential listings under the Endangered Species Act.

The Region 1 Fisheries Program consists of four major program activities: National Fish Hatcheries, Fish Health Centers, Technology Centers, and Fishery Resource Offices/Fish and Wildlife Offices. Successful implementation of the Service's hatchery activities requires close coordination and cooperation with the other three Fisheries Program activities. The Abernathy Fish Technology Center provides state-of-the-art applied research in several fields including development of new fish diets for salmonid and sturgeon culture, use of genetic identification in the recovery and restoration of native stocks, and development of new and improved techniques to increase the efficiency of fish culture and captive brood stock operations. Fish Health Centers participate in Investigational New Animal Drug registration, provide diagnostic and veterinarian services on wild fish stocks and hatchery-reared fish, and supply health certifications for the export of fish and fish eggs. Fishery Resource Offices/Fish and Wildlife Offices participate in a

wide variety of activities including coast-wide stock assessment and evaluation, coded-wire tagging of hatchery indicator stocks for the U.S./Canada Treaty, evaluation of hatchery production, and assessment of new approaches to produce "wild type" fish at culture facilities. These offices also participate in a broad range of other activities including habitat restoration, non-indigenous species coordination, and endangered species listing and recovery activities.

1.7 Regional Fishery Goals and Priorities

The Pacific Region Fisheries Program is committed to focusing its priorities and resources toward the conservation, recovery, and restoration of native resident and inter-jurisdictional species. The Fisheries Program works with State, Federal, Tribal, and other partners, as well as on Service, Tribal, and other Federal lands, to ensure that its actions purposefully contribute to these objectives. Regional priorities are as follows:

1.7.1 Implementing Hatchery Reform - National Fish Hatcheries are evaluating hatchery practices so they conform to their associated scientific foundations and management evaluations of those efforts. National Fish Hatcheries in the Pacific Region produce and release fish, and stocks of fish, as identified in approved Hatchery Genetic Management Plans (HGMPs).

1.7.2 Implementing Comprehensive Hatchery Management Plans - Implementation of the CHMP is a Regional priority. Comprehensive plans incorporate the rationale, authorities, and supportive documentation for operation and management of National Fish Hatchery programs.

1.7.3 Hatchery Evaluations - Monitoring and evaluations of hatchery production programs are being addressed in HGMPs and are conducted to assure quality. This is a critical component of effective hatchery operations.

1.7.4 Hatchery Evaluation Teams - To foster and enhance communication in the hatchery evaluation process, active participation in Hatchery Evaluation Teams and related committees by Service programs, resource agencies, and public partners is a Fisheries Program priority.

1.7.5 Habitat Restoration and Technical Assistance to Other Regional Programs - Providing technical assistance to other Regional programs on Service lands with Partners for Fish and Wildlife and other Service habitat restoration efforts is a high priority of the Fisheries Program.

1.7.6 Tribal and Federal Lands - Providing support to Tribal Governments and Federal land management agencies for fish and wildlife resources on their lands has always been and continues to be a high priority.

1.7.7 Fish Passage Improvement - An important part of the Fisheries Program is habitat restoration which re-establishes access to important historic habitats for fish. As such, emphasis is placed on fish passage improvement. A high priority is given to identifying and correcting fish passage problems on National Fish Hatcheries.

1.7.8 Endangered Species Act - The Fisheries Program promotes and initiates actions that ensure all Fisheries Stations in the Pacific Region are in compliance with the Endangered Species Act. Implementing recovery actions and promoting species conservation are high priorities.

1.7.9 Compliance With Court Agreements and Other Legal Obligations - The Fisheries Program complies with court agreements and other legal obligations and enhancement efforts that contribute to the mitigation, conservation, recovery, and restoration of listed, candidate and imperiled fish species, both anadromous native fish and resident native fish, such as bull trout, cutthroat trout, desert fishes, and others.

1.7.10 Mitigation - The Fisheries Program implements artificial production to comply with mitigation mandates consistent with Congressional funding.

1.7.11 Restoration and Recovery of Native Fishes - Restoration and recovery of native fishes is a Regional priority. Healthy stocks of native fish are indicators of clean water and healthy aquatic ecosystems. Healthy stocks of native fish also provide harvest opportunities for recreational, commercial, and tribal fishers.

1.7.12 Ecosystem Approach and Cross-program Coordination - The Fisheries Program continues to work within an ecosystem and cross-program approach using the collective expertise of our employees and programs in a coordinated fashion.

1.7.13 Make Full Use of Computer and Database Technology - It is an ongoing Regional priority to strengthen our staff capabilities and make full use of computer and database technology in order to increase program effectiveness and efficiency, and meet the needs of resource management agencies, tribes, and other Federal agencies.

1.7.14 Outreach - Educational and outreach opportunities are pursued to enhance public understanding of program responsibilities, capabilities, and accomplishments, and will continue to be an important component of the Fisheries Program.

1.8 Legal and Policy Guidance

National Fish Hatchery programs in western Washington are shaped by various policies, regulations, laws, agreements, and legislative mandates. NFH managers and policy makers are constantly challenged with the complex task of implementing a comprehensive state-of-the-art hatchery program while complying with often conflicting legal, regulatory, and legislative mandates. The complexity of implementing a comprehensive hatchery management strategy is further exacerbated by changes that are directed by case-law-based court orders and agreements that may occur on an annual basis. A more detailed discussion of legal justification and operational guidance regarding the Quilcene NFH program is contained in Chapters 2, 3, and 5.

CHAPTER 2. HATCHERY AND RESOURCE DESCRIPTIONS

2.1 Hatchery Overview

Quilcene NFH is in northwestern Washington State, at the confluence of the Big Quilcene River and Penny Creek, on the east side of the Olympic Peninsula in Jefferson County (Figure 2). Quilcene NFH has been operated continuously since 1911 by the Service and its predecessor agency, the Bureau of Fisheries. The hatchery is located along U.S. Highway 101, 2 miles south of the town of Quilcene and 75 miles northwest of Olympia, Washington. The hatchery facilities lie in a narrow valley approximately three miles upstream from Quilcene Bay, an arm of Hood Canal. The valley runs southwest to northeast in the foothills of the Olympic Mountains.

The Walcott Slough Trapping Facility, the station's satellite facility for capturing and spawning chum salmon, is located 10 miles south of Quilcene NFH adjacent to U.S. Highway 101 on Brinnon Flats near the confluence of the Dosewallips River and Dabob Bay. The facility is used only intermittently at this time. Another satellite station was operated on the Duckabush River, and weirs and traps were operated annually on the Dosewallips and Little Quilcene Rivers to capture adult salmon until 1942.

2.2 Hatchery Purpose

Quilcene NFH was authorized by 35 Stat. 589 on June 29, 1909. This statute authorized the Secretary of Commerce and Labor to establish "two or more fish cultural stations on Puget Sound, or its tributaries in the State of Washington, for the propagation of salmon and other food fishes." The station was constructed in 1911 at a cost of $16, 700. The Act contains no specific language concerning the species the station was to rear or the specific waters to be stocked by the hatchery. We currently propagate coho salmon only. Hatchery operations are conducted as an element of the Hood Canal Salmon Management Plan, which is a part of the Puget Sound Salmon Management Plan, resulting from *U.S. v. Washington* (the Boldt Decision).

2.3 Facility and Site Descriptions

The Quilcene NFH occupies approximately 47.4 acres. Its main facilities consist of 39 8-foot x 80-foot raceways, three water intake structures (two on the Big Quilcene River and one on Penny Creek), a pre-settling pond, a pollution abatement pond, a hatchery building (containing the office, laboratory, and tank room), an isolation/quarantine building, and a shop building, all of which are located on the west bank of the Big Quilcene River at RM 2.8. One residence, a small cabin, and a log house are on the hatchery grounds proper, and two other residences for hatchery staff are situated on a hill just north of the hatchery. The hatchery diverts returning adult salmon to holding facilities by means of a graduated-field electrical weir and fish ladder at RM 2.8. Figure 3 shows the principal features of Quilcene NFH.

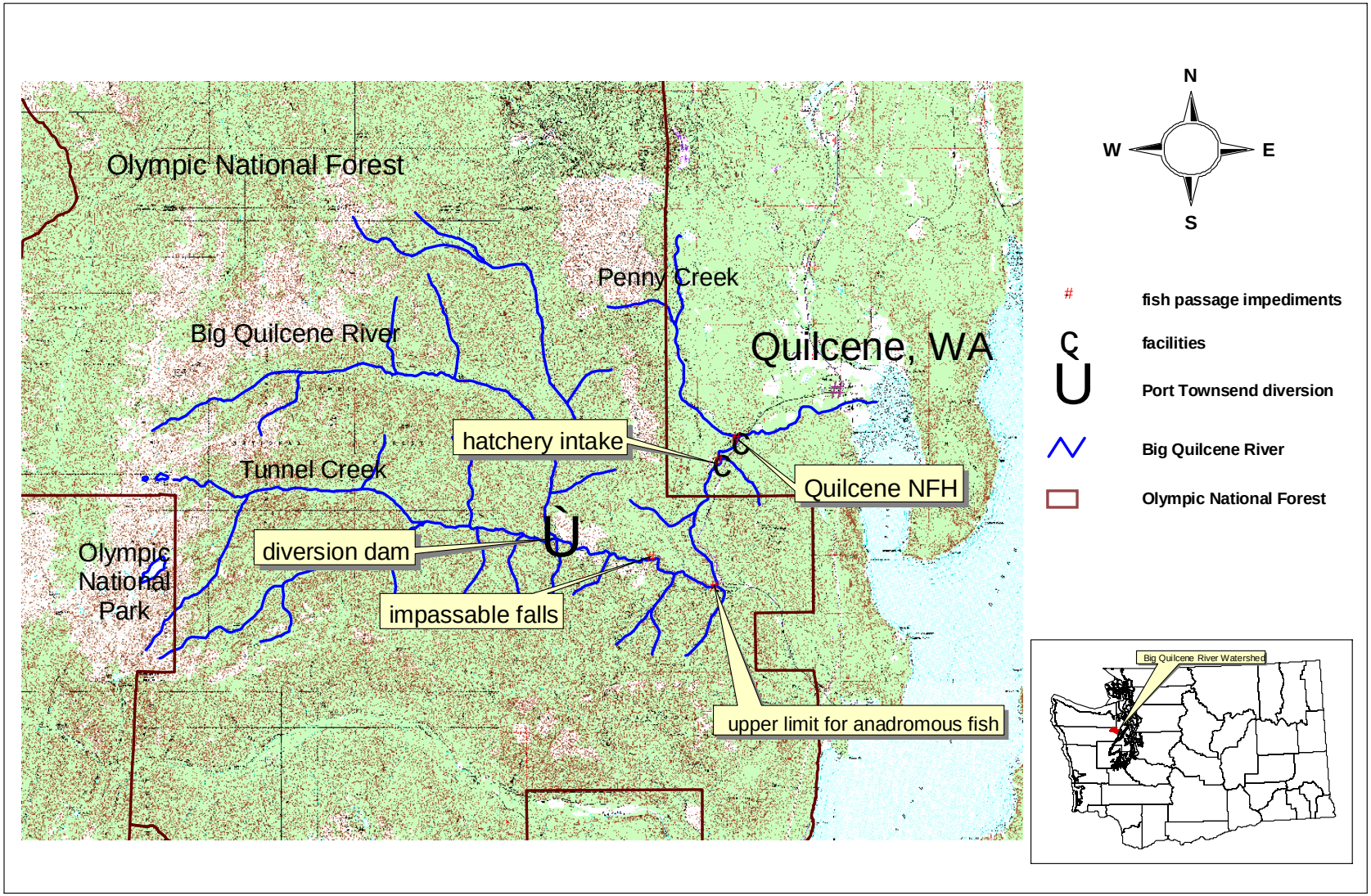

Figure 2. Quilcene NFH and Big Quilcene River watershed.

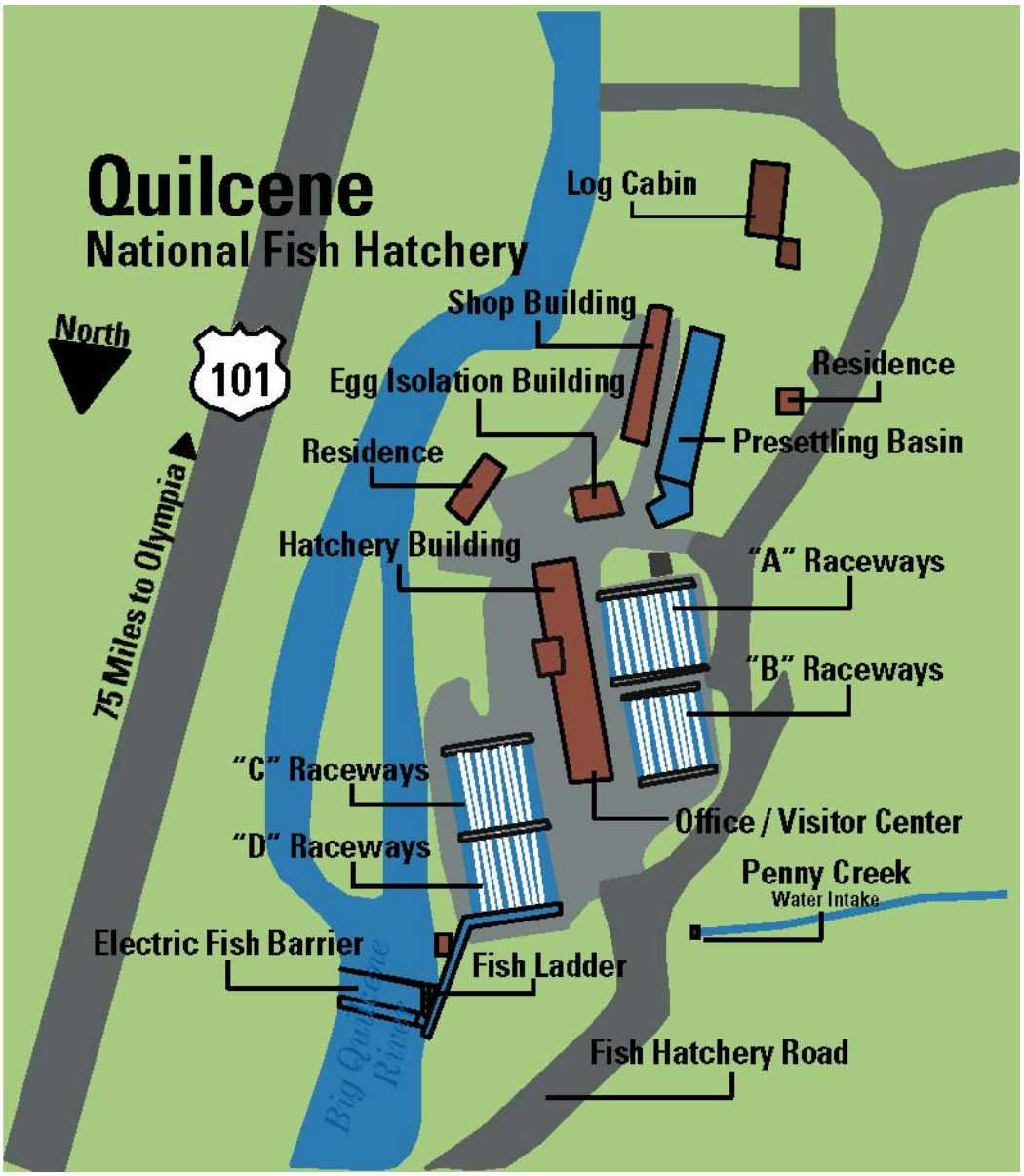

Figure 3. Quilcene NFH site map.

2.3.1 Isolation/Quarantine Building -The isolation/quarantine building was constructed to allow for flexibility in management of depressed or endangered fish stocks or other aquatic species. Any aquatic organisms brought in could be isolated from the production fish on station to prevent transmission of any potential diseases.

Construction of the isolation/quarantine building at Quilcene NFH was completed in the summer of 1999. The building has eight vertical incubators (half stack) with eight drawers each; two deep egg troughs that can incubate to the eyed egg stage; an egg working trough; water chillers to mark otoliths; and a packed column to remove nitrogen gas from water. The effluent can be treated with chlorine, routed to a 1500 gallon contact chamber (30 minutes) and then dechlorinated prior to entering the Big Quilcene River. Chlorine monitors are located in the chlorine contact chamber and at the outfall from the dechlorinator. These monitors are connected to the station's alarm system.

The water source is Well #1, which has redundant 50 gallon per minute pumps. A back-up propane generator serves the isolation/quarantine building, Well #1, and the drum screens/lights at the settling pond for Big Quilcene River water.

2.4 Archeology/Cultural Resources

2.4.1 Historical Buildings at Quilcene NFH - With authorization of Quilcene NFH in 1909, most of the original hatchery property was acquired by condemnation, but some property was also acquired by donation in 1911. Many modifications to the hatchery structures have occurred over the years. When the first foreman arrived there was a 40 ft x 86 ft hatchery building and a foreman's cottage. The only building still dating from that time is the hatchery building, which has had several modifications and additions. The original part of this building is referred to as the "north tank room." A brief recount of further structural and facility changes at Quilcene NFH follows (see Figure 3 for present-day hatchery facilities):

1914 - Additional residences were added, including a frame garage and paint storage building, which have since been removed.

1930s - A shop building was added.

1940s - Penny Creek water supply system was re-constructed.

1950s - The hatchery building was enlarged and reconditioned, and heating and refrigeration were installed. Thirty 6 ft x 60 ft raceways were built, as well as an adult holding pond, three new residences, and a service building.

1960s - The service building was enlarged and two new residences were constructed. Eighteen 8 foot x 80 foot raceways, a fish ladder, and a new domestic well with associated pipeline were constructed. The office and visitor center with aquaria and a laboratory were completed. The Penny Creek water supply was expanded.

1980s - Twenty-one 8 ft x 80 ft raceways were constructed to replace the 6 foot x 60 foot raceways, and a pollution abatement facility was constructed.

1990s - The raceway system was connected via pipeline to the pollution abatement facility. The suspended-electrode weir was replaced with a graduated field fish barrier in 1990.

1998 - A 24 ft x 200 ft pre-settling pond was constructed to reduce turbidity and sediment load of Big Quilcene River water before it enters the raceways. Property purchased for this project had an old inn and restaurant dating to the 1920s. After inspection, the Service Regional Archeologist concluded that the building had been altered too many times and too recently to be considered for "historic" status. Future disposition of these buildings is uncertain. An isolation/quarantine building was constructed to aid in the restoration of depleted aquatic species from watersheds outside of the basin.

2000 - A major office remodel was accomplished which provided much-needed space but eliminated the visitor center and aquaria. Handicapped visitor access to the office and restrooms was improved considerably with the remodel.

2001 - The service/shop building, which failed its 1999 seismic inspection, was severely damaged during the Nisqually earthquake on February 28, 2001. The "C" raceway deck was renovated to address a settling problem, and the Penny Creek water intake system was renovated for safety purposes.

2003 - A replacement shop building was constructed to the east of the pre-settling pond and put into use in July 2003. A new electrical service (main breakers and meters) was placed east of the isolation/quarantine building. The old service/shop building, old electrical main breaker service (located in the old service/shop building) and paint shed were demolished in October 2003.

2.5 Watershed/Ecosystem Setting

2.5.1 General Description - The Big Quilcene watershed is a diverse ecosystem encompassing 53,016 acres from Mt. Constance at an elevation of 7,747 feet in Olympic National Park to sea level at Quilcene Bay. Within the watershed, 41,734 acres of land (79% of the watershed) are administered by the U.S. Forest Service (USFS), 6,449 acres are owned by private or municipal interests, 3,676 acres are managed by the Washington State Department of Natural Resources, and 1,158 acres lie within the Olympic National Park.

The watershed displays a wide range of physical, biological, and social functions. Three main tributaries comprise the majority of the watershed: the mainstem Big Quilcene River, originating

from Buckhorn Mountain; Tunnel Creek, originating from Mt. Constance; and Townsend Creek, originating from Mt. Townsend. Other tributaries to the Big Quilcene River include Penny Creek, Mile and a Half Creek, Three Mile Creek, and numerous unnamed streams. The watershed drains approximately 83 square miles of the eastern Olympic Peninsula via 117 miles of streams.

The two water sources most important to the operation of Quilcene NFH are the Big Quilcene River and its tributary, Penny Creek. Both provide water for fish cultural operations and originate from USFS lands. The Big Quilcene River, with approximately 20 miles of mainstem length, also provides salmon spawning and production habitat that varies from "poor" below RM 1, due to lack of pools, cover, large wood, side channels, and stable substrate to "good" between RM 9 and RM 10.6 (Zajac 2002).

2.5.2 Geology - The watershed was shaped by glacier activity 18,000-20,000 years ago. The upper watershed was also influenced by earlier alpine glaciations. Glacial damming of the Big Quilcene River resulted in sediment deposition up to 2,700 foot elevation in parts of Tunnel and Townsend Creek drainages. Bedrock is part of the Crescent Formation, consisting of folded marine basalts and volcanic breccia with interbeds of sedimentary and metasedimentary bedrock. Sandstones, shales, and conglomerates make up most of the sedimentary rocks. Soils on the lower slopes and ridges are mostly of glacial origin and tend to be gravelly textured in the upper horizons. Valley bottom soils tend to be finer material of alluvial origin (Geomax 1994, as cited in USFS 1994).

2.5.3 Climate and Hydrology - The watershed has a mild maritime climate. Average annual precipitation recorded at the USFS Quilcene Ranger Station is 51 inches. Over 80% of the precipitation falls between October and April. Summers are relatively dry (Geomax 1994, as cited in USFS 1994). Precipitation occurs as rain below 2000 feet, rain and snow between 2000 and 4000 feet, and as snow above 4000 feet.

Most high river flows result from rain-on-snow events in the transitional snow zone between 2000 and 4000 feet. Monthly average flows in the Big Quilcene River as measured just below the Port Townsend City diversion from 1993 to 1999 ranged from a low of 37 cfs in September to a high mean of 250 cfs in December. Stream gauging data collected by the USGS in 1927 indicated an instantaneous peak discharge of 1,620 cfs. Big Quilcene River water temperatures as measured at the Quilcene NFH from 1983 to 1993 ranged from a low mean of 39.6ºF (4.2ºC) in January to a high mean of 54.4ºF (12.4ºC) in August.

2.5.4 Fish and Wildlife - Terrestrial habitats in the watershed are used by blacktail deer, elk, marmot, black bear, bobcat, cougar, mountain goat, as well as smaller mammals. Bird species include pileated woodpeckers, neotropical birds, northern spotted owl, northern bald eagle, various hawks, band-tailed pigeon, and marbled murrelet. The northern spotted owl, northern bald eagle, and marbled murrelet are listed under the Endangered Species Act.

Aquatic habitats are used by coho, pink, fall and summer chum salmon, steelhead, rainbow, brook, and cutthroat trout, and sculpins. Bull trout/Dolly Varden char have been reported in the

Big Quilcene River below RM 2.5 and in Penny Creek. Both summer chum salmon and bull trout are listed as federally threatened species under the Endangered Species Act. Various ducks, gulls, dippers, herons, kingfishers, beavers, raccoons, and otters frequent the streams as well.

2.5.5 Vegetation - Five vegetation zones are found in the Big Quilcene watershed: western hemlock, silver fir, mountain hemlock, subalpine fir, and Douglas fir. Understory vegetation includes sword fern, salal, Pacific rhododendron, white rhododendron, big huckleberry, Alaska huckleberry, blue leaf huckleberry, red heather, lupine, and various sedges, herbs, and lichens (USFS 1994).

2.5.6 Habitat Conditions - The Big Quilcene watershed has had an intense fire history compared to most of the Olympic Peninsula, except for the Dungeness and Elwha River drainages. The first fire for which evidence can be found occurred in 1308 and affected almost all of the watershed and much of the Olympic Peninsula. Beginning with the fire of 1308, natural fires occurred at about 200-year intervals with major fires evident in 1508, 1638, 1701, and 1860. Most fires since 1860 have been smaller and human-caused (USFS 1994).

The large natural fires usually resulted in stand replacement since the interval between fires allowed for accumulation of ground and ladder fuels resulting in hot crown fires that killed most of the trees (USFS 1994). The prominence of Douglas fir in the landscape is a result of the watershed's extensive fire history. Another result of these large fires was several years of surface erosion and many more years of mass wasting. Sediment levels in nearby streams and aquatic populations were undoubtedly affected, and plant and wildlife communities may have taken years to return to pre-burn levels.

Before 1855, three known native communities used the Big Quilcene watershed: The Chemakum, Klallam (present day Port Gamble S'Klallam), and Twana (present-day Skokomish) (Righter 1978, as cited in USFS 1994). The Twana had at least one village near the present town of Quilcene, and the first reported homestead was established at the present site of Quilcene in 1860. The first major influx of settlers occurred between 1890 and 1895. Early settlers anticipated making a livelihood at farming. Generally, farming failed due to difficulty of getting the products to market. A second wave of settlers arrived between 1900 and 1910 intent on timber harvest and mining. During this early period only one logging company is known to have operated in the Big Quilcene watershed. Hundreds of mining claims were filed on Mt. Constance and Iron Mountain (Righter 1978, as cited in USFS 1994). The most successful mine was abandoned in 1920.

The population in the area continued to grow and the town of Quilcene was established near the mouth of the Big Quilcene River on the south side of the river. Quilcene was eventually moved upstream to its current location on the north side of the river to avoid recurring floods (Al Jakeway, per. comm., 2001). Flood control measures (diking) from Rodgers Street to the mouth of the Quilcene River have caused the river mouth to extend 1700 feet into Quilcene Bay. Flood control measures were initiated as early as the 1880s. Diking, filling, and excavation have altered about 26% of the historic Quilcene Bay delta (Jefferson County 1998, as cited in WDFW and Point-No-Point Treaty Tribes 2000).

In 1897, the Olympic National Forest was established. The USFS currently maintains two campgrounds and 30 miles of trails on National Forest lands within the Big Quilcene watershed. Recreational use in the watershed is estimated to be 8,000 to 20,000 visitor days each year (Marc McHenry, USFS, per. comm., 2000).

In 1911, Quilcene NFH was constructed at the confluence of the Big Quilcene River and Penny Creek. Since then, the Service has acquired lands adjacent to the original hatchery site to construct and maintain other hatchery structures and to maintain water quality for fish production. Stream bank work, including barbs and revetments, has been installed on the Big Quilcene River mainstem to protect hatchery property from erosion.

In 1928, the City of Port Townsend constructed a timber crib diversion dam to meet its municipal and industrial water requirements. The dam is located above anadromous fish access on the Big Quilcene River just below its confluence with Tunnel Creek. The water is piped underground approximately 28 miles to Port Townsend. The intake is fitted with a trash rack but it is not screened to prevent fish entry.

Successful culturing of shellfish in the Quilcene area began in the 1930s with the introduction of Japanese seed oysters. Commercial harvest of oysters was fully underway by the mid-19th century. This in turn led to the eventual introduction of other exotic species of shellfish and the thriving shellfish seed industry which is seen today in the Quilcene area (USFS 1994).

In 1938, Olympic National Park was established to provide protection for Roosevelt elk and the old-growth rain forest ecological community. Tunnel Creek, a major tributary to the Big Quilcene River, originates within the Olympic National Park. Habitat within Olympic National Park remains in pristine condition today.

In the mid 1950s, the Hiddendale community was established at about RM 3.8 on the south bank of the Big Quilcene River. Again, streambank work, including barbs and revetment, has been installed on the Big Quilcene River mainstem to protect private property at this community.

Timber harvest has been the most consistent and long-lived commercial venture in the watershed. Recorded acres clear cut ranged from a low of 21 during the 1920s to a high of 2,489 during the 1980s (USFS 1994).

Many agencies are currently addressing habitat deficiencies in the Big Quilcene River watershed. Active habitat improvements include land acquisition and dike setbacks in the lower river (Al Latham, Jefferson County, per. comm., 2000). Gravel traps are installed in the lower river, when funding is available (Ken Cook, Jefferson County, per. comm., 2000), to reduce flooding impacts to land owners and to reduce gravel aggradations in spawning areas. The Skokomish Tribe has installed engineered log jams at about RM 2. The USFS has obliterated logging roads and added woody debris structures in some sections of the upper watershed to improve habitat for resident trout (Marc McHenry, USFS, per. comm., 2000). Passive habitat improvement is being implemented by the USFS, since it classified most of the watershed as “Late Successional

Reserve" in 1994. This action is primarily aimed at promoting old-growth development by eliminating timber harvest after the stands reach the age of 80 years. Younger stands may be thinned, but no other harvest is scheduled by the USFS in the near-term (Marc McHenry, USFS, per. comm., 2000).

2.5.7 Current and Future Development - The population in the Big Quilcene River basin is expected to increase by about 50% in the next 20 years. Most of this growth will likely occur in the town of Quilcene and in shoreline areas near Point Whitney (Jefferson County 2000, as cited in Parametrix et al. 2000). Increased population requires increased paved surfaces for homes, driveways, roads, and commercial infrastructure. This could potentially result in increased runoff, reduced groundwater recharge, and adverse impacts to groundwater and stream hydraulic continuity.

Population growth in general, both locally and regionally, will result in increased "visits" to the upper watershed areas as well. This could potentially lead to increased impacts and demands on plant, fish, and wildlife communities.

2.6 History of Hatchery Program

2.6.1 Legal Authority - Quilcene National Fish Hatchery was authorized by 35 Stat.589 on June 29, 1909. This statute authorized the Secretary of Commerce and Labor to establish "two or more fish cultural stations on Puget Sound, or its tributaries in the State of Washington, for the propagation of salmon and other food fishes." The Act contains no specific language concerning the species the station was to rear or the specific waters to be stocked by the hatchery.

The Hood Canal Salmon Management Plan (HCSMP), under which the Quilcene NFH program operates, was established to provide guidelines for the harvest, protection, rehabilitation and enhancement of salmon resources originating from or passing through Hood Canal waters from the mouth of Hood Canal southward. The HCSMP is intended to comply with and address all regional issues required by the Puget Sound Salmon Management Plan and meet guidelines for Regional plans as suggested by the Salmon and Steelhead Conservation and Enhancement Act. The primary goal of the HCSMP is to maximize the long term net benefits from the salmon resources in a manner that provides clear policy and technical guidelines, minimizes disagreements, and improves coordination between parties.

Hatchery operations are influenced by the following authorities, policies, and agreements.

Policies:
- -Secretarial Order #3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act
- -Viable Salmon Populations Strategy, NMFS
- -Fish and Wildlife Service Recreational Fisheries Policy, NPI #89-25
- -Executive Order #12962 of June 7, 1995 – Recreational Fisheries

Case Law: -*U.S. v Washington*, 384 F. Supp. 312, 1974
-Hoh v. Baldridge Framework Management Plan

Agreements: -Memorandum of Agreement with Quinault Nation, 1965
-Cooperative Agreement with Quinault Nation, 1991
-Cooperative Agreements with Makah Tribe, 1994, 1996
-MOU – BIA, carcass disposition to tribes
-MOU – DOJ, carcass disposition to Federal Prison System
-Puget Sound Salmon Management Plan, 1985. U.S. v Washington, 384 F. supp. 312, sub no. 85-2 (W.D. Wash.)
-Hood Canal Salmon Management Plan, 1986
-Stipulation and Order Concerning Co-Management and Mass Marking, April 28, 1997, U.S. District Court, Seattle, WA
-Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State, revised October 1997

Legislative Authorities: -Magnuson Fishery Conservation and Management Act (16 USC 1801-1882)
-Quilcene NFH Authorization 35 Stat. 589, dated June 29, 1909
-National Invasive Species Act of 1996
-Omnibus Appropriation Bill of 2003 (Mass Marking Law)

Regulations: -Endangered Species Act
-Biological Opinion on Artificial Propagation of Summer Chum Salmon in Hood Canal/Strait of Juan de Fuca, NMFS
-Clean Water Act

2.6.2 Production and Management History - In 2000, stock histories for the various species as recorded in handwritten hatchery logbooks dating back to 1911 were entered into a computer database (Kane and Moore 2001). While the historic record of fish production is incomplete due to missing logbooks for some years, data exist to confirm the source and destination of various stocks that have been raised at Quilcene NFH. Known stock dynamics for currently raised species are detailed below. The database is available from WWFWO - Division of Fisheries or is accessible at the WWFWO on the shared network drive as G:\AR\FRED\QuilLogs\Quillog.dbf.

Species historically reared at Quilcene NFH include coho salmon (*Oncorhynchus kisutch*), fall Chinook salmon and spring Chinook salmon (*O. tshawytscha*), fall chum salmon and summer chum salmon (*O. keta*), sockeye salmon and kokanee (*O. nerka*), pink salmon (*O. gorbuscha*), winter steelhead and rainbow trout (*O. mykiss*), brook trout (*Salvelinus malma*), cutthroat trout (*O. clarki*), and Montana blackspot trout (cutthroat) (*O. clarki*).

The earliest records of Quilcene NFH operation indicate that chum salmon, coho salmon, pink salmon, Chinook salmon, and steelhead trout were propagated and distributed into local streams

and other rivers tributary to Hood Canal and the Strait of Juan de Fuca. A satellite station operated on the Duckabush River, and weirs and traps operated annually on the Dosewallips and Little Quilcene Rivers and at Walcott Slough to capture adult salmon, were phased out as salmon runs declined or the station's priorities changed.

Specifically, sockeye salmon were added to the Quilcene NFH rearing program in 1927. In 1930, a trout rearing and stocking program was begun at the Quilcene NFH to provide cutthroat trout and brook trout primarily for waters in the Olympic and Mt. Rainier National Parks, military reservations, and McNeil Island Penitentiary. Rainbow trout were added to the program in 1933. Once initiated, trout production proved to be a major segment of the Quilcene NFH program for over 40 years.

In 1978 production of spring Chinook salmon was begun at the hatchery, in accord with the Puget Sound Salmon Management Plan, to preserve and enhance depressed spring Chinook stocks in Puget Sound. Concurrently, the trout program was discontinued to provide rearing space for the spring Chinook salmon. By this time, the sockeye and pink salmon and steelhead trout programs had been discontinued. As indicated above, the fall Chinook salmon program was discontinued in 1979 after coded-wire tagging indicated the program was not showing favorable survival rates and because of difficulties in getting broodstock into the hatchery. Similarly, in 1993, the spring Chinook salmon program was discontinued because of poor returns and low fishery contributions.

The hatchery currently raises coho salmon only. Hatchery records indicate that coho salmon are largely a local stock, with some importation of Dungeness, Eagle Creek (Clackamas River), Sultan Station (Skykomish River), and University of Washington stocks. Coho salmon have been raised continuously since 1911.

Fall chum salmon and summer chum salmon originated from local stocks, with no documentation of outside imports. Fall chum salmon production in the Big Quilcene River was de-emphasized in favor of production at Walcott Slough Trapping Facility. The Walcott Slough program exported many eggs to chum salmon programs throughout Puget Sound. However, due to harvest management concerns over winter steelhead trout, the Walcott Slough production program was ended in 1989 and the program was moved back in total to Quilcene NFH and the Big Quilcene River where it was terminated in 2003 due to limited harvest. Summer chum salmon were originally produced until 1938.

In 1991, the State of Washington and Treaty Indian Tribes identified Hood Canal summer chum salmon as a critically depressed stock in a statewide inventory of salmon and steelhead populations (Washington Department of Fisheries et al. 1993). In response to this decline, Quilcene NFH and the Service’s Western Washington Fishery Resource Office initiated a summer chum salmon recovery program on the Big Quilcene River in 1992, in cooperation with WDFW and the Point-No-Point Treaty Council. The species was subsequently listed as federally threatened throughout Hood Canal and the eastern Strait of Juan de Fuca in 1999.

*Beach seining in Quilcene Bay***.**

Adult summer chum salmon were collected in Quilcene Bay during August and September from a commercial beach seine fishery targeting coho salmon. Up to 389,000 fry annually were produced at Quilcene NFH and released into Big Quilcene River. Returns of summer chum salmon to the Big Quilcene River have increased since inception of this program. In addition to enhancing the summer chum salmon run in the Big Quilcene River, Quilcene NFH also began transferring eyed eggs to Big Beef Creek Hatchery in 1996, as part of an effort to re-establish a summer chum salmon run in Big Beef Creek, where the species had been extirpated. The program was deemed a success and terminated in 2004, as planned. Escapement will be monitored in the event that further assistance is needed.

From 1934 until the *U.S. v Washington* ("Boldt") decision in 1976, salmon harvest in Hood Canal was entirely sport and tribal subsistence; commercial fishing was outlawed. Since 1976, commercial fisheries, both tribal and non-tribal, were included as a part of the local harvest. Since 1992, coho salmon harvest methods in Quilcene Bay shifted from gillnets and set nets to beach seine methods so that live release of incidentally caught summer chum salmon could occur. As summer chum in the Quilcene River have increased in abundance, limited gillnet fishing has been re-instituted, along with beach seine harvest. U.S. fishing for coho in the ocean and the Strait of Juan de Fuca was limited in the early 1990s to protect weak wild stocks, including Hood Canal coho salmon. In the late 1990s, Canada also severely limited fishing on coho salmon to protect its own stocks, many of which had become imperiled. During this same period, U.S. coho salmon stocks, including Hood Canal stocks, were again plentiful and available for more liberal harvests. Institution of mass marking and mark-selective sport fishing for coho salmon in the late 1990s sought to preserve and expand recreational salmon fishing opportunities.

2.6.3 Biological Risks and Ecological Interactions Between Hatchery Coho Salmon and Wild (Listed) Hood Canal Summer Chum and Puget Sound Chinook Salmon

All hatcheries must consider their potential for adversely impacting the aquatic community. To help assess potential impacts, the Service developed a Hatchery and Genetic Management Plan (HGMP) for Quilcene NFH. This management plan was drafted to assess our program and meet Endangered Species Act requirements, and identify listed species "take" levels to NOAA Fisheries. The plan was originally drafted in 1999 and was revised in 2005. The plan assesses the potential impacts from hatchery operations including; water withdrawal and effluent discharge, broodstock collection and mating, juvenile fish health and releases, ecological interactions, carcass disposition, and monitoring and evaluation.

The following information was primarily extracted from our 2005 HGMP and discusses biological risks and ecological interactions between hatchery coho salmon and hatchery

operations and listed Hood Canal summer chum and Puget Sound Chinook salmon. Most of the information addresses potential impacts to Big Quilcene River summer chum in the freshwater environment. A reproducing Big Quilcene River Chinook salmon stock does not exist. Impacts in the estuarine habitat on either species are unknown. Funding for additional monitoring regarding some aspects of ecological interactions has been identified via the FONS process.

2.6.4 Hatchery Water Intake and Use - Listed fish; summer chum salmon and Chinook salmon, do not occur above the hatchery weir nor in Penny Creek, thus are not subject to direct take through the hatchery intake system. Water withdrawn from the Big Quilcene River is pre-settled in a concrete basin to reduce sediments entering the raceways. A rotating drum screen system prevents naturally produced fish (primarily trout) from entering the rearing system and shunts them to piping that returns them to the river.

Penny Creek, a tributary to the Big Quilcene River, is used for incubation and early rearing water. The water temperature is slightly higher than Big Quilcene River, but exhibits a naturally varying seasonal and diurnal temperature profile. Later hatchery rearing stages are completed on mixed Big Quilcene/Penny Creek water. Big Quilcene River is the primary component of rearing water at the final stage of hatchery rearing.

Hatchery effluents are settled in a concrete basin and the solids are removed as needed (about every other year). Quilcene effluent discharges meet established water quality standards.

2.6.5 Brood Stock Collection - Brood fish enter the hatchery via a fish ladder associated with a graduated-field electric weir that spans the river. Adults ascend the ladder and enter a collection channel, which is the outflow channel for the lowermost bank of raceways. Two of these raceways are used for adult holding of segregated males and females.

2.6.6 Genetic Introgression – Historical releases of Quilcene NFH coho fry into local streams, the use of Quilcene NFH coho stock in two saltwater net pen operations, and coded-wire tag recoveries indicate some level of straying of Quilcene NFH stock (Ruggerone 1997). This would suggest that genetic introgression may have been or may be occurring to north Hood Canal streams. This point was raised during the 2004 hatchery reform review. A genetic profiling study is in process to explore the level of Quilcene NFH stock influence on local natural coho populations (Ardren et al. 2006).

2.6.7 Hatchery Production – Quilcene NFH releases into the Big Quilcene River are similar in number to the other Hood Canal hatchery coho production operations. Species production mixes and expanded fish health knowledge at Quilcene NFH have reduced releases from nearly 700,000 smolts in the 1980s to the current level of 400,000. The release strategy, both timing and fish size, promotes quick exit from the river as evidenced during snorkel surveys and thus provides little opportunity to interact with other salmonids.

2.6.8 Disease – Quilcene NFH fish health monitoring, prevention, and treatment is guided, advised, and conducted by the nearby Olympia Fish Health Center. Operational standards used by the OFHC are contained in the Fish Health Policy and Implementation Guidelines (713 FW 1-

5) and the Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State (NIFC et al. 1997). Also, additional measures to produce healthy smolts are often discussed within the hatchery evaluation team. The discussions have included density and flow indices, water reuse, marking and tagging, and adult upstream passage.

The increased risk to wild fish from Quilcene hatchery coho if any, would be from Coldwater disease (*Flavobacterium psychrophilum*) and to a lesser extent, Bacterial Kidney Disease (*Renibacterium salmoninarum*), since these are the two pathogens responsible for most of the mortalities in Quilcene's hatchery fish. Specific equipment and gear disinfection procedures are in place and a Hazard Analysis and Critical Control Point (HACCP) plan has been developed that further delineates methods that should reduce the risk of both pathogen spread within the hatchery and to the environment below the hatchery.

Application of the procedures and measures described above has led to healthier rearing conditions to the extent that disease outbreaks are rare and treatments are infrequent. It is unlikely that the hatchery has a significant impact on fish health downstream of the hatchery.

However, monitoring to assess a potential connection regarding pathogen spread between hatchery and wild fish and vice versa is being conducted by the OFHC. The National Wild Fish Health Survey Protocols and Procedures (USFWS 1997) are being followed for this assessment. Surveys to date have included fish populations upstream of the Quilcene NFH in both Big Quilcene River and Penny Creek. No unexpected pathogens have been identified so far.

2.6.9 Competition - Competition between or within species as adults or juveniles has been considered in the Big Quilcene River regarding the Quilcene NFH coho salmon program. Limited observations of co-mingling adult coho and summer chum salmon on the spawning ground suggest that competition between species is negligible. Most coho observed during the late summer and fall are thought to be hatchery origin with few adults remaining in the river to compete with summer chum for spawning areas or creating redd superimposition. Wild coho, if they exist, should display the normal timing of other Hood Canal stocks and return later than the earlier timed Quilcene NFH stock. Increasing fall and winter flows help to reduce redd superimposition since preferred spawning areas are reshaped as flows change.

Hatchery smolt releases are designed, through both timing and size at release, to migrate quickly from the system. Releases are coordinated with approaching darkness and incoming tides in Quilcene Bay. Limited snorkel observations in the river and boat observations in Quilcene Bay suggest that the smolts leave the Big Quilcene River during the first evening after release.

2.6.10 Predation - Hatchery origin coho salmon smolts are thought to pose a high risk of significant negative impact on wild chum salmon due to predation in freshwater when the species cohabitate an environment (Fresh et al. 1984). Summer chum juvenile fry emergence (and presumably downstream migration) in Hood Canal can range from the first week of February to the second week of April (WDFW and PNPTT 2000). By design, Quilcene NFH coho smolt releases occur around May 1 to prevent overlap with summer chum and to promote swift outmigration to reduce juvenile competition and predation.

2.6.11 Residualism - Quilcene NFH coho smolts are not believed to residualize in the Big Quilcene River. Release practices are employed that promote rapid out-migration. Limited snorkel and boat observations in the river and in Quilcene Bay support this belief.

2.6.12 Migration Corridor/Ocean - Generally, Hood Canal hatchery salmonid production has been reduced as a result of voluntary management actions or by co-manager support of the Hatchery Reform Project. Also, over the course of years species mix has changed as well. Some of the actions are designed to reduce potential negative impacts to summer chum (ESA listed) in the freshwater and estuarine environments. Impacts to the oceanic rearing environment and species interactions are unknown. Coded-wire tagged Quilcene coho are generally recovered in British Columbia, Washington, and Oregon, suggesting both a northerly and southerly movement once they exit the Strait of Juan de Fuca.

Ocean rearing conditions are dynamic. Consequently, fish culture programs might cause density-dependent effects during years of low ocean productivity, especially in nearshore areas affected by upwelling (Chapman and Witty 1993). To date, research has not demonstrated that hatchery and naturally produced salmonids compete directly in the ocean, or that the survival and return rates of naturally produced and hatchery origin fish are inversely related to the number of hatchery origin smolts entering the ocean (Enhancement Planning Team 1986). If competition occurs, it most likely occurs in nearshore areas when (a) upwelling is suppressed due to warm ocean temperatures; and/or (b) when the abundance or concentration of smolts entering the ocean is relatively high. However, we are only beginning to understand the food-chain effects of cyclic, warm ocean conditions in the eastern north Pacific Ocean and associated impacts on salmon survival and productivity (Beamish 1995; Mantua et al. 1997). Consequently, the potential for competition effects in the ocean cannot be discounted (Emlen et al. 1990).

The Hatchery Reform Project suggested that ocean carrying capacity be considered when sizing a hatchery program, much like sizing a program to the hatchery carrying capacity. Such an endeavor, while conceptually desirable, may be nearly impossible to apply. Actual application would require knowing the carrying capacity of specific oceanic areas up to two years in advance of annually changing conditions, the true migration and rearing tendencies of all stocks, and would require international coordination and collaboration regarding collective hatchery production changes.

Alternatively, the hatchery program may be filling an ecological niche in the freshwater and marine ecosystem. A large number of species are known to utilize juvenile and adult salmon as a nutrient and food base (Groot and Margolis 1991; McNeil and Himsworth 1980). Pacific salmon carcasses are also important for nutrient input back to freshwater streams (Cederholm et al. 1999). Reductions and extinctions of wild populations of salmon could reduce overall ecosystem productivity. Because of this, hatchery production has the potential for playing an important role in population dynamics of predator-prey relationships and community ecology. The Service speculates that these relationships may be particularly important (as either ecological risks or benefits) in years of low productivity and shifting climactic cycles.

2.6.13 Harvest – Impacts to weak coho stocks are thought to have been minimized through the mass marking of Quilcene NFH coho and implementation of mark-selective fisheries in coastal Washington and the Strait of Juan de Fuca. Acceptable harvest impacts to summer chum in Quilcene Bay are described in the Summer Chum Salmon Conservation Initiative. Additional gear and season restrictions for coho harvest have been employed to minimize impacts to summer chum.

2.6.14 Cutthroat Trout - The Big Quilcene River supports a healthy population of cutthroat trout representing multiple age classes. It is quite likely that coho released from Quilcene NFH provide a brief prey base for adult cutthroat. Brief and minimal prey and space competition between the coho smolts and cutthroat trout are expected due to our release strategy.

2.6.15 Bull Trout - Bull trout are not known to inhabit the Big Quilcene River watershed. No bull trout were identified during fish surveys conducted by the U.S. Forest Service (USFS 1992). Only two anecdotal observations of char are recorded; one by a fisher below the highway 101 bridge in the Big Quilcene River and one by USFWS personnel in Penny Creek. Funding for a more comprehensive bull trout survey has been identified via the FONS.

2.7 Beneficial Uses

2.7.1 Cultural Values - Historically, the primary groups of Native Americans who used the Quilcene region were the Chemakum, Klallam, and Twana, with the Twana being the primary inhabitants of the Quilcene watershed (Elmendorf and Kroeber 1992, as cited in USFS 1994). The present day surviving descendants of the Twana are the Skokomish. Living resources used by these people include fish, sea mammals, mollusks, waterfowl, land game and vegetable products. Fish caught in the Hood Canal area included Chinook salmon, coho salmon, chum salmon, pink salmon, and steelhead trout. Most of the harvest of salmon occurred in the rivers using weirs, dip nets, and harpoons.

In more recent times, Hood Canal was designated a preserve and commercial fisheries were illegal from 1934 until the U.S. v Washington decision in 1976. The shellfish industry was established in the 1930s and still exists today.

2.7.2 Public Uses - Present public uses of Quilcene NFH origin fish include harvest (commercial, tribal, and sport); tourism (the hatchery serves as a destination for “fish watching” during spawning); and the more difficult to define benefits to the public in the form of nutrient enrichment to the ecosystem, including the wildlife watching opportunities derived from this enrichment. The hatchery is also a source of information and education about fish and wildlife values and activities in the region.

2.7.3 Harvest Contribution - Current coho production levels call for 400,000 smolts (24,000 lbs) from the hatchery itself and 200,000 pre-smolts (9,050 lbs at transfer) to the Skokomish Tribal net pens in Quilcene Bay. Current production emphasizes migratory smolts to avoid competitive impacts on other fish populations. (Figure 4; Table 1). Smolts from the on-station release have contributed an annual average of 17,693 adults to fisheries and 7,778 to the hatchery

rack (Table 1). The ratio of catch to escapement has dropped in recent years due to harvest limitations (Figure 5). Adult salmon that are surplus to hatchery needs support local tribal subsistence programs and a food program for the federal prison system.

2.7.4 Economic Benefits - Adult salmon resulting from hatchery releases contribute to all-citizens sport and commercial fisheries in Canada, Washington coast, Strait of Juan de Fuca, Hood Canal, Dabob Bay, Quilcene Bay, and the Big Quilcene River. The fishery for coho salmon in Quilcene Bay is predominantly a tribal fishery.

Distribution of surplus Quilcene coho to Elwha tribal members.

From 1985 to the early 1990s, Quilcene NFH coho salmon played an important role in the allocation of fishing opportunities under U.S./Canada Treaty negotiations. Canadian fishers were offered coho salmon harvest if they agreed to limit their Chinook salmon harvest so the U.S. could rebuild its Chinook salmon runs. U.S. coho salmon were also seen as a trade-off for U.S. harvest of Fraser River sockeye salmon in the Strait of Juan de Fuca and the San Juan Islands. Currently, there is little Canadian harvest of coho salmon due to the weak status of Canadian stocks. This probably accounts in part for the large adult returns to Quilcene NFH beginning in the late 1990s. For the foreseeable future, the Canadian harvest of U.S. coho salmon is expected to remain very low due to the critical status of many southern British Columbia coho salmon stocks. Quilcene NFH coho salmon remain an index stock for U.S./Canada harvest allocation purposes.

The economic value of Quilcene NFH fish can be arrived at in a myriad of simple and complex ways. The most obvious is the direct value of the fish in commercial fisheries, both tribal and non-tribal. Commercial value of fish is higher in the marine areas than in the near-shore areas due primarily to the condition of the flesh.

Values of fish in a sport fishery are much more difficult to quantify but are generally agreed to be higher on a per-fish basis than in a commercial fishery. There are numerous extrinsic values which must be considered, such as fuel, food, lodging, etc., and the unquantifiable values of a high quality outdoor experience. Any determination of economic benefits should account for multiplier benefits of dollars spent in a local economy along with the direct benefits of dollars spent for fishing-related expenses.

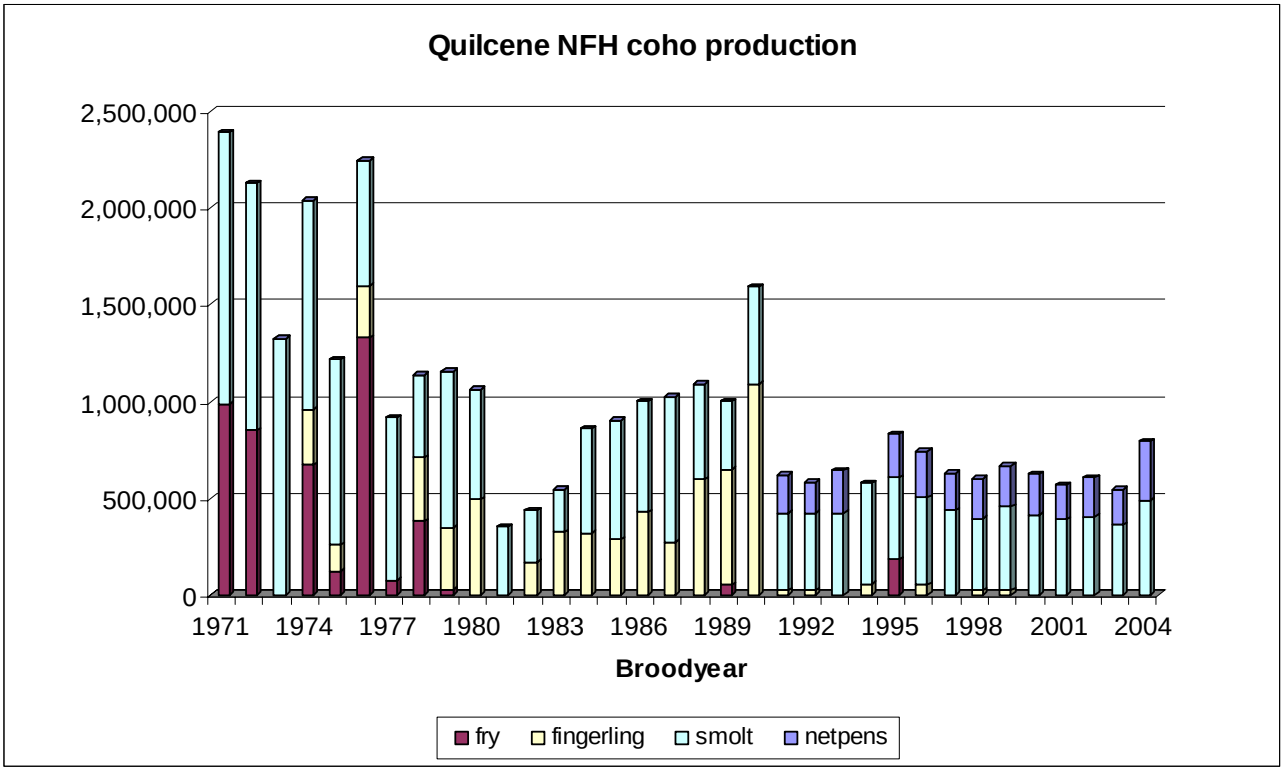

Figure 4. Coho salmon production history at Quilcene NFH.

Table 1. Coho salmon production from Quilcene NFH. (Data source: USFWS Fishery Resource coded-wire tag database)

Release Location	Brood years	Average annual releases			Annual average adults (from smolt releases)		
		Fry	Fingerling	Smolt	Catch	Escapement	Total
On-station	1971-2004	102,747	76,260	488,395	17,693	7,778	25,371
Net pens	1991-2004	-	-	194,928	1,640	1,514	3,154
Hood Canal	1971-1989	62,368	131,515	-	-	-	-
Makah Reservation and vicinity	1971-1980	-	102,519	333,106	-	-	-

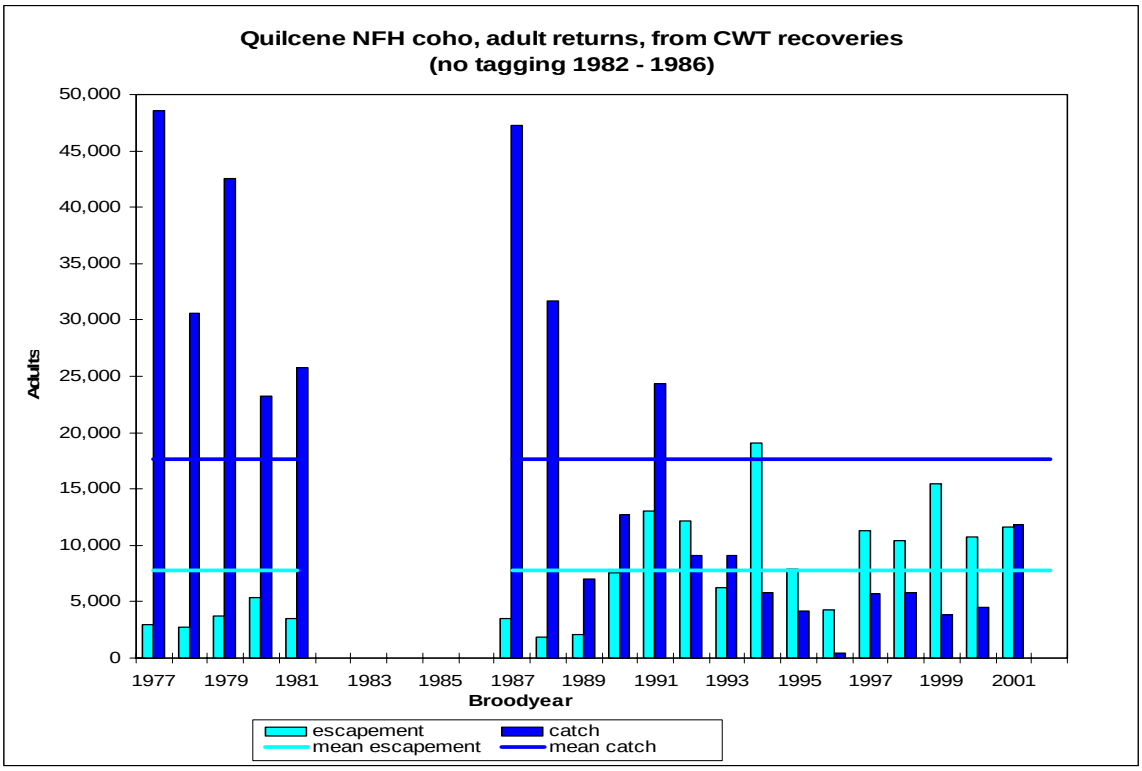

Figure 5. Quilcene NFH coho salmon catch and escapement.

There is currently an economic study underway, initiated by Quinault NFH, which seeks to assign an economic value to all the fish produced by the Olympic Peninsula Federal hatcheries. The study is being conducted by James Caudill, the Service's staff economist in Arlington, VA.

2.7.5 Ecosystem Benefits - Cederholm et al. (2000) listed over 70 species of birds, mammals, amphibians, and reptiles that benefit from the presence of adult salmon carcasses in an ecosystem. This is in addition to the direct benefits derived by fish, which have been observed feeding on carcasses of spent salmon. The components of decaying salmon contribute to the production of plants and animals within the riparian zone at all trophic levels. Cederholm et al. (2000) calculated system nutrient inputs of 0.0304 pounds of nitrogen and 0.003597 pounds of phosphorus per pound of fish carcass.

Presently, up to 600 adult coho salmon are passed above the Quilcene NFH weir. Approximately 3.2 miles of anadromous fish habitat exist above the Quilcene NFH weir (Figure 1), and options to restore salmon to this habitat were assessed by Zajac (2002). Passing salmon at the Quilcene NFH weir would potentially increase overall salmon production in the system, restore some level of natural selection pressure on the population, and enhance stream productivity through nutrient enrichment from carcass decomposition.

Allowing salmon access to Penny Creek, which serves as the water source for egg incubation and fry starting, was not recommended by Zajac (2002). Disease risk and the cost of facility modifications preclude consideration of restoring salmon to Penny Creek. It is not known whether Penny Creek was accessible to anadromous fish before construction of the hatchery, as it resembles many similar streams on the west side of Hood Canal which flow through steep canyons and contain natural fish passage barriers. However, a feasibility study regarding Penny Creek fish passage has been identified through FONS.

CHAPTER 3. CURRENT PRACTICES

3.1 Water Use and Management - Quilcene NFH holds the following certificates of water right:

Source	Certificate or Permit Number	Priority Date	Amount
Penny Creek	C101	10/14/1924	10 cfs
Big Quilcene River	C4189	9/3/1946	15 cfs
Penny Creek	C4453	4/7/1951	15 cfs
Walcott Slough	C8184	5/4/1956	5 cfs
Well No. 1	C38767A	4/23/1958	0.71 cfs (320 gpm)
Well No. 3	C7275	7/29/1964	0.044 cfs (20 gpm)
Big Quilcene River	S2-28179	5/16/1991	25 cfs
Well No. 6 (domestic water)	G2-29679	5/19/1998	0.044 cfs (20 gpm)

3.1.1 Penny Creek Water Rights - The hatchery has two water rights on Penny Creek. One dated 1/14/1924 for 10 cfs, and the other dated 4/7/1951 for 15 cfs. Water diverted from Penny Creek is the only supply of production water to the hatchery building for fish egg incubation and early rearing. Quality water is essential to the entire production program. Penny Creek water is very reliable although flows drop off in the late summer months. The quality of water from Penny Creek has degraded in recent years due to logging and development in the watershed. Another threat to Penny Creek water quality for egg incubation is allowing anadromous fish upstream of the hatchery's water intake. If this is allowed, the hatchery will have to reconstruct the water intake structure, install a filtration/sterilization system, and provide a means to allow adult fish passage. This topic is gaining interest with some tribes and other interest groups.

3.1.2 Big Quilcene River Water Rights - Water diverted from the Big Quilcene River is the primary source of water for the hatchery's production raceways. The hatchery has two water rights (1946 and 1991) on the Big Quilcene River. Although the Port Townsend Paper Corporation and the City of Port Townsend own a water right on the Big Quilcene River with a priority date which precedes the hatchery's 1946 water right for 15 cfs, there is generally sufficient water to satisfy the hatchery rights. The Port Townsend Paper Corporation and the City of Port Townsend divert water out of the watershed for the drinking water of several towns and the operation of a pulp mill. This diversion is located upstream of the hatchery's water intakes. The mill has voluntarily agreed to leave at least 27 cfs in the stream during low flow periods for fish. A work group of local, state, municipal, tribal, and private entities formed a partnership to address any water problems at the hatchery, instream flow, municipal drinking water needs, and operation of the pulp mill and meets once a year at a minimum.

The second hatchery water right, obtained in 1991, is for 25 cfs. This right is seasonally limited when instream flows fall below 50 cfs (July through February) and 83 cfs (March through June). However, the hatchery's senior water right for 15 cfs is not subject to this restriction.

3.1.3 Durdle Creek Water Rights - Because of poor quality and low flows during the summer months, this domestic water supply was abandoned in 1964. We relinquished this water right in 2005.

3.1.4 Walcott Slough Water Rights - This water right covers operation of the fish trap within the tidewaters of Walcott Slough and is used only periodically. An auxiliary well used for wash-down purposes was also drilled at this site in 1977, but no water right exists for its use.

3.1.5 Well No. 1 - The original water right from 4/23/1958 for Well #1 was for 320 gallons per minute. This well was originally used for fish production and was renovated in 1998, supplying water only to the isolation/quarantine building for fish egg incubation. Two 50 gallon per minute pumps and motors were installed into the existing well casing during the renovation. The redundant pumps were installed to insure that if one pump failed the other pump could be immediately started, without endangering the incubating fish eggs. In case of power outages, a propane generator automatically starts up to operate the isolation/quarantine building, well #1, and the pre-settling pond drum screens.

There is an old connection from Well #1 to the Penny Creek water supply which enters the north tank room in the hatchery building. A new valve was installed in 1998 where the well head separates the water sources. A connection from Well #2 to the same pipeline was disconnected during the construction of the pre-settling pond in 1997.

3.1.6 Well No. 2 - This artesian well has high salt content and was drilled a number of times to different depths. A 1998 water right permit allowed withdrawal of 185 gallons per minute which, after passing through a nitrogen gas removal device (packed column), could be introduced to water supplying the raceways. This well provided a small amount of water relative to the total amount of water used in the raceways. The ground water permit for this well was cancelled in 2001 and it is not listed in the water rights table above. This well should be sealed according to Washington State standards.

3.1.7 Well No. 3 - This domestic water well was originally drilled in 1964 and served as the potable drinking water source until 1993 when it was abandoned due to iron scale plugging the casing perforations. The new well was drilled approximately 20 feet west of the original well in 1993. There were continual problems with the supply line from the original well breaking as it ran under the Big Quilcene River. The buried pipeline broke in 1995 and 1997 due to scouring of the gravel around the pipeline. In 1998, Well #6 was drilled and became the main water source for domestic water use. Well #3 has a faucet connection near the well head for domestic use but is not connected to the hatchery's water filtration/sterilization system.

3.1.8 Well No. 4 - This well is undeveloped. It was drilled and capped around the time the pollution abatement pond was originally constructed. It is located just east of the pollution abatement pond.

3.1.9 Well No. 5 - This water right was obtained when the hatchery purchased the vice-Kearney property in 1991. Very little appears to be known about this well (originally residential) as it has not been used by the Service since it was purchased.

3.1.10 Well No. 6 - This well was drilled in 1997 and is currently the main source of potable water for the hatchery. In 2002, installation of a filtration, sterilization, and water softening system began in order to meet Washington State drinking water standards for a public water system.

3.1.11 Water Systems Coordination

Water quantity and quality are inextricably intertwined at Quilcene NFH. Availability of water at Quilcene NFH is a highly seasonal prospect. While water quality from the Big Quilcene River and Penny Creek is excellent, there are extensive periods of high turbidity. Ironically, as the quantity of available water rises, turbidity also rises, so Quilcene NFH must restrict the amount of water it diverts in order to avoid entraining too much sediment. The hatchery's pre-settling pond that was constructed in 1999 has helped to reduce the sediment problem. The pre-settling pond has freed up the entire "A" bank of raceways for more rearing space, which allows the hatchery to make much lighter initial loadings of coho salmon.

City of Port Townsend water diversion

The most important partnership affecting hatchery operations is a water-sharing arrangement between the Service and the City of Port Townsend. The city currently has an unconditional year-round right to 30 cfs from the Big Quilcene River to meet its municipal and industrial needs. The city withdraws water from the Big Quilcene River about six miles upstream of the hatchery. If the city fully exercised its water right, it could effectively "dry up" the river during the low flow periods in late summer and early fall. Realizing the consequences to hatchery operations and in-stream aquatic life, the city voluntarily leaves a minimum instream flow of 27 cfs below its diversion. The city uses conservation techniques and other stored water for municipal needs when the river approaches this critical low flow. The city water system does not have a filtration system and draws water from the Big Quilcene River when the water is clear. During high winter flows, the city does not withdraw turbid water.

The Service participates in other water usage forums, not only in the Big Quilcene River, but in adjacent watersheds as well. As a result the 1998 Watershed Planning Act, a planning unit and associated sub-committees, consisting of local stakeholders and resource agencies, were

established to jointly resolve water management conflicts by developing a watershed plan, including in-stream flow recommendations. Jefferson County adopted the Water Resource Inventory Area (WRIA) 17 Watershed Management Plan in January 2005. WRIA 17 includes the Quilcene, Admiralty Inlet, Port Discovery, and Sequim Bay drainages. Development of the actual instream flow rules for WRIA 17 is still in progress. The WWFWO and Quilcene NFH also participate in the Big Quilcene River Low Flow Coordination Group that addresses low-flow water use options and monitoring needs throughout the watershed. Participants in this group also include local stakeholders and resource agencies.

The small size of the Big Quilcene River and Penny Creek watersheds limits the capacity for water storage in either system. The hatchery operates with very low flows through most summer months (usually late July through October) but usually has sufficient water for all rearing needs through the rest of the year. However, there have been years which exceptions to this rule, when floods or and droughts have occurred.

The hatchery staff monitors stream flow in the Big Quilcene River and withdrawals from the Big Quilcene River and Penny Creek. All river and well water usage is recorded in log books.

Quilcene NFH's drinking water system is a class "B" system under the Washington State Department of Health (Chapters 246-291 WAC). Under the class "B" system, a sample for coliform analysis is required to be taken at least once every 12 months. Service standards require coliform sampling every 3 months. An inorganic chemical analysis is taken at the station well and at least one nitrate sample is analyzed every 36 months. Additional testing is presented in Table 2 below:

Table 2. Water Test Schedule

Test	Schedule
Coliform	Every 3 months
Arsenic	Annual
Nitrate/Nitrite	Annual
Lead	Annual
Copper	Annual
Comprehensive Chemical & Contaminant Analysis	Every 6 years

Daily high and low air temperatures and daily rainfall information is reported to the National Oceanic and Atmospheric Administration (NOAA) weather service section at Sand Point, Washington.

3.1.12 Screening - The screening on the Big Quilcene River intake system consists of 2-inch "grizzly" bars at 3-inch spacing. The intake system supplies a single 30-inch line that leads to the pre-settling basin (Figure 3). There are two rotary drums with 0.25-inch screening in front of the channels to the raceway valves in the pre-settling basin. The current screens are not compliant with NMFS criteria, which specify 0.125-inch. Big Quilcene River water is not used in the hatchery rooms.

Two intakes are located on Penny Creek, one for the raceways and one for the hatchery rooms, each screened with 0.125-inch wedge-wire panels. The Penny Creek intakes are also screened from adult fish with large "grizzly" bars and woven metal screens. However, the sheer steepness of Penny Creek reduces the likelihood that adult fish will be present in the vicinity of the intakes.

3.1.13 Conveyance System to Hatchery and Ponds - The hatchery relies on two surface water sources for supply to the raceways. There are two intakes on the Big Quilcene River located approximately ½ mile upstream of the hatchery proper. River water enters the system valves and pipes and passes through a 200-foot-long x 24-foot-wide presettling pond and two drum screens before it enters the raceways through a series of valves. There are supply valves to all four raceway decks. Reused water is routinely used from "A" deck to "B" deck and eventually to "D" deck and finally through the outfall channel of "D" deck which also acts as a receiving channel for returning adult fish. Only fresh water can be introduced into "C" deck and oftentimes "C" deck water will be reused into "D" deck.

Penny Creek water enters through the screened intake located across the road from the entrance to the hatchery. It can be used in the raceways and is the exclusive water source for the hatchery building. It enters the raceways through a separate piping system from the river water.

The isolation/quarantine facility is supplied exclusively from Well No. 1. Water is pumped from the well immediately outside of the building and passes through aspirators and a packed column to both aerate the low dissolved oxygen water and strip all of the excess nitrogen from the raw water. After the water passes through the incubation troughs or incubators, it is chlorinated and then de-chlorinated before it is released to the river.

3.1.14 Effluent Treatment and Monitoring - Quilcene NFH is authorized to discharge effluent under NPDES permit number WA-000187-2. The permit is issued for a five year period. The current permit has lapsed, and a renewal application has been submitted. Effluent from the hatchery is monitored weekly for settleable and suspended solids and reported monthly to EPA. The discharges allowed are well within the normal operating limits of Quilcene NFH, and were formulated during periods of higher biomass in the hatchery and the use of much less efficient feeds. The pre-settling pond and subsequent fish-rearing vessels are effective at settling solids. The hatchery actually returns fewer settleable solids to the river than it takes in when the Big Quilcene River is at flood stage. The hatchery does not have any special permits to discharge any chemicals used as therapeutants.

3.2 Brood Stock Management

The following performance measures have been established at the hatchery:

Measure	Goal	Five-year[1] mean	Five-year[1] range
Spawned population	1,200	1,079	948 – 1,303
Smolts released	400,000	410,888	361,891 – 488,080
Eggs transferred	450,000	450,220	450,000 – 450,400
Pre-smolts transferred	200,000	216,499	180,187 – 307,191
Spawners passed upstream	600	537	500 – 589
Percent survival from smolt	5.0%	4.61%	3.78% - 6.03%
Smolt size at release (fish/lb)	15 - 20	21.7	20.3 – 22.3

[1] Most recent complete five years, actual years vary between measures.

Quilcene NFH is currently a single species facility rearing only Quilcene strain coho salmon. Brood stock collection at the hatchery is managed to maintain the genetic integrity of the stock. The Service ensures that adult brood stock is collected for spawning across the spectrum of the run in proportion to the rate at which they return. Adults to be held for spawning are collected throughout the return period on a schedule approximating a Normal distribution.

Adult coho return to the hatchery from mid-August through November. Brood fish enter the hatchery via a fish ladder associated with a graduated-field electric weir that spans the river. Adults ascend the ladder and enter a collection channel, which is the outflow channel for the lowermost bank of raceways (D bank). Two of these raceways are used for adult holding of segregated males and females. The held adults are treated three times weekly with 250 ppm hydrogen peroxide to control fungus.

Typically, spawning is conducted each Tuesday during the season to accommodate sampling by OFHC. Ripe females are sorted the previous day to expedite spawning. Unripe females are returned to the holding pond and held there until mature. Males and jacks are crowded, sorted for ripeness, and killed on spawning day in numbers to match the number of ripe females. Ripe fish are killed by concussion. Spawning is conducted under a portable garage frame-and-cover structure.

3.2.1 Surplus Adult Returns - Spawned and surplus fish are disposed of in a variety of ways. Adults that were treated with chemicals to control fungus growth during holding or are otherwise unfit for human consumption are buried on hatchery property. Adults that are surplus to spawning needs and are fit for human consumption are distributed to local tribes for subsistence via a 1982 Cooperative Agreement between the Service and the Bureau of Indian Affairs, or to the Bureau of Prisons via a 2006 Memorandum of Understanding between the Service and the U.S. Department of Justice.

Surplus fish going to Tribes

3.2.2 Spawning Protocol - Potential spawners are randomly selected from the receiving channel on a set schedule, e.g., 50 pairs the first week, 100 pairs the next, etc., so that an approximately Normal distribution curve is described over a six-week period. Healthy appearing fish without external wounds are held for up to 6 weeks before they are ripe for spawning. At spawning, all ripe fish are killed and spawning selection is randomized. That is to say, large fish are not matched with large fish, etc. Up to 10% of the spawned males are jacks, per HSRG recommendation. Eggs from one female are placed into a three gallon stainless steel bucket and sperm from one male is immediately added. Penny Creek water is added to the eggs and milt and gently swirled and set aside for at least one minute. Eggs are then pooled (eggs from six females) into one stainless steel bucket and taken to the hatchery building for washing. Washing consists of adding Penny Creek water and pouring off any fish tissues, blood, debris, etc. This procedure is repeated until the eggs are clean. All spawning equipment is rinsed in iodine solution before use on other fish. The last egg rinse is with a 75 ppm solution of iodine. The eggs are then placed into wire baskets that are suspended in a stainless steel trough with 75 ppm iodine solution for 30 minutes. Each wire basket holds eggs from twelve females. The eggs are then placed in deep egg troughs for incubation at 10 gpm of Penny Creek water. Enough eggs are taken on each spawning day to allow culling and/or removal of unneeded eggs and still allow for a representation of that spawning day in the timing of the run.

3.2.3 Upstream Passage - The Quilcene NFH electric weir (formally known as a "graduated field fish barrier") is not a barrier to the downstream migration of juvenile salmonids. Even if the electric field is active, it is not of sufficient voltage to be lethal to fish, especially small fish.

Hatchery weir, bypass, and fish ladder

The design of the weir itself makes it a mechanical barrier to adult summer chum and coho salmon at normal low flow conditions in the Big Quilcene River. Once energized in the late summer, the electric field is

not engaged until river level sensors indicate that there is enough flow to require an electrical barrier. In most years, this does not occur until late October. The weir is then operated until January 1st when the fall chum salmon run normally ends.

The weir has a bypass ladder incorporated into its structure, but the last big meander of the Quilcene River in 1996 isolated the upstream side of the ladder from the river. Until the bypass ladder can be made functional, adult steelhead trout or cutthroat trout pass the weir only on high flows during winter and early spring or are passed manually if encountered during coho spawning operations. Such encounters are infrequent.

Salmon use of stream habitat above human-caused impasses (fish hatchery weirs, for example), is a priority concern within the Service at the Regional and National level. This awareness has hastened development of a proposal to resume adult coho salmon passage into the Big Quilcene River above Quilcene NFH. Based on available habitat, up to 600 coho salmon from across the run and all steelhead and cutthroat trout are passed above the weir (Zajac 2002). Chum salmon are not passed since their preferred habitat is the lower river below Quilcene NFH.

There has been concern expressed that anadromous salmonid access has been blocked at Penny Creek by the hatchery structures. However, there is no evidence either supporting or denying the historical presence of adult salmon in Penny Creek. At this time, there are no plans to provide fish passage in Penny Creek. However, a feasibility study has been requested.

3.3 Incubation Strategies and Procedures

Eggs are kept in baskets in deep troughs until development to the eyed stage (eye-up) at which time the eggs are shocked, sorted, and placed into vertical stack incubators. Eggs are treated for fungus control with formalin three times a week until the eyed stage. Formalin is introduced at the head of the trough and again at the mid-point to maintain a full concentration level of 167 ppm.

3.4 Rearing Strategies

After hatched fry have absorbed their yolk sac (“buttoned up”), they are placed directly into outdoor 8-foot x 80-foot concrete raceways. Fish remain in these raceways until release. Every attempt is made to split raceways in advance of the density index reaching 0.20, in consideration of the total weight of fish in the rearing vessel, the vessel’s rearing volume, and oxygen intake of the fish as related to their size (Piper et al. 1982). Availability of water can be a constraint in this regard. Inevitably, a large number of fish must be reared in re-used water for much of their hatchery residence, but regular cleaning, improved feeds, and regular diagnostic checks by OFHC prevent or minimize the onset of disease.

3.5 Release Strategies

Quilcene NFH currently produces only coho salmon. Release goals for fish produced at Quilcene NFH are reviewed annually by the Quilcene Hatchery Evaluation Team (HET), a standing committee of Service staff that regularly reviews and plans the fish production programs at the hatchery. Formal production goals are then established in cooperation with the co-managers (WDFW and the Point-No-Point Treaty tribes) under guidelines in the Hood Canal Salmon Management Plan, which is a part of the Puget Sound Salmon Management Plan - subsequent to the decision rendered in *U.S. v Washington* ("The Boldt Decision"). Production goals are documented through the Future Brood Document process, which establishes salmon hatchery production levels for all agencies throughout Washington. Target size for coho salmon release is between 15 and 20 fish/lb (23-30g) around May 1. Table 3 shows current production goals by species and life stage for Quilcene NFH.

Table 3. Fish production goals for Quilcene NFH.

Number	Life stage	Fish size		Release site/Destination
		No./lb.	g/fish	
Coho salmon				
450,000	Eyed eggs	-	-	George Adams SFH – transferred to Port Gamble Tribal net pens
200,000	Pre-smolt	25	18	Skokomish Tribal net pens, Quilcene Bay
400,000	Smolts	15-20	23-30	On-station, Big Quilcene River

3.6 Fish Health Management Program

The primary objective of fish health management programs at Service hatcheries is to ensure the production of healthy fish. Equally important is preventing the introduction, amplification, and spread of fish pathogens which might negatively affect the health of both hatchery and naturally reproducing stocks. For additional fish health information see "Pathogens Noted at Quilcene NFH" (Attachment 3).

3.6.1 Fish Health Policy - The OFHC provides the fish health care for Quilcene NFH under the auspices of the published policy 713 FW in the FWS Manual (FWM). In addition, other fish health measures may be adopted after consideration by the HET. Fish health exams must be done prior to releases. Fish health inspections as defined by the FWS Handbook/AFS Blue Book must be performed approximately 6 weeks before any transfer. The fish health management programs at Quilcene NFH meet or exceed the Co-managers' Salmonid Disease Control Policy of 1998.

In general, movements of live fish into or out of the hatchery must be noted in the State of Washington Future Brood Document for the hatchery. If a fish transfer or release is not in the Future Brood Document, permits from the Service, WDFW, and any other states through which the fish travel must be obtained and approved by the co-managers. Fish health exam or

certification must be done prior to any releases or transfers from the hatchery to minimize risks from possible disease transmittance.

3.6.2 Management Changes Affecting Fish Health since 1993 - In 1993, the hatchery's spring Chinook program was discontinued due to poor adult returns and significant mortality of juveniles resulting from Bacterial Kidney Disease (BKD). Termination of this program reduced the amount of BKD on station, thus reducing the risk to the other species on station.

Prior to 1997, epizootics (defined as average daily mortality of at least 0.1% daily for 5 consecutive days) of Bacterial Coldwater Disease occurred on a regular basis in coho salmon and required treatment with antibiotics. Starting in 1997, densities were reduced, in particular initial ponding densities, which has reduced mortality such that antibiotic treatment has not been required for approximately 8 years. Prior to this time, the initial pondings resulted in densities that exceeded 0.33 lb/ (inch x ft^3) before the first split. The current density goal is not to exceed 0.20 lb/ (inch x ft^3). An iodine pre-rinse prior to water hardening was instituted to decrease transfer of bacteria from ovarian fluid to the eggs. Flow rates in the vertical incubator stacks were increased to 4 gpm. In addition, when eggs were treated with formalin for fungus control, hatchery staff instituted the introduction of formalin at the head and midway down the trough to help insure consistent therapeutic levels. This change in protocol also likely resulted in reduced Bacterial Coldwater Disease.

While decreasing densities and other management changes have dramatically reduced the amount of Bacterial Coldwater Disease on station, this disease continues to cause sporadic mortality. BKD is also associated with low level mortalities. In an effort to continue to improve fish health, the co-managers agreed by consensus to lower coho production in 2005 from 450,000 to 400,000 on-station release.

Based on the evolving information on best management practices for fish culture, the Quilcene HET continually evaluates and adapts to optimize fish health within the limits of budget and the facility itself.

3.6.3 Fish Health Examinations - Monthly examination: A fish health biologist (FHB) from OFHC visits at least monthly to examine fish at the hatchery. Based on observations of fish, input from the hatchery staff, and hatchery records, the FHB will determine numbers and distribution of the fish to be tested, as well as what tests will be employed.

Diagnostic Examination: Additional fish health exams are performed as determined by the FHB and/or when requested by hatchery or WWFWO personnel.

Broodstock Health Evaluation: The number of broodstock sampled will meet or exceed the minimum requirements in the USFWS Handbook/AFS Bluebook and the Washington Co-managers' Salmonid Disease Control Policy of 1998. The number and type of fish samples taken is based on programs and disease history.

The Service's Abernathy Fish Technology Center provides feed quality analysis to insure that feed manufacturers are meeting nutrient specifications to avoid nutritional diseases and contribute to healthy fish.

3.6.4 Chemotherapeutic Use - It has been, and will continue to be, the philosophy of the HET to minimize treatment of fish/eggs with drugs by practicing sound fish culture and disinfection practices. However, in some cases, medications must be used:

Treatment of Eggs: Polyvinylpyrrolidone (PVP) iodine at 75 ppm for 30 minutes during water hardening is used to disinfect eggs. Formalin at 1:6000 (167 ppm) for 15 minutes beginning one day after fertilization is used to control fungus on the eggs and is currently applied three times per week for approximately eight weeks.

Treatment of Adults: Adults are treated with 250-500 ppm of hydrogen peroxide for 1 hour, 3 days per week, for the duration of holding.

Treatment of Juveniles: Treatment of juveniles does not occur on a regular basis. If a treatment is indicated, the FHB will make recommendations to the HET and collaboratively determine a treatment plan.

Pond brooms, mortality pickers, boots, and crowders are disinfected with iodine solution between ponds. Spawning knives and buckets are disinfected with iodine solution between each group of fish handled.

Tank trucks, fish pumps, and tagging trailers are disinfected before being brought onto the station and after use in the hatchery, as warranted, during operations at the hatchery. More specific fish health guidelines regarding marking and tagging are found in Attachment 4.

3.6.5 HACCP - The potential exists for aquatic nuisance species (ANS) to spread to uninfected waters via our fish culture activities, including egg and fish transfers. Peripheral activities to actual fish culture such as fish diagnostic and fish tagging and marking activities can also pose risks.

One approach to reduce the potential risk of ANS spread is to adopt the HACCP concept used by the seafood industry to minimize seafood consumption health risks. The HACCP approach identifies points in the process, in this case fish culture and related activities, that are critical to the safety of the product or, in this case, to the risk of spreading ANS.

A Quilcene NFH HACCP plan was written in 2004 (Attachment 5) to reduce the risk of spreading specific fish pathogens. The plan was submitted to the Regional Office and is posted on the National HACCP web site (www.HACCP-NRM.org).

3.7 Monitoring, Evaluation, and Coordination

Tagging and clipping salmon

This section briefly describes current juvenile marking and adult sampling, both mark-related and genetic, that provides data for estimation of short- and long-term post-release survival, fishery contribution estimates, and changes in genetic profiles. Coded-wire tagging (Jefferts et al. 1963) is the primary identification system used for generation of these estimates. Tagging and sampling goals are presented in Table 4. These goals were developed based on statistical accuracy of the final survival and contribution estimates. Tag groups are replicated as recommended by the "PSC Workshop on Hatchery CWT Methodology" (Sands 1995). Current Quilcene NFH tag program costs are summarized in a document entitled "Hatchery Support Activities Costs Review" (USFWS 2001). Past evaluations are listed in Attachment 6.

Other short-term, *ad hoc*, pre-release evaluations are conducted. These are usually directed towards fish health problems during juvenile rearing. Generally, fish health and mortality tracking are used to evaluate these treatments instead of the costly coded-wire-tag system.

3.7.1 Mass Marking Law - The FY 2003 appropriations language (House bill, Conference Committee and Omnibus Appropriations) requires the FWS to "implement a system of mass marking of salmonid stocks released from federally operated or federally financed hatcheries including but not limited to fish releases of the coho, Chinook, and steelhead species. The requirements of this section shall not be applicable when the hatchery fish are produced for conservation purposes." The House Report further states that the FWS is expected to be a "full participant in this effort by ensuring that hatchery fish that are suitable/available for selective fisheries are visually marked to assist in the identification and recovery of wild salmonid stocks."

The mass marking law did not affect Quilcene in that coho mass marking was implemented in 1997 for the very same reasons as stipulated in the law. However, it does guide the future of the marking program regardless of future fish production changes.

3.7.2 Coho Salmon Station Releases - WWFWO will continue its standard monitoring program designed to provide survival and contribution estimates. These estimates are used to track survival trends and allow comparison among years and facilities to shed light on the relative success of the Quilcene NFH coho salmon program.

Additional tagging will be continued in conjunction with the monitoring program to facilitate evaluation of selective harvest fishery management. All coho salmon not tagged for the monitoring or selective fishery evaluation programs will be fin clipped to support mark-selective

Table 4. Current Quilcene NFH tagging and sampling goals.

Species	Juveniles			Adults		
	Production goal	Mark/tag	Number	Mark/tag sample rate	Scale sample rate	Number of genetic samples
Coho, on-station	400,000	Tag/clip	48,000	50%	n/a	75
		Tag/no clip	48,000	50%	n/a	
		Clip only	304,000	50%	n/a	
Coho, pen transfer	200,000	Tag/clip	45,000	50%	n/a	
		Clip only	155,000	50%	n/a	

harvest opportunity and to meet our commitment as party to the implementation plan in the "Stipulation and Court Order Concerning Co-Management and Mass Marking" (U.S. District Court 1997) and as required by the mass marking law.

Pacific Salmon Commission (PSC) analysts use all of the tag groups discussed above for modeling harvest of hatchery and wild stocks. In this instance, the unclipped, tagged hatchery coho salmon serve as a surrogate for wild coho salmon. No other special studies requiring coded-wire tagging are planned at this time.

Adult return sampling for coded-wire tags will be continued to support data collection requirements for the monitoring and selective fishery evaluation programs.

3.7.3 Coho Salmon Net Pen Transfer - Similar to the on-station release, fish transferred to the Quilcene Bay net pens have been tagged to support our monitoring needs and PSC analysis. Those fish not tagged are fin clipped for subsequent mark-selective harvest.

Transferring coho pre-smolts to Quilcene Bay

Adult sampling for coded-wire tags occurs concurrently with the on-station program returns.

3.7.4 Nuclear DNA Genetic Profile Sampling – All Stocks - Archival tissue samples of summer chum salmon (3 brood years), fall chum salmon (3 brood years), and coho salmon (4 brood years) have been collected since 2001 for subsequent DNA analysis. Data generated from this sampling will be used to assess the ancestries and genetic relationships of these stocks to wild populations and other hatchery stocks. This may also provide valuable information that may contribute to recovery of listed stocks or future management actions to preserve genetic diversity.

3.7.5 Environmental Monitoring - Environmental monitoring is conducted at Service facilities to ensure these facilities meet the requirements of the National Pollution Discharge Elimination System (NPDES) permit and is also used in managing fish health. On a short-term basis, monitoring helps identify when changes to hatchery practices are required. Long-term monitoring provides the ability for our cooperators to quantify water quality impacts resulting from changes in the watershed (e.g., logging, road building and urbanization).

Effluent from the hatchery is monitored weekly for settleable and suspended solids and reported monthly to the EPA. Quilcene NFH easily complies with the limits of its existing NPDES permit. River flows and water temperatures are also recorded daily. The hatchery complies with the discharge requirements as specified by the label for each chemical used as a therapeutant.

3.7.6 Coordination/Communication - Staff from Quilcene NFH, OFHC, and WWFWO Fisheries Division meet twice annually as the Hatchery Evaluation Team (HET). Additional meetings occur as needed and telephone and e-mail communications happen frequently. All subjects regarding hatchery infrastructure, fish production, ecosystem function, harvest management, fish health, mass marking, tagging for evaluation, special studies, plan development including HGMP, CHMP, and HACCP, outreach, and environmental permitting are discussed. Topics needing co-manager involvement are carried forward after internal discussion.

3.7.7 Fish and Egg Transfers - Generally, many fish and egg transfer programs from Quilcene NFH have been reduced or eliminated. Those that remain *(eyed egg transfer to George Adams SFH for Port Gamble Pens and pre-smolt transfer to Quilcene Bay Pens)* were sanctioned by the co-managers in accordance with the Hood Canal Salmon Management Plan. New requests would be handled via the same process.

3.8 Ocean and Freshwater Fisheries Management

3.8.1 Salmon Management Processes - (References: Northwest Indian Fisheries Commission, Pacific Salmon Commission, Pacific Fisheries Management Council).

Pacific salmon migrate as juveniles to feeding grounds in the Pacific Ocean where they grow to adult size and then return to the stream of their birth to reproduce. Their oceanic range is from Alaska to California, and during their migration they are subjected to a number of fisheries which are regulated by a variety of jurisdictions. Mutual cooperation of the governments and fisheries interests involved assures that fish can be caught without damaging the spawning stocks which are needed to perpetuate future year classes of fish. From pre-season planning to post-season data sharing, the governments of the United States, Canada, the states, and the tribes work cooperatively to ensure that the needs of both the resources and those who depend on them are met.

Adult salmon returning to Washington migrate through both U.S. and Canadian waters and are harvested by both countries. The 1985 Pacific Salmon Treaty, with later amendments in 1999, was developed through cooperation of the tribes, state governments, U.S. and Canadian federal governments, and sport and commercial fishing groups, to help fulfill conservation goals and the right of each country to reap the benefit of its own fisheries enhancement efforts.

3.8.2 International Salmon Management - The Pacific Salmon Commission is the body formed by the governments of Canada and the United States to implement the Pacific Salmon Treaty (www.psc.org/pubs/Treaty.pdf). The Commission itself does not regulate the salmon fisheries but provides regulatory advice and recommendations to the two countries and a forum for the two countries to reach agreement on mutual fisheries issues. It has responsibility for all salmon originating in the waters of one country which are subject to interception by the other, and which affect management of the other country's salmon or which biologically affect the stocks of the other country. The PSC is also charged with taking into account the conservation of steelhead while fulfilling its other functions.

The fundamental role of the PSC is first, to conserve Pacific salmon in order to achieve optimum production and second, to divide the harvests so that each country reaps the benefits of its investment in salmon management. The PSC gives both countries a forum through which to resolve difficult salmon management problems.

The PSC itself is a 16-person body with four Commissioners and four alternates each from the United States and Canada, representing the interests of commercial and recreational fisheries as well as federal, state, and tribal governments. Each country has one vote in the Commission. The agreement of both countries is required for any recommendation or decision. Three regional panels, the Southern, the Northern, and the Fraser River, provide technical and regulatory advice to the Commission. Each Panel is made up of no more than six representatives and alternates from each country. Membership reflects a range of governmental and fishing interests.

The Panels provide recommendations and comment on the management of the fisheries in their area of responsibility before and after each season's harvest. Panel recommendations are based on technical data received from a variety of bilateral technical committees on annual fishing plans and regulations and salmon enhancement programs. These committees rely upon information provided by Canadian and United States fishery management agencies. Agreement of both nations is needed for any decision or recommendation to pass to the Commission. The Fraser River Panel is unique in that it also has responsibility for in-season harvest regulation of Fraser River sockeye and pink salmon within a specified area.

The Commission has a variety of tools at hand to achieve its mandate. It may recommend that the countries implement harvest limitations, time and area closures, gear restrictions, or other measures to control harvests. It may also recommend the use of enhancement techniques to strengthen weak runs, mitigate for damage done by logging, mining or dam-building, or for other purposes.

3.8.3 United States Ocean Salmon Management - The Pacific Fishery Management Council (PFMC) is one of eight regional fishery management councils established under the Magnuson Fishery Conservation and Management Act of 1976 and the Sustainable Fisheries Act of 1996, which are now known jointly as the Magnuson-Stevens Fishery Conservation and Management Act. The PFMC develops fishery management plans for salmon, ground fish, and coastal pelagic species in the U.S. Exclusive Economic Zone from 3 miles to 200 miles off the coasts of Washington, Oregon, and California. The North Pacific Management Council is similarly responsible for fisheries off the coast of Alaska. Tribal and state representatives hold seats on the Council and participate on technical committees.

In the PFMC management cycle, a wide range of factors, such as abundance, harvest quotas, and economic impacts are evaluated before an ocean fisheries management plan is submitted to the Secretary of Commerce for final approval and adoption. Fisheries management regimes developed by the tribes and state for waters within three miles of the coast must also be consistent with PFMC plans.

The PFMC process is a cooperative effort involving states, federal agencies, and tribes. The Council relies on well-established state, federal, and tribal management programs and expertise. The staff coordinates an interactive planning process involving technical teams, an independent scientific committee, constituent advisory panels, enforcement officials, legal counsel, management agencies, and the public. Technical teams are composed of biologists and economists from the management entities and are tasked with the preparation of fishery management plans, fishery monitoring, stock assessments, and impact analyses. A strong partnership between the Council and NOAA-Fisheries enhances communication and cooperation in the development and implementation of federal regulations.

Chinook salmon and coho salmon are the predominant species caught and managed under the PFMC's salmon management plan. In odd-numbered years, in cooperation with the PSC's Fraser River Panel, the PFMC may also design special fisheries north of Carroll Island (48° N, approx.) for pink salmon. Sockeye salmon, chum salmon, and steelhead trout are only rarely caught in the PFMC's ocean fisheries.

The salmon fishery management plan specifies the overall salmon management objectives and strategies to be followed by the PFMC and the Secretary of Commerce. The annual management measures (e.g., season length, quotas, bag limits, etc.) may vary within the plan's framework of objectives, depending on the estimated salmon abundance. Two major elements of the plan are fixed annual goals for the number of spawners of the major salmon stocks contributing to ocean fisheries (commonly referred to as spawner escapement goals) and schedules or objectives for allocating the available harvest among the various groups of fishers. The PFMC must also meet the requirements of applicable federal law, such as the Endangered Species Act. The current salmon fishery management plan consists primarily of a base document (the framework plan) implemented in 1984 and subsequent amendments numbered 7 through 12 which have been modified for various management aspects, especially spawner goals and harvest allocations. In 1996, the PFMC completed an editorial update of the plan including the 12 amendments implemented to date.

Each year the PFMC follows a specified pre-season management process to develop the annual salmon management measure recommendations. A detailed schedule outlining the process for the next salmon season is distributed by the PFMC after its November meeting. Public involvement in the process begins in late February with the release of reports documenting the previous ocean salmon fishing season and providing estimates of the expected salmon abundance for the coming season. The reports are followed by a PFMC meeting in early March to establish proposed season options, public hearings on the options in late March, and an early April meeting to adopt the final recommendations in time for implementation on May 1.

To assist in its salmon management determinations, the PFMC maintains a Salmon Technical Team and a Salmon Advisory Sub panel. The Salmon Technical Team consists of six members who have technical expertise in salmon management. The members come from the state,

federal, and tribal fishery management agencies. The team prepares the reports which summarize the previous season, estimate abundance for the coming season, and analyze impacts of the PFMC proposed and final management recommendations and plan amendments when they occur. The Salmon Advisory Sub panel is composed of 17 members who primarily represent the various commercial, recreational, and tribal components of the salmon fishing industry within the PFMC management area as well as a representative of the public at large and the conservation community. The salmon advisors play an important role in developing the PFMC's annual salmon management options in March.

The abundance of salmon is influenced by numerous natural and man-made phenomena and is highly variable. Changes in the ocean environment and meteorological conditions which affect ocean and freshwater survival of salmon are, and always will be, beyond our control. Estimating the effect of these variations on salmon abundance and establishing harvest regimes which complement rather than oppose the natural variation is a constant challenge for PFMC management. Other major challenges involved in salmon management are: imprecise estimates of salmon abundance; determination and coordination of stock impacts on an international, regional and local basis; recovery of species listed under the Endangered Species Act; equitable allocation of the available harvest, and restoration of large areas of freshwater habitat which have been degraded by water diversion, dams, and numerous other man-made impacts.

3.8.4 Washington State Nearshore Salmon Management - Fisheries in Washington's near shore coastal waters (within three miles), Puget Sound, the Strait of Juan de Fuca, and the Strait of Georgia are co-managed by the treaty Indian tribes and WDFW. These co-managers cooperatively shape their harvests according to the court decision rendered in *U.S. v. Washington*, in which the tribes and the state equally share the harvestable surplus of returning salmon. Under the court decision, the co-managers have developed the Puget Sound Salmon Management Plan and the Hood Canal Management Plan. Non-Indian fisheries are managed by WDFW and Indian fisheries are managed by each tribe within its specific, adjudicated "U&A" or usual and accustomed fishing areas.

As described above, the harvest of adult salmon returning to Quilcene NFH is managed sequentially by terms of the Pacific Salmon Treaty (Alaska, Canadian, offshore Washington and Oregon waters), the Magnuson-Stevens Fishery Conservation and Management Act (inshore Washington and Oregon waters), the Puget Sound Salmon Management Plan, and the Hood Canal Management Plan.

Fisheries that typically harvest Quilcene NFH stocks within Hood Canal include: a sport fishery for coho salmon in Quilcene Bay and the Big Quilcene River; a tribal beach seine fishery and a limited all-citizens beach seine fishery for coho salmon in Quilcene Bay; a limited tribal gillnet fishery for coho salmon in Quilcene Bay that becomes less limited in later September after summer chum salmon have entered the spawning grounds. Occasionally, a tribal coho salmon dip net fishery (subsistence and commercial) is also conducted in the Big Quilcene River when return rates are high. Fishery managers in these extreme terminal areas routinely consult with the hatchery staff during the fishing season to assure that adequate numbers of fish return to the hatchery to meet future production needs.

Big Quilcene River sport fishery

3.9 Public Outreach

In 2001, the visitor center and displays were displaced by the office space expansion. Visitor information is currently very limited due to confined space in the entrance vestibule to the office. A new visitor center has been identified for future construction.

The Quilcene NFH partners with local schools to provide learning experiences for students ranging from pre-school to high school ages. The local schools have a standing invitation to participate in scientific sampling and activities at the hatchery. The hatchery also partners with the Service's Regional Office in Portland, Oregon, to provide training opportunities for foreign fisheries professionals as well as students interested in fisheries careers.

3.10 Special Concerns

3.10.1 Planning Issues - The Hood Canal Salmon Management Plan (Point-No-Point Treaty Council et al. 1986), under which the Quilcene NFH program operates, was established as a result of *U.S. v Washington* to provide guidelines for the harvest, protection, rehabilitation, and enhancement of salmon resources originating from or passing through Hood Canal waters from the mouth of Hood Canal southward. It is intended to comply with and address all regional issues required by the Puget Sound Salmon Management Plan (1985) and meet guidelines for regional plans as suggested by the Salmon and Steelhead Conservation and Enhancement Act (P.L. 96-561).

The primary goal of the Hood Canal Salmon Management Plan is to maximize the long term net benefits from the salmon resources in a manner that provides clear policy and technical guidelines, minimizes disagreements, and improves coordination between the parties. The parties to the plan consist of WDFW, the PNPTT, and the Service.

Other regional planning efforts affecting Quilcene NFH include the recovery program for threatened Hood Canal summer chum salmon (WDFW and PNPTT 2000), the Washington Statewide Strategy to Recover Salmon (Washington State Joint Natural Resources Cabinet

1999), and spin-off activities of regional salmon recovery groups such as the Hood Canal Coordinating Council. These planning efforts attempt to address harvest, habitat, hydropower, and hatchery issues that affect salmon recovery in Hood Canal and Puget Sound.

3.10.2 Hatchery Reform - The Hatchery Reform Project of Puget Sound and Coastal Washington has the twin goals of recovering wild salmon and also providing for sustainable fisheries (Long Live the Kings and the Hatchery Scientific Review Group 2000). As part of the hatchery reform project, fish passage protocols at Quilcene NFH were re-assessed to optimize natural and hatchery salmon production in the Quilcene River system (Zajac 2002). A historical review of Quilcene NFH fish production was also completed as part of the hatchery reform project (Kane and Moore 2001) to better understand the genetic makeup of fish reared at Quilcene NFH as well as the hatchery's historical influence on regional salmon production.

The Hatchery Reform Project resulted in hatchery-specific as well as area-wide recommendations regarding fish hatcheries. These recommendations were developed by an independent scientist panel with informational input from various agency personnel.

Recommendations specific to Quilcene included increasing the percentage of jack coho spawned, reducing coho production, eliminating chum production, and continuing mass marking. We have implemented all of these recommendations. An additional recommendation was made to replace the existing Quilcene coho stock with Big Beef Creek stock to alleviate perceived genetic impacts to neighboring wild coho stocks. The Service is cooperatively conducting a genetic profiling study of coho stocks in Hood Canal (Ardren et al. 2006) to provide the best science available to make a decision regarding the appropriate coho salmon stock to use at Quilcene NFH.

3.10.3 Water Use (Drought) - In spring of 2001, an anticipated drought year, we developed options regarding fish releases commensurate with expected declines in water availability for fish culture. The options ranged from the preferred option of an early on-station release of some production to unpreferred options including releases to other watersheds or euthanasia. Fortunately, adequate water was available and no options had to be exercised. The options are still viable with the current production if drought conditions are anticipated in the future (Attachment 8).

3.10.4 Surplus Adult Salmon Distribution - Adults that are surplus to spawning needs and are fit for human consumption are distributed to local tribes for subsistence via a 1982 Cooperative Agreement between the Service and the Bureau of Indian Affairs (Attachment 9), or secondarily to the Bureau of Prisons (Attachment 10) via a 2006 Memorandum of Understanding between the Service and the U.S. Department of Justice.

3.10.5 Land Acquisition/Boundaries - The hatchery owns about 47.4 acres of property near Quilcene, as well as a satellite egg collection facility on leased land in Brinnon at Walcott Slough. Land has been acquired to protect domestic water source, to control land use and access around water intake structures, and to protect water quality for egg incubation and early rearing.

A comprehensive land acquisition plan is being developed to identify needs at the hatchery and to protect against threats posed by nearby development. Potential threats to hatchery operations from development include leaching of chemicals and fertilizers and leaking septic systems.

3.10.6 Culvert Assessment Project - In 2003, the WWFWO received Fisheries Operations Needs System (FONS) funding to assess culverts on federal property (fish hatcheries and refuges). The assessment (Tschaekofske et al. 2004) identified barriers to both adult and juvenile salmonids and included hatchery structures such as intake dams and weirs as well as culverts. Two Quilcene NFH structures, both on Penny Creek, were identified as complete year-round barriers. A feasibility study has been proposed to assess the biological potential of allowing fish access up Penny Creek and construction alternatives (Attachment 11).

3.10.7 Impacts to Aquatic Resources and Actions to Recover Listed and Depressed Populations - All hatcheries must consider their potential for adversely impacting the aquatic community. To help assess potential impacts, the Service has developed a HGMP for Quilcene NFH. This management plan was compiled to assess our program and meet Endangered Species Act requirements identified by NOAA-Fisheries. The plan was originally prepared in 1999 and was revised in 2005. The plan assesses the potential impacts from hatchery operations including; water withdrawal and effluent discharge, broodstock collection and mating, juvenile fish health and releases, ecological interactions, carcass disposition, and monitoring and evaluation. We expect that NOAA-Fisheries will concur that Quilcene NFH operations will not jeopardize listed species fish, as they have in the past.

3.10.8 Endangered Species Act and Species Recovery - All U.S. fisheries must be managed to address impacts to salmon stocks listed under the Endangered Species Act, which in the case of salmon is administered by NOAA-Fisheries. Bull trout are administered by the US Fish and Wildlife Service.

Hood Canal summer chum salmon were listed as “threatened” in March 1999. The co-managers recognized the weakened stock status in 1992 and began implementing coho salmon harvest methods that reduce fishery impacts to summer chum salmon in Hood Canal. These included restricted gill net seasons and institution of a selective beach seine harvest in Quilcene Bay, where coho salmon and summer chum salmon overlap in their return timing. Under the Summer Chum Salmon Conservation Initiative (WDFW and Point-No-Point Treaty Council 2000), cumulative harvest impacts to Hood Canal summer chum salmon from all fisheries, including Canada, are targeted to an average expected exploitation rate of 10.9%, in contrast to the 1980-1991 average exploitation rate of 57.1%.

The development of the summer chum initiative has been instrumental in NOAA-Fisheries’ development of biological opinions and ESA section 4(d) rules regarding coho salmon harvest impacts on summer chum salmon and regarding previous artificial production of summer chum salmon at Quilcene NFH.

The Coastal-Puget Sound Bull Trout distinct population segment was listed as “threatened” in November, 1999. This species is very rarely found in the Big Quilcene River, likely occurring only as adults in the act of foraging on smaller fish.

3.10.9 Fish Passage and Ladder Management – Adult coho are passed upstream by transport in a tank truck because the current weir bypass ladder is blocked by gravel accumulation.

CHAPTER 4. QUILCENE NFH ACTION ITEMS

The following tasks complement the U.S. Fish and Wildlife Service *Fisheries Program Vision for the Future* (http://www.fws.gov/fisheries/caf/Vision.htm) (USFWS 2002), the *Pacific Region: Fisheries Program Strategic Plan* (USFWS 2004) (http://www.fws.gov/pacific//Fisheries/Docs/Pacific%20Region%20Step%20Down%20Plan.pdf) and other co-manager agreements affecting northern Hood Canal. All of the Service Vision focus areas (Chapter 1) are encompassed in the Quilcene NFH goals, objectives, and tasks. Specific task references to the Regional Fisheries Program Strategic Plan are referenced in the brackets following the tasks below. The Regional Strategic Plan tasks also relate to tasks in the National Service Vision, which in turn relates to Department of Interior performance measures.

4.1 Hatchery Goals, Objectives, and Tasks

Goal 1: Support recovery and conservation of local endangered and threatened species and species at risk. [3.1]

Objective 1.1: Successfully maintain a summer chum salmon monitoring program at Quilcene NFH in accordance with the co-managers' Summer Chum Salmon Conservation Initiative (CI) and NOAA-Fisheries' Biological Opinion. [3.1.5]

Task 1.1.1: Biosample and mark sample returning adults. [3.1.4]

Task 1.1.2: Communicate program planning and progress annually within the hatchery evaluation team and to co-managers and cooperators under the CI. [5.2.8]

Objective 1.2: Minimize negative impacts to ESA-listed and other native species, their habitats, and the environment by implementing state-of-the-art fish culture technology, hatchery operation, and hatchery maintenance. [5.2.1]

Task 1.2.1: Update completed HGMPs to address listed species. [5.2.4]

Task 1.2.2: Release only juvenile fish that are ready to migrate downstream (smolts), in the appropriate timeframes to avoid impacting listed or vulnerable species. [3.2.4]

Task 1.2.3: Mass mark all coho salmon to identify them from naturally produced fish. [3.2.4, 5.2.2, 5.2.6]

Task 1.2.4: Upgrade the hatchery intakes to meet NOAA-Fisheries screening criteria for fish in the Big Quilcene River (unfunded). [10.2.7]

Task 1.2.5: Manage the hatchery weir and ladder within acceptable impacts to listed and native fish. [5.2.8]

Task 1.2.6: Implement a Hazard Analysis and Critical Control Point (HACCP) plan. (Attachment 5) [4.1.2]

Task 1.2.7: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health. [10.4.1, 10.4.2]

Task 1.2.8: Comply with all environmental permit (including ESA consultation) requirements for hatchery operation, construction, and maintenance. [10.4.1, 10.4.2]

Objective 1.3: Seek other opportunities to contribute to the recovery and conservation of ESA-listed species and other species at risk. [5.1.4]

Task 1.3.1: Communicate with all partners and forums in order to stay informed of other recovery and conservation needs that may be accommodated at Quilcene NFH. [1.4, 5.2.8]

Task 1.3.2: Develop processes for isolated steelhead incubation to accommodate the developing Hood Canal steelhead supplementation study (NOAA-Fisheries lead). [1.4, 5.2.8]

Goal 2: Assure that hatchery operations support the Hood Canal Salmon Management Plan, the Puget Sound Salmon Management Plan (*U.S. v Washington*), and Pacific Salmon Treaty objectives. [5.1]

Objective 2.1: Collect sufficient coho salmon brood stock to produce 400,000 smolts for on-station release into the Big Quilcene River, 200,000 pre-smolts for the Quilcene Bay net pens, and 450,000 eyed eggs for the Port Gamble net pen program. [6.2.1, 8.2.3]

Task 2.1.1: Collect and successfully hold about 600 pairs of coho to maturity.

Objective 2.2: Contribute to a meaningful harvest for sport, tribal, and commercial fisheries from Canada to the Big Quilcene River (achieve a 10-year-average survival from smolt to adult of 5.0% for coho salmon, harvest plus escapement). [6.1.1, 6.2.1]

Task 2.2.1: Work with states and tribes to establish meaningful fisheries (through *U.S. v. Washington* and Pacific Salmon Commission forums). [5.1.1, 5.1.4]

Task 2.2.2: Mass mark juvenile hatchery coho salmon to facilitate harvest and related conservation and assessment efforts for hatchery, wild, and ESA-listed stocks. [3.2.4]

Objective 2.3: Meet tribal trust responsibilities. [8.1, 8.2, 8.3]

Task 2.3.1: Follow pertinent Laws, Agreements, Policies, and Executive Orders on consultation and coordination with Native American Tribal Governments. [8.1, 8.2, 8.3]

Objective 2.4: Maximize survival at all life stages by working with the appropriate fish health center to maintain a comprehensive fish health program, focusing on prevention of diseases rather than treatment. [5.2.7]

Task 2.4.1: Maintain hatchery operations that are consistent with the Service Manual (Part 713); State of Washington, Aquaculture and Disease Control (RCW 75.58); and the Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Any exceptions to this task would be negotiated on a case-by-case basis with the fish health co-managers. [5.2.7]

Objective 2.5: Communicate and coordinate effectively with co-managers in Hood Canal. [2.3, 5.2.8]

Task 2.5.1: Participate in *U.S. v Washington* production planning processes. [5.1.4, 5.2.8]

Task 2.5.2: Hold semi-annual Hatchery Evaluation Team meetings to plan and review progress toward meeting hatchery goals.

Objective 2.6: Ensure goals are achieved by working with the appropriate Fishery Resource Office to conduct monitoring and evaluation. [3.2.4]

Task 2.6.1: Coded-wire-tag production lots of coho salmon for Pacific Salmon Treaty indicator stock purposes. [5.2.2]

Task 2.6.2: Double-index tag and mass mark production lots of coho salmon to evaluate mark-selective fisheries. [5.2.2, 5.2.6]

Task 2.6.3: Biosample and mark sample returning adults. [5.2.3]

Task 2.6.4: Produce an annual report on stock assessment, survival, fish health, and fisheries contribution. [2.3.2]

Task 2.6.5: Provide data as needed for co-managers and for internal management needs. [5.2.8]

Goal 3: Promote understanding, participation, and support of Service and Quilcene NFH programs.

Objective 3.1: Increase awareness of Quilcene NFH programs. [2.1.4]

Task 3.1.1: Coordinate with state, other federal, tribal and local information/public offices to incorporate information about Quilcene NFH. [1.4, 2.1.4]

Task 3.1.2: Facilitate interagency cooperation with existing and new programs in fisheries management [5.2.8]

Task 3.1.3: Coordinate with other federal offices to participate in special events, such as National Fishing and Boating Week. [6.2.2]

Task 3.1.4: Interact with Service, tribal, other federal agencies, Fisheries outreach coordinators and actively seek to integrate Fisheries outreach activities with the Regional and National Outreach Strategies. [2.1.4]

Task 3.1.5: Distribute the annual Quilcene NFH Focus Report (prepared by the WWFWO) to the public and to our cooperators. [2.3.2]

Objective 3.2: Provide information and education about Service programs and Quilcene NFH to internal and external audiences. [2.3.2, 3.1.7, 6.3]

Task 3.2.1: Continue existing and develop new cooperative agreements and partnerships with public, private, and home school groups. [1.2]

Task 3.2.2: Create and maintain a website for the Quilcene NFH to inform cyber-visitors of the hatchery's programs and history, and to provide general information about the hatchery. [2.3.1]

Task 3.2.3: Develop a volunteer program to give tours, answer questions, and disseminate general information. [2.1.4]

Task 3.2.4: Develop a strong working relationship with the local media (newspaper, radio, and other Puget Sound area publications) and provide news releases and articles regarding agency issues and station activities. [2.1.4]

Task 3.2.5: Increase public use of the hatchery facilities by inviting special interest groups to tour the hatchery. [2.1.4]

Task 3.2.6: Loan Service-developed educational material to teachers (fish kit, migratory bird kit). [2.1.4]

Goal 4: Support the principles of hatchery reform.

Objective 4.1: Maintain scientifically defensible production programs. [5.2.1]

Task 4.1.1: Increase the use of coho jacks in spawning to 10% of the males spawned. [5.2.1]

Task 4.1.2: Reduce the number of unharvested adults that exceed escapement needs or may stray to nearby streams.

Sub-Task 4.1.2.1: Work with the co-managers (WDFW, PNPTC, Hood Canal U&A Tribes) to expand harvest on returning adults OR to identify reductions in production that do not jeopardize harvest opportunities. [5.1.4, 5.2.8, 8.2.2]

Task 4.1.3: Investigate back-selection of coho salmon for later return timing to temporally separate returning summer chum and coho salmon adults. [3.2.4, 5.2.8]

Objective 4.2: Use informed decision making to manage the hatchery program. [5.1.5]

Task 4.2.1: Measure the genetic profiles of northern Hood Canal coho populations to assess the impacts of Quilcene stock coho strays on natural coho. [3.2.1, 3.2.4, 5.2.8, 9.3.2]

Task 4.2.2: Work with the co-managers (WDFW, PNPTC, Hood Canal U&A Tribes) to review results of recent straying and genetics studies, working towards a decision on future broodstock selection at Quilcene NFH. [5.1.4, 5.2.9, 9.3.2]

CHAPTER 5. IMPLEMENTATION

5.1 Budget Overview

Quilcene NFH operational funds come solely from USFWS base funding (Fisheries Sub activity 1311, and Maintenance 1313). The Fisheries Sub activity 1311 fund also supports fish production evaluations (tagging, biosampling, planning, coordination, etc.) and fish health evaluations conducted at Quilcene NFH by the WWFWO and the OFHC, respectively.

The fiscal year runs from October 1 through September 30. The budget is typically not allocated to the field stations until six months into the fiscal year.

5.1.1 Budget - Gasoline costs have risen dramatically and its effect increases costs of equipment, supplies, travel, maintenance, contracts, and operation of the hatchery.

Assistant hatchery manger Larry Telles is a member of the "Columbia River Hatchery Review Team". This team is reviewing operations of all Columbia River hatcheries, owned or operated by FWS. The review process will take at least three years to complete and involves significant travel as well as taking Larry away from the hatchery crew. To date, the hatchery has covered the additional costs of this special assignment.

5.1.2 Fisheries Operational Needs System (FONS) - FONS was established in 1999 as a planning, budgeting, and communication tool to enhance identification of funding needs for the Fisheries Program. FONS data are used regularly in budget justifications presented to the Department of Interior, Office of Management and Budget, and Congress. FONS data are also used to produce brochures and other write-ups as outreach tools. See Attachment 11 for a listing of proposed FONS projects relating to Quilcene NFH.

5.1.3 Maintenance Management System (MMS) - The Maintenance Management System (MMS) was established in 1982 to enhance Service-wide efforts in planning and budgeting for maintenance activities. The MMS program includes guidance on property inventory, maintenance standards, inspection procedures, cost estimating, work control and scheduling, maintenance planning, and budgeting. See Attachment 12 for a listing of high-priority MMS projects proposed for Quilcene NFH. In 2005, MMS was augmented by the addition of real property assets to the system, to become the Service Asset Maintenance Management System (SAMMS).

5.1.4 Five-Year Construction Plan - Fisheries construction projects are entered into the RMIS, the same web-based database, developed for Refuges, as is used for the Real Property Inventory (RPI). Scores and Regional priorities are assigned and the information is used at the Washington Office to develop a Five-Year Construction Plan. This plan, after approval by the Department of Interior and OMB, is submitted as part of the Service Budget to Congress. The out-years of this plan are subject to revision each year. Construction funds are similar to MMS funds but are reserved for new construction and maintenance to existing buildings above $500,000.

5.1.5 Five-Year Maintenance Plan - The Deferred Maintenance projects entered into the database are prioritized by the WO, at least partially, based on the priority established by the Field Office and Regional Office priorities. This plan is reviewed by the Department of Interior and the approved plan is part of the basis of our MMS budget request to Congress (see previous discussion on MMS).

5.1.6 ESA Compliance and Needs - The hatchery recently completed a successful summer chum salmon supplementation program, which was conducted in consultation with NOAA-Fisheries (Section 7 Endangered Species Act Consultation No. F/NWR/1999/01863; Biological Opinion on Artificial Propagation in the Hood Canal and Eastern Strait of Juan de Fuca Regions of Washington State, dated March 4, 2002). The hatchery currently has a HGMP filed with NOAA-Fisheries for inclusion in the upcoming Environmental Impact Statement process for hatchery production in Puget Sound and consideration of ESA Section 4(d) limits for incidental impacts to summer chum salmon and Chinook salmon.

5.2 Service and Station Guidance

5.2.1 Quarters and Required On-Station Housing – Government-owned residences are available to employees to rent. The determination of whether an employee must occupy government furnished quarters as a condition of employment is made on a station-by-station, position-by-position basis. In making a determination, supervisors consider the dependability of the water supply, adequacy of the alarm and call back systems, response time needed to take emergency corrective actions, and the adequacy of the security provided to protect fish, facilities, and equipment.

More information can be found at the following websites:

- http://www.doi.gov/pam/qmhbold.html
- http://www.fws.gov/policy/371fw1.html

5.2.2 Overtime/Compensatory Time/Standby - Regulations governing overtime, compensatory time, and standby are described in the U. S. Fish and Wildlife Service Directive 225FW7, EIB 01-03. This can be found at the Service Policy page:

- http://www.fws.gov/policy/ or
- If you have access to the Service Intranet, it can be found at https://intranet.fws.gov/region1/aba/hr/

5.2.3 Distribution of Surplus Fish/Eggs - It is important to first consider all possible uses of hatchery fish that are consistent with the Service Mission. Surplus fish must be disposed of using prescribed government contracting procedures, agreements, and tribal responsibilities. Furthermore, Quilcene NFH must comply with Service and Food and Drug Administration (FDA) policies related to the disposition of carcasses and parts that have been treated with chemicals making them unfit for human consumption.

Additional guidance was provided in a July 2001 memorandum from the Regional Director (Attachment 13) regarding personal use of carcasses. The guidance states: "Live fish entering a National Fish Hatchery (Hatchery), whole fish carcasses or their parts, are Government property and cannot be converted for personal use, even temporarily on loan. Misuse of Government property may result in disciplinary action ranging from a written reprimand to removal from the Service."

5.2.4 Drugs and Anesthetics - Guidance on the use of anesthetics, drugs, and other chemicals was provided in a November 9, 2000 memorandum from the Assistant Regional Director for Fisheries in Region 1 (Attachment 14). Hatcheries and other Fisheries offices within Region 1 may at times have legitimate and necessary reasons to use certain drugs and chemicals to achieve their goals and complete the mission and objectives of the Service. During the capture, rearing, or monitoring of fish species, several drugs and chemicals are used for anesthesia, disease treatments, or to increase the survival of the animals. Some of these compounds are already registered and labeled for fisheries use. Others may be legally used under the prescription and supervision of a veterinarian, or within the protocols of an existing Investigational New Animal Drug (INAD) exemption permit issued by the FDA. The Service has existing correspondence from the FDA concerning the use of compounds in the recovery of threatened and endangered species, but there are strict considerations and limits even in those situations. Region 1, working closely with the National INAD Office and through appropriate consultation with FDA, will fully comply with all regulations and agreements for the use of aquatic drugs and chemicals. The inappropriate use of compounds on fish or aquatic animals intended for human or animal consumption is prohibited.

5.2.5 Employee Training - Regulations governing employee training are described in the FWS Administrative Manual. Career development is discussed starting in Part 230 FW of the Manual.

5.3 Service Required Planning Documents

Daily operations of Quilcene NFH are guided by a number of plans and reports designed to promote health and safety, station development, employee training, address emergency situations, and other actions. Some of the more significant ones are described here:

5.3.1 Safety and Health Plan - The Safety Plan (program) at Quilcene NFH provides safe working conditions for employees as well as visitor safety. Monthly safety meetings are conducted to discuss safety issues, conduct safety training, and implement safety corrections. First Aid and CPR training are offered to all personnel. Annual hearing testing of all employees was initiated in 2004.

5.3.2 Automatic External Defibrillator (AED) Program - Quilcene NFH has an AED program that is overseen by a doctor and coordinated with the local volunteer fire department. The AED is located in the hatchery building lab and location noted with local Sheriff's department. The AED unit is routinely serviced as required and station personnel are given quarterly refresher training on AED use from the local volunteer fire department (Jefferson County Fire District #2).

5.3.3 Fire Management Plan - Department and Service policy require that "every area with burnable vegetation must have an approved Fire Management Plan" and field stations cannot conduct prescribed fire operations, including trash burning, without an approved Fire Management Plan that includes such activities. All Service facilities developed plans and had them approved in FY 2001, but they must be amended before any controlled burning can be conducted.

5.3.4 Radio Frequency Use - In FY 2005, a Memorandum of Understanding (MOU) was signed by the U.S. Forest Service and Quilcene NFH. This MOU allows Quilcene NFH to use the Forest Service radio frequencies and radio repeaters to extend the Quilcene NFH's radio coverage to conduct business and in case of emergencies. Quilcene NFH does have a dedicated frequency for alarms but, because of the location, radio reception is limited.

5.3.5 Integrated Pest Management Plan - It is Service policy to eliminate unnecessary use of pesticides by implementing integrated pest management techniques and by selecting crops and other vegetation that are beneficial to fish and wildlife but do not require pesticides. The ultimate goal is to eliminate pesticide use on Service lands and facilities and to encourage pest management programs that benefit trust resources and provide long-term environmentally sound solutions to pest management problems on sites which are off Service lands (Attachment 15).

When pesticides are used, they must be part of a pest management program that includes strategies to reduce and eventually eliminate their use. The program must be set forth in an Integrated Pest Management Plan which will be a part of the Comprehensive Hatchery Management Plan and must include consideration of target specificity of the pesticide (insecticide, fungicide, herbicide, etc.), risk to nontarget organisms, incidental reduction of food resources for trust species, persistence, control and prevention of the spread of fish and wildlife diseases, and other environmental hazards.

Land management practices must have high value for fish and wildlife resources, not encourage the exposure to pathogens or development of disease vectors that affect fish or wildlife resources, and they must utilize minimal or no hazardous chemicals. Internal endangered species review, including Endangered Species Act Section 7 consultations, must be completed for all pest management activities that may affect threatened or endangered species.

Service personnel must be trained in integrated pest management. Those personnel who apply pesticides on Service lands must comply with the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act and the Endangered Species Act, Department and Service policy and other applicable laws and regulations. All pesticides must be registered and may only be used in accordance with the pesticide label. Leftover pesticides, rinse water, and empty containers must be disposed of properly. All personnel involved with integrated pest management on and off Service lands must participate in medical surveillance on an annual basis. This program is paid for by the Service from the Field Station budget. All pesticides

labeled as "Restricted" and "Non-restricted Use" must be applied under the supervision of a certified Pesticide Applicator who holds a current and applicable State certification.

All proposed uses of pesticides and biological control agents, in quantities greater than general household use, on Service lands, facilities or in Service-funded projects will undergo review at the Regional and, if required, at the Departmental level.

5.3.6 Station Development Plan - A Station Development Plan is used to identify future construction needs of the hatchery. It attempts to list needs of the station for the next six to ten years. The Station Development Plan is used to inventory and assess existing resources, identify needs in relationship to program objectives; incorporate clear, comprehensive statements of the rationale for proposed developments; and provide conceptual, budget level, cost estimates, and descriptions for proposed developments.

Quilcene NFH's Station Development Plan is being updated. Although the plan is not completed, several items are being identified. These items are:

1. Rehabilitate adult fish handling, fish lifting, egg collection, sampling, and viewing area. The current method of lifting fish out of holding area is unsafe for employees. Fish are handled several times in the task of fish spawning and processing. This process of handling fish can cause injury to employees. This is listed as an MMS project.

2. Electric fish weir needs rehabilitation. Concrete has eroded 4 to 5 inches in some areas and has washed out the electrodes. A temporary repair of replacing electrodes with stranded cable has lasted several years. A study on the Big Quilcene River (from the U.S. Highway 101 Bridge to the hatchery water intakes) recommends creating a notch on the west side of the weir for fish passage during low flows, demolition and replacement of the bottom of the concrete weir, and replacement of the electrodes.

5.3.7 Monitoring and Evaluation Plan - Monitoring and evaluation of production programs are outlined in the HGMP which can be found at the hatchery, the WWFWO, or through the Fishery Program Office in Portland. A more detailed discussion of this activity can be found in Chapter 3.

5.3.8 Continuity of Operation Plan - The Continuity of Operations Plan provides guidance for Quilcene NFH staff to ensure that essential operations and activities continue during and after an emergency situation. The plan is developed in accordance with DOI, MRPS Bulletin 98-01, Continuity of Operations Planning - Guidance and Schedules, dated March 27, 1998, and 380 DM 6, Vital Records Program. This plan is current and located at the hatchery in the administrative files.

5.3.9 Spill Prevention, Control, and Counter Measure Plan (SPCC) - An SPCC is prepared in accordance with the provisions of Title 40 of the Code of Federal Regulations, Part 112. An SPCC plan establishes procedures, methods, and equipment used at the Quilcene NFH to comply with EPA oil spill prevention control and countermeasures standards; and inspection reporting, training, and record keeping requirements.

5.3.10 Outreach Plan - An outreach plan is under development which describes the hatchery's strategy for telling the Service, Quilcene NFH, and the western Washington resource story to the public. Further, this plan describes outreach tools and facilities needed to implement this strategy. The plan should be cited when describing unmet outreach needs in the FONS database (see Fish and Wildlife Service Budgeting Process). The FONS, MMS, SAMMS, and Accomplishment Modules will hopefully address the budgetary shortfalls of the past. In 2001, the visitor center and displays were replaced with expanded offices. Visitor information is currently very limited. A new visitor center has been identified for future construction.

5.3.11 National Pollution Discharge Elimination System (NPDES) - Quilcene NFH is authorized to discharge effluent under NPDES permit number WA-000187-2. The permit is issued for a five year period. The current permit has lapsed, and a renewal application has been submitted

5.3.12 Hazardous Materials - Quilcene NFH is in compliance with all current hazardous material storage, handling, and spill prevention methods and procedures.

5.3.13 Investigative New Animal Drugs (INAD) - No drugs requiring an INAD use permit have been used in recent years. Prophylactic treatments with erythromycin to combat bacterial kidney disease have been discontinued pending demonstrated need such as a BKD epizootic. Should erythromycin treatment become necessary, all INAD procedures will be followed.

5.3.14 Hazard Analysis and Critical Control Point (HACCP) Plan - A Quilcene NFH HACCP plan was written in 2004 to reduce the risk of spreading specific fish pathogens. The plan was submitted to the Regional Office and is posted on the National HACCP web site (www.HACCP-NRM.org).

5.4 Monitoring and Reporting

5.4.1 Fisheries Information System (FIS) - The Fisheries Information System (FIS) is a computer-based system containing several modules: Fisheries Operating Needs System (FONS); Maintenance Management System (MMS); Fish Distribution Module; Egg Distribution Module; and an Accomplishment Module. To address budgetary needs, the FONS, Accomplishment Module, and MMS are used to identify, plan, schedule, and justify budget needs for the field station. The Fish Distribution and Egg Distribution Modules are used to identify work done with any fish or egg distribution from the station.

Several methods have been used to try to ease Quilcene NFH's tight budget: Charging the manager's time to construction contracts while acting as an inspector on large contracts; allowing qualified/trained employees to temporarily fight fires (use of Fire funds in lieu of station funds); eliminating weekend duty**;** delaying maintenance of facility; and eliminating outreach activities. Although these strategies have helped ease budget limitations, it remains to be seen how well the FIS system functions to address the station's budgetary needs.

5.4.2 Fisheries Operational Needs System (FONS) - FONS was described earlier in this Chapter under "Fish and Wildlife Service Budgeting Process". This database is available through the hatchery or the Fisheries Program Regional Office in Portland.

5.4.3 Accomplishment Module - The Fisheries Accomplishment Module was established as a planning, budgeting, and communication tool to enhance identification of Fisheries Program accomplishments. These data are used in budget documents presented to the Department of Interior, OMB, and Congress. The data structure is a parallel of the FONS Module data structure (see previous Fish and Wildlife Service Budgeting Process). This module is used to describe all accomplishments, regardless of funding source. This database is available through the hatchery or the Fisheries Program Regional Office in Portland.

5.4.4 Fish and Egg Distribution - This information is used in the Fish and Egg Distribution Report. The report describes the mission of the National Fish Hatchery System, a component of the Fisheries Program of the Service, and its varied accomplishments. The report contains detailed information regarding species, numbers, and pounds of fish produced. It also describes the general purpose of the production program and if it involves listed species. Copies of the report can be obtained by writing the Division of Fish Hatcheries, U. S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Room 810, Arlington, Virginia 22203.

5.4.5 Maintenance Management System (MMS) - MMS was described earlier in this Chapter under "5.1.3 Budget Overview." This database is available through the hatchery or the Fisheries Program Regional Office in Portland.

5.4.6 Real Property Inventory (RPI) - The RPI provides an annual update on Service "real property" (anything fixed to the ground or a building). The RPI uses a web-based database, called RMIS – Resource Management Information System. This method of updating the RPI database is expected to continue until converted to SAMMS, which is also a web-based database.

5.4.7 Service Asset Maintenance Management System (SAMMS) - SAMMS was implemented in 2005 to improve accountability of the Service. Each piece of "real property" (buildings, pipelines, structures) has a unique SAMMS number. Any maintenance (time and costs) performed on real property and any maintenance on "controlled property" (vehicles, trailers, laptop computer, guns) can be tracked (cost, employee expenses, time, vendor information, part numbers, dates, etc.). SAMMS is a web-based system that can be related to the MMS and can help identify maintenance needs as well as track maintenance expenditures.

5.4.8 Fisheries Resource Evaluation Database (FRED) - This database is used at Olympic Peninsula National Fish Hatcheries to record information related to hatchery operations, marking and tagging, juvenile releases, adult returns, etc. FRED is also useful in providing summary reports of this data. The utility and purpose of this database is described in greater detail in Chapter 3 under Monitoring, Evaluation and Coordination. FRED is maintained at the Western Washington Fish and Wildlife Office, Division of Fisheries, 510 Desmond Drive, Lacey, WA 98503.

5.4.9 Energy Use Report - This is an annual report that summarizes electricity, heating and cooling energy, and gasoline used at the hatchery.

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GLOSSARY

AFS	American Fisheries Society
ANS	Aquatic Nuisance Species
BKD	Bacterial Kidney Disease
CFS	Cubic feet per second
CHMP	Comprehensive Hatchery Management Plan
CWT	Coded-wire tag
DI	Density Index, total weight in pounds/[(total volume in cubic feet) * (fish length in inches)]
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FHB	Fish Health Biologist
FHC	Fish Health Center
FI	Flow Index, total weight in pounds/[(total flow in cubic feet per second) * (fish length in inches)]
FIS	Fisheries Information System (FWS)
FONS	Fisheries Operating Needs System (FWS)
FRED	Fisheries Resource Evaluation Database (FWS)
FWS	U.S. Fish and Wildlife Service
GPM	Gallons per Minute
HACCP	Hazard Analysis and Critical control Point
HET	Hatchery Evaluation Team
HGMP	Hatchery and Genetic Management Plan
HSRG	Hatchery Scientific Review Group
IHNV	Infectious Hematopoetic Necrosis Virus
INAD	Investigational New Animal Drug
MMS	Maintenance Management System (FWS)
NIFC	Northwest Indian Fish Commission
NFH	National Fish Hatchery

NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System (EPA)
OFHC	Olympia Fish Health Center (FWS), Olympia, WA
OMB	U.S. Office of Management and Budget
PFMC	Pacific Fisheries Management Council
PNPTT	Point No Point Treaty Tribes
PPM	Parts per million
PSC	Pacific Salmon Commission
RM	River Mile
SAMMS	Service Asset Maintenance Management System (FWS)
SERVICE	U.S. Fish and Wildlife Service
U&A	"Usual and Accustomed" – describes the nexus of historic and current tribal harvest activity and reserved interest in a geographic area
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WWFWO	Western Washington Fish and Wildlife Office (FWS), Lacey, WA

ATTACHMENT 1: Historical Background - National Fish Hatcheries in Region 1

Station	Year Established	Final Year	Disposition
McCloud River, CA	1872	1882	Closed
Crooks Creek, CA	1879	1887	Moved to McCloud River, CA
Baird (formerly McCloud River), CA	1888	1937	Transferred to Bureau of Reclamation
Clackamas, OR	1888	1943	Transferred to State of Oregon
Fort Gaston, CA	1889	1898	Replaced by Willamette Falls, OR
Korbel, CA	1893	1896	Closed
Redwood Lake, CA	1893	1898	Closed
Sandy River, OR	1895	1925	Closed
Battle Creek, CA	1896	1946	Closed
Olema (Bear Valley), CA	1897	1898	Closed
Salmon River, OR	1897	1900	Transferred to State of Oregon
Upper Clackamas, OR	1897	1931	Transferred to State of Oregon
Rogue River, OR	1897	1932	Closed
Mill Creek, CA	1898	1948	Transferred to FWS Division of Research
Little White Salmon, WA	1898	-----	Operating
Willamette Falls, OR	1899	1942	Closed
Baker Lake, WA	1899	1942	Transferred to US Forest Service
Spring Creek, WA	1901	-----	Operating
Grants Pass, OR	1904	1906	Moved to Applegate Creek, OR
Phinney Creek, WA	1907	1918	Closed
Applegate, OR	1907	1959	Transferred to FWS Division of Research
Cazadero, OR	1908	1913	Closed
Illabot Creek, WA	1909	1927	Closed
Duckabush, WA	1911	1943	Transferred to US Forest Service
Quilcene, WA	1911	-----	Operating
Darrington, WA	1912	1919	Closed
Brinnon, WA	1913	1923	Closed - egg collection
Sultan, WA	1913	1933	Closed
Birdsview, WA	1913	1947	Transferred to State of Washington
Day Creek, WA	1914	1919	Closed
Quinault (Old), WA	1914	1947	Transferred to US Forest Service
St. Helens, OR	1917	1919	Closed
Paris, ID	1918	1921	Closed
Washougal River, WA	1919	1923	Closed
Salmon, ID	1921	1946	Transferred to Bureau of Land Management

Station	Year Established	Final Year	Disposition
Phalon, WA	1922	*	Authorized, but never operated
Snake River, OR	1924	1925	Moved to Salmon, ID
Ozette, WA	1926	1927	Closed
Wind River, WA	1926	1936	Transferred to State of Washington
Mt. Rainer, WA	1931	1942	Transferred to National Park Service
Hagerman, ID	1931	-----	Operating
Butte Falls, OR	1932	1943	Transferred ½ to State of Oregon; ½ to Bureau of Reclamation
Deschutes, OR	1932	*	Authorized, but never operated
Spokane, WA	1935	1942	Transferred to State of Washington
Yakima Fish Screen, WA	1935	1986	Closed
Delph Creek (Estacada), OR	1936	1954	Transferred to State of Oregon
Carson, WA	1937	-----	Operating
Leavenworth, WA	1938	-----	Operating
Clark Fork, ID	1939	1942	Transferred to State of Idaho
Sun Valley, ID	1940	1941	Closed
Warm River, ID	1940	1951	Transferred to State of Idaho
Entiat, WA	1940	-----	Operating
Winthrop, WA	1940	-----	Operating
Coleman, CA	1942	-----	Operating
Willard, WA	1951	-----	Operating
Eagle Creek, OR	1953	-----	Operating
Abernathy, WA	1957	-----	Operating
Lahontan, NV	1964	-----	Operating
Tehama-Colusa Spawning Channels, CA	1967	1989	Caretaker status
Quinault, WA	1969	-----	Operating
Dworshak, ID	1969	-----	Operating
Kooskia, ID	1970	-----	Operating
Marble Bluff Fishway, NV	1974	-----	Operating
Warm Springs, OR	1974	-----	Operating
Makah, WA	1981		Operating
Nisqually, WA	1991	-----	Operating
Livingston Stone, CA	1992	-----	Operating

ATTACHMENT 2: Statutory Mandates and Authorities

General Authorizations

- Anadromous Fish Conservation Act, as amended (16 U.S.C. 757a-757f)
- Department of Transportation Act (16 U.S.C. 1653f)
- Estuary Protection Act (16 U.S.C. 1221-1226)
- Federal Aid in Sport Fish Restoration Act of August 9, 1950, as amended (16 U.S.C. 777k)
- Federal Water Pollution Control Act Amendments, as amended (33 U.S.C. 1251-1365, 1281-1292, 1311-1328, 1341-1345, 1361-1376)
- Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742a-742j)
- Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901-2911)
- Indian Self-Determination and Education Assistance Act of 1976 (25 U.S.C. 450-450n)
- Magnuson Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801-1882)
- National Aquaculture Act of 1980, as amended (16 U.S.C. 2801-2810)
- Reorganization Plan No. 4 of 1970 (5 U.S.C. Appendix)
- Rivers and Harbors Act of 1899, as amended (33 U.S.C. 401 et seq.)
- Recreation Use of Conservation Areas Act (16 U.S.C. 460k-460k-4)
- Sikes Act, as amended (16 U.S.C. 670a-670o)
- Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. 1001-1009)
- Code of Federal Regulation, Wildlife and Fisheries, Title 50, Parts 1 to 199
- Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 stat. 884) as amended
- Federal Power Act (16 U.S.C. 791-828c; Chapter 285, June 10, 1920; 41 Stat. 1063) as amended
- Federal Water Project Recreation Act (16 U.S.C. 460 (L) (12) - 460 (L) (21); P.L. 89-72
- Fish and Wildlife Coordination Act (16 U.S.C. 661-667e; 48 Stat. 401) as amended
- Fish and Wildlife Improvement Act (16 U.S.C. 7421; 92 Stat. 3110)
- Lacy Act Amendments of 1981 (P.L. 97-79; 95 Stat. 1073, 16 U.S.C. 3371-3378)
- Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 [Title I of P.L. 101-646 (104 Stat. 4761)]
- Oil Pollution Act of 1990 [Public Law 101-380 33 U.S.C. 2701 et seq; 104 Stat. 484]
- Comprehensive Environmental Response Compensation and Liability Act (Superfund) (26 U.S.C. 4611-4682; P.L. 96-510, December 11, 1980; 94 Stat. 2797)
- National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852) as amended by P.L. 94-52
- National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended
- Emergency Relief Appropriations Act (49 Stat. 115)

- Reclamation Laws (54 Stat. 1198, 1199)
- Flood Control Act of 1962 (76 Stat. 1193)
- White Act (46 Stat. 371)
- Flood Control Act of 1944, as amended 1950 (58 Stat. 887)

Area-Specific Authorizations

- U. S. v. Washington, "Boldt Decision" [384 F. Supp. 312 (1974); affirmed, 520 F. 2d 676 (1975); cert. denied, 423 U.S. 1086 (1976)]. *(the Puget Sound Salmon Management Plan and the Hood Canal Salmon Management Plan result from this decision)*
- Pacific Salmon Treaty Act of 1985, "U.S./Canada Pacific Salmon Treaty" (P.L. 99-5, 16 U.S.C. 3631, 03/15/1985)
- Salmon and Steelhead Conservation and Enhancement Act (16 U.S.C. 3301-3325)
- Pacific Northwest Electric Power Planning and Conservation (16 U.S.C. 839, P.L. 96-501, 94 Stat. 2697) as amended

ATTACHMENT 3: Pathogens Noted at Quilcene NFH

Parasites:

Epistylis - Seen commonly on coho but usually not a problem. Occasionally formalin treatments are used according to EPA and FDA guidelines.

Ichthyobodo sp. - Seen occasionally on the gills. Treatment for this pathogen has not been indicated in the past 10 years.

Chilodonella - Seen during heavy loadings during an INAD study protocol, has not been seen since.

Fungi:

Saprolegnia spp. - seen occasionally on eggs, juveniles post-handling and returning adults. Controlled by FDA- and EPA-approved use of formalin. If control measures are used, no problems are encountered. Occasionally, hydrogen peroxide is used for control and is considered a "compound of low regulatory priority" by FDA.

Bacteria:

Flavobacterium psychrophilum - Coho have shown disease in fry through smolt stage depending on environmental conditions that promote the pathogen (loadings, handling, abrasion, etc.) Depending on severity, oxytetracycline has been used under an INAD permit.

Renibacterium salmoninarum - Present in all coho populations within the hatchery and documented in wild salmonid fish in the river system. There have not been any epizootics in the hatchery since spring Chinook were reared, when there were significant disease problems in that stock.

Aeromonas salmonicida - Has been cultured from returning adults as part of broodstock fish health monitoring. In 1998, an oxytetracycline-resistant *A. salmonicida* was isolated from one broodstock sample. Has not been a significant pathogen in juveniles.

Flavobacterium branchiophilum - "Gill disease" was seen occasionally in summer chum; less in fall chum. Treatments (Chloramine-T) have been used in the past under INAD permit, but the pathogen was better controlled through using recommended density, flow, water exchange rates, and cleaning the tanks in the afternoon to provide a clean bottom for them to rest on overnight. Not seen in coho.

Viruses:

Infectious Hematopoetic Necrosis Virus (IHNV) - Isolated in 1990 and 1999 in returning chum salmon adults. Has never been isolated in juveniles and has not caused disease to date.

Release Strategies:

Release is by size, seasonality, and environmental conditions determined most optimum by the members of the Hatchery Evaluation Team (HET). Any deviation due to disease is discussed and documented by the NFH, OFHC, and WWFWO. Conditions of release due to disease would depend on drug withdrawal requirements, severity of disease, and potential impacts on survival and to wild populations. Unscheduled releases are very rare, but may occur if water flows are disrupted or fish exceed recommended loading parameters.

ATTACHMENT 4: Fish Health Guidelines for Marking and Tagging

INTRODUCTION

The necessity for marking fish for population management purposes is recognized as essential to collect data for scientifically based decisions on resource issues. The procedures and handling required to mark or tag fish for management purposes do produce stress on fish. Stress can be cumulative and is a factor in decreasing the fish's ability to resist infection or adapt to other environmental change. These stresses can be managed in such a way as to minimize the physiological impact and ultimate survival of the fish on a population basis. Reduction of, and recovery from adverse physiological consequences of stress can be achieved through environmental and procedural manipulation.

ENVIRONMENTAL CONSIDERATIONS

1. Most hatcheries are subject to seasonal fluctuation in water volume and quality. The two most important considerations are temperature and flow available to the fish at any point in time. Additional water quality issues may be turbidity, oxygen, pH, and other water chemistry factors.

2. Density (crowding) of fish within the rearing ponds both prior to marking and during any recommended holding time after marking.

FISH CONDITION CONSIDERATIONS

1. Size

2. Health status

3. Recovery time allowed

RECOMMENDATIONS

1. Tagging trailer and equipment must be cleaned and disinfected prior to use at the hatchery.

2. Equipment (nets, crowders, etc) used during marking operations must be disinfected between ponds involved in marking operations.

3. Populations or ponds designated for marking operations should not be fed for at least 24 hours before handling.

4. Marking operations should not commence, nor continue if water temperatures exceed 56° F (13° C).

5. Marking operations should not commence for 4 days following any other unusual operational stress such as chemical treatments, inventory, pond splits, vaccinations, sudden water loss, etc.

6. Olympia Fish Health Center must be notified and consulted at least one week prior to marking operations. This consultation is necessary to inform marking coordinators of any unforeseen, unusual, or specific fish health considerations that may arise.

7. Marking and tagging must be scheduled to allow at least 7 days recovery time of the fish before release or removal from the hatchery. This recovery time also can be used for diagnostic follow-up, documentation of marking effects, or treatments that may be recommended by Fish Health Center staff.

8. At no time will Density Indexes (D.I.) levels exceed 0.20 either before or after marking operations.

9. At no time will Flow Indexes (F.I.) exceed 1.0 either before or after marking operations.

10. If unusual mortality occurs during marking operations, the tagging operator should cease operations and immediately notify the Western Washington Fish and Wildlife Office (WWFWO), the Olympia Fish Health Center (OFHC), and the NFH. Consultation with all three offices will determine appropriate treatments and whether operations can resume. Any unusual mortality following tagging must be reported to OFHC and WWFWO for appropriate investigation.

ATTACHMENT 5: Hazard and Critical Control Point Plan for Quilcene NFH

Activity Description	
Facility: Quilcene National Fish Hatchery	Site: Quilcene, WA (Big Quilcene River)
Project Coordinator: Larry Telles Sonia Mumford	Activity: Aquaculture (Coho Salmon)
Site Manager: Ron Wong	
Address: 281 Fish Hatchery Rd. Quilcene, WA 98376	
Phone: 360-765-3334	

Project Description
Quilcene NFH was authorized by 35 Stat. 589 on June 29, 1909 and is currently operated by the U.S. Fish & Wildlife Service, an agency of the Department of Interior. This statute authorized the Secretary of Commerce and Labor to establish "two or more fish cultural stations on Puget Sound, or its tributaries in the State of Washington, for the propagation of salmon and other food fishes”. Quilcene NFH is located in northwestern Washington at the confluence of the Big Quilcene River and Penny Creek on the east side of the Olympic Peninsula in Jefferson County. The hatchery facilities lie in a narrow valley approximately 2.6 miles upstream of Dabob Bay, an arm of Hood Canal. The mission of Quilcene NFH is to produce migrant salmon smolts for the restoration and enhancement of salmonid stocks in Puget Sound for the benefit of all citizens including the support of traditional tribal commercial and subsistence fisheries. These migrating fish ultimately will provide returns of sufficient numbers of adults to benefit commercial, recreational, tribal commercial and tribal subsistence fisheries, as well to provide fish for hatchery production and to aid in the recovery of imperiled stocks of salmonids in Puget Sound. The hatchery currently raises only coho salmon (*Oncorhynchus kisutch*).

Hazards: Species Which May Potentially Be Moved/Introduced
Vertebrates: List Species/Types: None. Comments: No survey done.
Invertebrates: List Species/Types: None. Comments: No survey done.
Plants: List Species/Types: None. Comments: No survey done.
Other Biologics: (Fish Pathogens) List Species/Types: Coldwater Disease (*Flavobacterium psychrophilum*) Bacterial Kidney Disease (*Renibacterium salmoninarum*) Various parasites Viruses
Others: List Species/Types: None Comments:

Flow Diagram

Task 1	Adult collection for spawning, carcass distribution to Tribes and Bureau of Prisons contractor for human and pet consumption, and passing adult fish upstream
Task 2	Spawning.
Task 3	Egg incubation, shocking, and counting.
Task 4	Eyed eggs transferred to George Adams Fish Hatchery (Washington Department of Fish & Wildlife).
Task 5	Fish reared in raceways.
Task 6	Fish marked and tagged.
Task 7	Fish transferred to Skokomish net pen in Quilcene Bay.
Task 8	Fish released into Big Quilcene River from hatchery.

Hazard Analysis Worksheet

1 Tasks (from HACCP Step 3 B Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point (yes/no)
Adult collection, carcass distribution to Tribes and Bureau of Prisons contractor, and passing adult fish upstream	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potential pathogen carriers	Discontinue upstream passage	No
Spawning	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Sampling broodstock for disease which may result in culling of broodstock or eggs, disinfection of eggs in iodophore	No

1 Tasks (from HACCP Step 3 B Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point (yes/no)
Egg incubation, shocking, and counting	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Disinfect equipment	No
Eyed eggs transferred to George Adams Fish Hatchery (Washington Department of Fish & Wildlife)	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Sampling broodstock for disease which may result in culling of broodstock or eggs, disinfection of eggs in iodophore	Yes

1 Tasks (from HACCP Step 3 B Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point (yes/no)
Fish reared in raceways	Vertebrates None	No		n/a	No
	Invertebrates	No		n/a	No
	Plants	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Fish health monitoring by Fish Health Center pathologist, adhering to density and flow indices recommended by Fish Health Pathologist	No
Fish marked and tagged	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Disinfection of trailer and equipment between species and before moving trailer	Yes

1 Tasks (from HACCP Step 3 B Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point (yes/no)
Fish transferred to Skokomish net pen in Quilcene Bay	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Pre-transfer sampling of fish population Disinfection of state and tribal equipment	Yes
Fish released into Big Quilcene River from hatchery	Vertebrates None	No		n/a	No
	Invertebrates None	No		n/a	No
	Plants None	No		n/a	No
	Others Fish Pathogens	Yes	Potentially pathogenic	Pre-release disease sampling of fish population	Yes

HACCP Plan Form								
			Monitoring					
Critical Control Point (CCP)	**Significant Hazard(s)**	**Limits for each Control Measure**	**What**	**How**	**Frequency**	**Who**	**Evaluation & Corrective Action(s) (if needed)**	**Supporting Documentation (if any)**
Eyed eggs transferred to George Adams Fish Hatchery	Pathogen or Disease Transfer	>100 ppm iodophore for > 1/2 hour; culling based on results of disease sampling of broodstock; < 76 ppm iodophore < 11 minutes @ receiving hatchery visual check for plant, animal contamination	100% of eggs	RESPONSIBILITY OF RECEIVING HATCHERY				
Fish Tagged and Marked	Pathogen or Disease Transfer	> 200 ppm Chlorine; > 70 % alcohol; > 100ppm iodophore solution. Contact time: > 10 minutes	Disinfection of trailer and equipment	Apply to all surfaces and pipes via spray or wipe	Between species and before leaving hatchery	Tag Super	Repeat disinfection process properly	Log Book

Critical Control Point (CCP)	Significant Hazard(s)	Limits for each Control Measure	What	How	Frequency	Who	Evaluation & Corrective Action(s) (if needed)	Supporting Documentation (if any)
Fish transfer to Skokomish net pen in Quilcene Bay	Pathogen or Disease Transfer	Pre-transfer sample by pathologist	60 fish sample from lot to be transferred	Random grabs from throughout population to be released	Once before release, within 3 weeks of transfer	OFHC	Treat or do not transfer	Fish Health Inspection Report
Fish released to Big Quilcene River from hatchery	Pathogen or Disease Carriers	Pre-release sample by pathologist	60 fish sample from lot to be released	Random grabs from throughout population to be released	Once before release, within 3 weeks of release	OFHC	Treat or do not release	Fish Health Inspection Report

Facility: Quinault National Fish Hatchery	**Activity:** Aquaculture (Coho Salmon)
Address: 281 Fish Hatchery Rd. Quilcene, WA 98376	
Signature: **HACCP Plan was followed. Plan will be modified to reflect future ANS risks as they become apparent and are identified.**	**Date:**

ATTACHMENT 6: Past Evaluations of Hatchery Stocks Using Coded-Wire Tags

Coho Salmon

Quilcene NFH coho salmon releases have been tagged for survival and contribution monitoring and for coast-wide harvest management from brood 1977 to 1981 and continuously from brood 1987 to present. Also, some specific off-station releases were tagged as early as brood 1974. Early survival estimates were reported to range between 5.87% to 10.49% for on-station releases and 0.63% to 5.65% for off-station releases (Knudsen et al. 1989).

Summer Chum Salmon

The first brood of summer chum salmon produced in 1992 was coded-wire tagged for survival estimation and for hatchery stock identification. There were few recoveries from this initial group of tagged fish. However, the recoveries occurred in a few previously unsuspected Puget Sound sport fisheries as well as several Canadian commercial fisheries. Specifically, the sport recoveries occurred in Washington Area 2 (Westport), Area 5 (Sekiu), Area 7 (San Juan Islands), Area 10 (Seattle), and Area 10A (Elliot Bay). The Canadian recoveries occurred in the Northwest and Central Vancouver Island troll fisheries and the Johnstone Strait and Strait of Juan de Fuca net fisheries.

Fall Chinook Salmon

Although a fall Chinook salmon program was initiated with brood 1949, no evaluation occurred using marking techniques until brood 1972. The program had floundered for years using different stocks and rearing and release strategies that attempted to establish a consistent return. Based on poor returns and survival estimates as indicated by coded-wire-tag recoveries, the fall Chinook salmon program was terminated after the 1979 release (Knudsen et al. 1989).

Spring Chinook Salmon

A spring Chinook salmon recovery program was initiated at Quilcene in 1978. The program was designed to establish an appropriate stock for restoration purposes in Puget Sound using various stock crosses, beginning with Nooksack River x Cowlitz River crosses. Coded-wire tagging was initiated with the first release and continued through the 1993 release. The program was terminated in 1994 based on poor survival and return estimates as indicated by the coded-wire-tagging program (Hiss et al. 1988; Kane 1992).

ATTACHMENT 7: Recommendations of HSRG Specific to Quilcene NFH

HATCHERY SCIENTIFIC REVIEW GROUP
Puget Sound and Coastal Washington Hatchery Reform Project

Big Quilcene Hatchery Coho

US Fish and Wildlife Service

Stock Goals:	Current	Short-Term	Long-Term
Biological Significance	Intermediate	Intermediate	Intermediate
Population Viability[12]	High	High	High
Habitat	Limiting	Limiting	Limiting
Harvest Opportunity	Each Year	Each Year	Each Year
Hatchery Program:			
Purpose	Harvest		
Type	Segregated		

[12] *In the case of a segregated harvest program, population viability ratings are low, medium and high and refer to the stock's ability to sustain itself in the culture environment.*

PROGRAM DESCRIPTION

This stock has been artificially propagated since 1911 and currently exhibits a run timing that is slightly earlier than other stocks of Hood Canal coho. Eggs have been provided from Hoodsport Hatchery, the Skokomish, Duckabush, Skagit (Skagit region), Skykomish (Stillaguamish/Snohomish region), Dungeness (Eastern Straits region), Quinault (North Coast region) and Clackamas (Oregon) rivers, and Lake Washington (Lake Washington sub-region of Central Puget Sound). The last eggs were imported in 1973. 450,000 yearlings are released on-station at Quilcene National Fish Hatchery (NFH). Adult collection, incubation and rearing occur on-station.

OPERATIONAL CONSIDERATIONS

The last import of eggs for this program was in 1973.

- The hatchery stock has an extensive tagging history, with the stock currently serving as a double index indicator stock under the Pacific Salmon Treaty.
- The remainder of the hatchery release is marked with an adipose fin clip.
- Total survival rates for the program have been very consistent, averaging approximately 4.8% for brood years 1987–98.
- The stock displays earlier run timing than other coho stocks in Hood Canal. This is thought to be a result of past artificial selection at the hatchery.
- Strays from the program contribute to the high occurrence (40-50%) of hatchery fish in natural spawning populations in northern Hood Canal streams.

BENEFITS AND RISKS

A. Consistent with short-term and long-term goals?

The program provides annual harvest opportunity consistent with the short- and long-term goals for the stock.

B. Likelihood of attaining goals?

The contribution of the program to harvest has changed dramatically since brood year 1994, with returns from the program currently underused. Prior to that time, the program contributed approximately 26,000 fish annually to all fisheries. Brood years 1995-98, however, have only contributed approximately 4,400 fish per year to all fisheries. Hatchery escapement during the same period has averaged approximately 15,000 fish per year, well in excess of the broodstock needs. Terminal area catches in Quilcene Bay and the Big Quilcene River (attributed to this program and the Quilcene Bay Net Pens) have averaged only 2,000 and 300 fish, respectively, from 1996–2001.

C. Consistent with goals for other stocks?

The program presents a risk to summer chum through predation at the juvenile stage and through bycatch in fisheries directed at returning coho adults. The predation risk is mitigated to some extent by release timing consistent with the Summer Chum Salmon Conservation Initiative (SCSCI). The program poses genetic risks from straying to naturally produced coho in Hood Canal. It also poses potential competition risks with other natural coho stocks in Hood Canal. The program presents a predation risk to fall chum, pink and Chinook stocks.

RECOMMENDATIONS

Replace the current hatchery brood stock with a normal-timed, in-region brood stock to improve harvest opportunity and reduce incidental harvest on summer chum.

- Adjust the program's size to control straying and to be consistent with harvest goals and goals for other stocks, including summer chum conservation. Since the program consistently produces unharvested returns that exceed escapement needs, it should either be reduced or additional harvest options should be explored that take full advantage of harvest opportunities.
- Select Big Beef Creek coho as the broodstock source, if the program is to provide fish for the Port Gamble Net Pen, as recommended by the HSRG for that program. Maintain its integration with Big Beef coho by introducing an annual average of 10–20% natural spawning fish of Big Beef Creek origin.
- Increase the use of jacks to ten percent of the males used for spawning.
- Mark and continue to tag hatchery releases to evaluate their contribution to natural spawning populations and to harvest.
- Devise and implement a strategy to transition from the current stock to the new one.

COMMENTS

Modification of the program's size should prevent underutilization of returns from the program.

- The program should also be sized and designed to provide freshwater rearing support for the Port Gamble Bay Net Pens. Development of an integrated broodstock program will reduce the straying risks from this program and the Port Gamble Bay Net Pens.

- The managers identified a single coho stock for naturally-spawning populations in Hood Canal. Part of the rationale for recommending replacement of the existing coho hatchery stock at Quilcene NFH is its long history of artificial propagation (since the early 1900s) as a segregated stock, and the potential domestication and genetic risks this stock poses to naturally-spawning stocks in Hood Canal due to straying. Net pen releases from Quilcene Bay and Port Gamble Bay significantly increase this straying risk, thus warranting a different hatchery stock if those net pen releases are to continue.

MANAGERS RESPONSE

The HSRG recommends replacing the coho brood stock and selecting Big Beef as the source, if the Quilcene NFH continues to support the Port Gamble Net Pen program. However, the co-managers believe it would be prudent to develop more information upon which to base such a decision. The tribes believe a genetic assessment and straying study of north Hood Canal coho populations should be done, to provide better evaluation of the risks, help the co-managers decide on program objectives, and help decide what hatchery programs should continue and what stock the continuing programs should use.

Surplus coho returns to the hatchery are occurring at the current program size. While in recent years, harvest opportunity has been compromised by harvest limitations to protect summer chum, new fishing opportunities have been developed (an in-river recreational fishery and tribal dip net fishery). The tribes plan to explore additional fishing opportunities and, if the co-managers decide to change to a brood stock of later timing, the constraints associated with protecting summer chum may be removed, thus increasing harvest opportunity. Furthermore, the tribes and others are fully utilizing the current coho surpluses at the hatchery; there is no waste of these fish.

See also Appendix B: US Fish and Wildlife Service Response to HSRG Recommendations.

Quilcene Bay Net Pen Coho

Skokomish Tribe and US Fish and Wildlife Service

Stock Goals:	Current	Short-Term	Long-Term
Biological Significance	Low	Intermediate	Intermediate
Population Viability[15]	High	High	High
Habitat	Limiting	Limiting	Limiting
Harvest Opportunity	Each Year	Each Year	Each Year
Hatchery Program:			
Purpose	Harvest		
Type	Segregated		

[15] *In the case of a segregated harvest program, population viability ratings are low, medium and high and refer to the stock's ability to sustain itself in the culture environment.*

PROGRAM DESCRIPTION

Quilcene Bay net pen coho are of Quilcene National Fish Hatchery (NFH) stock. 190,000 yearlings are released on-site at the net pens. Adult collection, incubation and rearing prior to saltwater transfer occur at Quilcene.

OPERATIONAL CONSIDERATIONS

Smolts are transported to the net pens in January for release in May at 15 fish per pound.

- Since broodyear 1996, a portion of the fish from this program has received a double index tag prior to saltwater transfer. Previous tagging was limited and inconsistent. The remainder of the hatchery release is unmarked.
- Total survival rates for the program have averaged approximately 3.8%.
- The program has been reduced from a planned release of 400,000 fish to its current size.
- The stock displays earlier run timing than other coho stocks in Hood Canal. This is thought to be a result of past artificial selection at Quilcene NFH.
- Smolts are immersed in a *Vibrio anguillarum* vaccine during transport to the net pens.
- The program has had occasional mortality problems from noxious phytoplankton (1987, 1989, and 2003).
- Strays from the program contribute to the high occurrence (40–50%) of hatchery fish in natural spawning populations in northern Hood Canal streams.

BENEFITS AND RISKS

A. Consistent with short-term and long-term goals?

The program is providing some harvest benefits, but appears to contribute minimal benefits to the terminal area fishery in Quilcene Bay relative to the contribution of the Big Quilcene Hatchery coho program. For return years 1991–96, this contribution generally ranged from 30–900 fish.

B. Likelihood of attaining goals?

Terminal area catches in Quilcene Bay and the Big Quilcene River (attributed to both this program and the Big Quilcene Hatchery coho) have averaged only 2,000 and 300 fish, respectively, from 1996–2001. This is likely due to the current depressed market for salmon and to harvest limitations caused by conservation concerns for summer chum.

C. Consistent with goals for other stocks?

The program poses genetic risks from straying and potential competition risks to naturally produced coho in Hood Canal. The genetic risk is compounded in this case by the inability to remove uncaught hatchery fish at a broodstock collection site. It also poses potential predation risks to summer and fall chum, pink and Chinook. The risk to summer chum is mitigated by release timing consistent with the *Summer Chum Salmon Conservation Initiative* (SCSCI). The program also poses a risk to Quilcene River summer chum from fishery-induced mortality, because of the significant overlap in timing with that stock.

RECOMMENDATIONS

Discontinue the program, because of limited harvest benefits and high genetic risks.

COMMENTS

Discontinuing this program would also provide Quilcene NFH with the capacity to meet rearing needs for the Big Quilcene hatchery coho and the Port Gamble Net Pen programs.

MANAGERS RESPONSE

The Skokomish Tribe supports the joint comments made by the state and the Point-No-Point Treaty Council Tribes regarding the Quilcene Hatchery coho, since the net pen program is basically an extension of it. The Tribe is interested in exploring the use of a later-timed coho stock of local origin, because it

may provide greater harvest opportunity for coho and reduced harvest-related mortality on summer chum. This could address the concerns identified in the Benefits and Risks section. No major changes should be made to the current program until after the assessments and studies referred to in the WDFW/Tribal joint comments (Quilcene Hatchery section) are completed.

The Skokomish Tribe also reports that the tribal, state and federal hatchery staff members involved have agreed to move the transfer date to early March, to minimize mortality related to noxious phytoplankton.

Little Quilcene/Big Quilcene Summer Chum

US Fish and Wildlife Service

Stock Goals:	Current	Short-Term	Long-Term
Biological Significance	Intermediate	Intermediate	Intermediate
Population Viability	At Risk	At Risk	At Risk
Habitat	Inadequate	Inadequate	Limiting
Harvest Opportunity	None	None	Occasional
Hatchery Program:			
Purpose	Conservation		
Type	Integrated		

PROGRAM DESCRIPTION

This program began in 1992, with the collection of 411 adults for broodstock. This stock is native to the Big Quilcene/Little Quilcene area and is part of the Hood Canal summer chum GDU. 300,000 fed fry are released on-station from the Quilcene National Fish Hatchery (NFH). Adults are collected from beach seines during the coho-targeted fishery in Quilcene Bay. Spawning, incubation, rearing, and release occur at Quilcene NFH. This stock is one of 14 stocks within the Hood Canal summer chum GDU.

OPERATIONAL CONSIDERATIONS

Spawning is pairwise (one-to-one) mating.

- All released fish are adipose fin clipped. One-hundred percent marking has occurred since 1998.
- 2003 is the last scheduled year of adult collections and spawning for this 12-year program under the *Summer Chum Salmon Conservation Initiative* (SCSCI).
- Summer chum spawn throughout the lower Big Quilcene River, with an increasing proportion of hatchery-origin adults as one moves upstream from the bay to the hatchery. In 2002, approximately 50% of the returning adults in the Big Quilcene River were of hatchery origin (age three = 39%; age four = 68%; age five = 22%).

BENEFITS AND RISKS

A. Consistent with short-term and long-term goals?

The program is consistent with the managers' goals for the stock.

B. Likelihood of attaining goals?

The program has attained the conservation goals for the stock. Total adult returns ranged from one to 731 adults from 1979–94 and from 2,788–9,250 adults from 1995–2002, respectively. The long-term viability of the stock will be likely if the post-release environment is able to support the population, and if current harvest management is continued.

C. Consistent with goals for other stocks?

There is a potential straying risk by fish from this program to summer chum populations in the Duckabush and Dosewallips rivers. In 2001, 11% and 18% of natural spawners in those two rivers, respectively, were adipose fin clipped fish from Quilcene NFH. In 2002, those percentages were 19% and 27%, respectively. Those two populations are intended to serve as "control" populations, with no hatchery influence under the SCSCI. Three percent of natural spawners in the Hamma Hamma River in 2002 were also adipose fin clipped fish from Quilcene NFH. In 2003, approximately two percent, three percent and one percent of the summer chum sampled in the Dosewallips, Duckabush, and Hamma Hamma, respectively, were adipose fin clipped fish from Quilcene NFH.

RECOMMENDATIONS

Discontinue the program in 2003, one year short of the maximum 12 years specified in the plan.

COMMENTS

The program has achieved its conservation goal for the stock. Recovery programs need not continue once the goals have been achieved. The primary concern now is the straying risk to other populations.

- The SCSCI is a well-designed, well-conducted program that appears to be achieving its goals. It is an example of a successful conservation program and partnership among state, tribal, private, and federal entities.
- The program, which may serve as a prototype for similar efforts in the future, has met the HSRG's first key principle of beginning with a solid goal setting process. Ensuring complete monitoring and evaluation of this program will be crucial to meeting the second and third principles—scientific defensibility and informed decision-making.
- Like all integrated hatchery programs, success will depend on good habitat being available to both the hatchery- and natural-origin components of the integrated population (see HSRG system-wide recommendation about productive habitat).

MANAGERS RESPONSE

The co-managers appreciate the HSRG comments in support of the SCSCI and support the recommendations of the HSRG.

- The co-managers agree that collecting and analyzing data is necessary to evaluate the program; however, additional funding will be needed to fully implement the monitoring and evaluation work described in the SCSCI. For example, critical objectives of the SCSCI include the monitoring and evaluation of the effects of reintroduction and supplementation on the natural summer chum populations and of the effectiveness of the programs in recovering summer chum. Monitoring and evaluation of the supplementation and reintroduction programs is ongoing by the co-managers and cooperators. However, dedicated funding is not currently available for the analysis of all otolith and DNA samples collected from summer chum adults returning to streams in the Hood Canal ESU. Some funding has been provided by the Regional Fish Enhancement Groups (HCSEG and NOSC), the Port Gamble and Skokomish tribes (BIA Salmon Recovery

funds), and by WDFW (ESA Salmon Recovery funds). However, these sources of funds are not totally secure and additional funding is needed.

See also Appendix B: US Fish and Wildlife Service Response to HSRG Recommendations.

Big Quilcene Fall Chum

US Fish and Wildlife Service

Stock Goals:	Current	Short-Term	Long-Term
Biological Significance	Intermediate	Intermediate	Intermediate
Population Viability	At Risk	At Risk	At Risk
Habitat	Inadequate	Inadequate	Limiting
Harvest Opportunity	Each Year	Each Year	Each Year
Hatchery Program:			
Purpose	Harvest		
Type	Integrated		

PROGRAM DESCRIPTION

The Big Quilcene chum stock originated from spawners trapped on the Big and Little Quilcene rivers, but it has also had major inputs from stocks in the Duckabush and Dosewallips rivers and particularly from Walcott Slough. This stock is largely the result of a transfer of the Walcott Slough stock, back into the Quilcene system. The Walcott Slough stock has been maintained as a large hatchery stock since the early 1900s, and was originally developed from local returns and hatchery transfers from the Quilcene and Duckabush hatcheries. This stock of fall chum has a return timing that is later than other fall chum in Hood Canal; typically fish enter the Big Quilcene River from mid-November through the end of December. This stock is one of six stocks within the Hood Canal fall chum GDU. The current program involves a release of 2.2 million fry at 454 fish per pound into the Big Quilcene River. Adult collection and egg-take occur on-station at the Quilcene National Fish Hatchery (NFH), as does incubation, hatching, rearing and release.

OPERATIONAL CONSIDERATIONS

Egg-take at Quilcene occurs from mid-November to the end of December (the stock is a late run stock), but hatchery returns sometimes fall short of the program's needs.

- Releases take place in May, to avoid interactions with listed summer chum.
- All releases are unmarked.
- IHN virus has been detected in spawners at Quilcene.
- The program has on occasion provided eggs for the Enetai Hatchery fall chum program.

BENEFITS AND RISKS

A. Consistent with short-term and long-term goals?

The short- and long-term goal for this stock is harvest, and the program is being operated in a manner consistent with this goal. However, see B., below.

B. Likelihood of attaining goals?

The program provides for harvest opportunity, but the harvest benefits from the program are very limited because the chum fishery in Puget Sound is managed to target the early-run fall chum.

C. Consistent with goals for other stocks?

Considering the size of the fish at release, the program is not likely to pose any significant ecological risk to other species of salmonids in Hood Canal. Also, the timing of release should ensure that risks to listed Hood Canal summer chum are minimal. The relatively small size of the program reduces the risk of any significant competition with wild fall chum juveniles in Hood Canal. It also reduces the likelihood of any significant adult straying. However, coho are also released from the hatchery in May, posing a potential predation risk to the chum.

RECOMMENDATIONS

Discontinue the current fall chum program, since it confers no significant harvest benefits.

- Allow the Big Quilcene River fall chum stock to maintain itself naturally in the Big Quilcene River.

COMMENTS

None.

MANAGERS RESPONSE

The co-managers agree with the recommendations. The fall chum program was discontinued with the 2003 brood year.

See also Appendix B: US Fish and Wildlife Service Response to HSRG Recommendations.

Facility and Regional Recommendations

Assembled below are the Hatchery Scientific Review Group's recommendations that involve capital improvements at hatchery facilities in the Hood Canal region. Also included is a region-wide recommendation.

ALL HOOD CANAL FACILITIES

In order to maximize benefits from hatchery production, take into account facility water and space availability in determining the optimum species mix.

- Provide the needed equipment for fish culture and biological sampling (fish pumps, crowders, sorting facilities, abatement ponds, etc.).
- In order for hatcheries to adequately follow the general principles of scientific defensibility and informed decision making, the HSRG supports the need for increased monitoring and evaluation capabilities. This would include the acquisition of the equipment necessary for these activities. Examples would include the following:
    - Equipment for adult handling to improve both the recovery of evaluation data and to facilitate safe passage upstream of natural-origin fish.
    - Equipment to facilitate adult collection for inclusion in integrated hatchery brood stock population management.

- Equipment for monitoring and evaluating the population status of integrated hatchery stocks and associated natural spawning populations.
- Equipment for improving hatchery inventory, monitoring and predator control.
- Opportunities to process data collections such as otolith reading, genetic sampling and mark recovery activities.

HSRG Appendix B. excerpt

United States Department of the Interior
FISH AND WILDLIFE SERVICE
911 NE 11th Avenue Portland, Oregon 97232-4181

February 19, 2004
Lars Mobrand Chair, Hatchery Scientific Review Group
Michael Kern, c/o Long Live the Kings
1305 Fourth Avenue
Seattle, Washington 98101

Dear Dr. Mobrand:

We have received and reviewed the Hatchery Scientific Review Group's (HSRG) Hatchery Reform Recommendations, Hood Canal, Willapa Bay, North Coast, and Grays Harbor, dated November 2003. The Fish and Wildlife Service operates three national fish hatcheries (NFH) within the Hood Canal and North Coast areas and welcomes this opportunity to respond to the recommendations contained in the report.

We commend the HSRG for the large volume of data that was summarized and interpreted that led to the development of the recommendations. The scope and depth of the review were impressive.

Our comments to the recommendations are presented below, first from a general or overall focus and then from a recommendation-specific focus.

Generally, we find the presentation of regional steelhead management confusing since the regional recommendation is reiterated for each individual steelhead program. We would suggest that the regional steelhead recommendation be stated once, and that specific programs be cross-referenced to the regional recommendation where appropriate.

We agree with the area-wide recommendations of sizing programs appropriately for the physical capabilities of the facility and minimizing negative ecological interactions with wild fish. However, we feel that sizing programs to match conditions of changing ocean productivity is unrealistic. It presupposes that we are able to predict ocean productivity three to five years into the future.

We support the recommendations to increase the spawning of coho jacks to 10 percent of the male spawning population.

Recommendations to incorporate volitional releases will require significant funding to reconstruct existing rearing pond outlets.

Big Quilcene Hatchery Coho (Quilcene NFH)

The use of the term "stray rates" concerns us. In the briefing book, reference was made to the incidence of Quilcene Bay netpen fish in the Quilcene hatchery rack return as indicative of local stray rates to other streams. Since Quilcene Bay netpen coho are raised to the pre-smolt phase at Quilcene NFH and transferred to the netpens in February of their second year, they have an imprinting history that includes Quilcene NFH. The tendency of these fish to return to the NFH is indicative of homing, not straying. We suggest that funds be made available to more accurately document and define the incidence of stray hatchery and netpen-origin coho in northern Hood Canal streams.

We believe the suggestion that Big Beef Creek stock be used to replace the Quilcene stock is premature. Coded-wire-tag recovery records indicate that a significant number of stray coho from the Agate Pass netpens have been present in the Big Beef Creek escapement. The stocks of fish used in this program have been Minter Creek (South Puget Sound) and Wallace River (Skykomish), neither of which are representative of Hood Canal stocks. Before 1994, Dungeness (Strait of Juan de Fuca) stock was used in northern Hood Canal netpen programs, and that stock comprised a large proportion of the strays into Big Beef Creek. In order to accept Big Beef Creek stock as a replacement, there should be some evidence that the stock is not composed of out-of-basin stocks, or has a smaller composition of non-local stocks than other potential replacement stocks. Choice and development of a replacement stock will have impacts to the current netpen programs in Quilcene Bay and Port Gamble Bay.

We suggest that funds be made available to examine the genetic profiles of all northern Hood Canal coho stocks. If a more suitable native stock or a stock that is less influenced by non-local stocks is present, that stock would be a more logical choice for use as a replacement. In the interim, while stock profiles are generated, we will develop a plan to restore the Quilcene coho stock to a later, more natural, return timing. A later return timing would reduce the degree of overlap in summer chum and coho returns in September.

We have developed a plan to reduce Quilcene NFH on-station coho production by approximately 10 percent to address rearing environment concerns. Acceptance by the co-managers is required before the plan can be implemented. The HSRG recommendation for Quilcene NFH to raise coho for the Port Gamble netpens would require a significant reduction in the netpen program, as

Quilcene NFH does not have the capacity to raise 450,000 pre-smolts. Our current netpen pre-smolt rearing capacity is limited to 200,000 fish

Big Quilcene fall chum (Quilcene NFH)

We agree with the recommendation, and with the consent of the co-managers, we have ended this production program. The last brood with hatchery production is 2002.

Little Quilcene/Big Quilcene summer chum (Quilcene NFH)

We agree that the program should be ended and have completed final supplementation activities for the 2003 brood at reduced production levels, consistent with the National Oceanic Atmospheric Administration Fisheries Biological Opinion and consistent with the co-manager-developed Summer Chum Salmon Conservation Initiative.

Quinault River fall Chinook (Quinault NFH)

No changes recommended.

Quinault River hatchery chum (Quinault NFH)

Monitoring of this stock, as recommended by the HSRG, will require marking of chum fry. This may be accomplished by thermally marking otoliths in the isolated incubation system, which is currently under construction. Marking, mark recovery, and analysis will require significant additional funding.

Quinault River hatchery coho (Quinault NFH)

We will work with the co-managers to keep hatchery production consistent with the goals developed for coho within the Quinault River system.

The hatchery coho are mass-marked, and contain representative double-index tag groups.

Quinault River hatchery winter steelhead – Hoh transfer/release (Quinault NFH)

We have been working with, and will continue to work with, the co-managers to develop alternatives to the current out-of-basin transfer and release.

Sooes River fall Chinook (Makah NFH)

We have developed a revised production plan that will reduce on-station releases to 2.1 million fish (33 percent reduction) to address limitations of the hatchery rearing environment. Tribal acceptance is required before it can be implemented. Due to poor eye-up, production for the 2003 brood will approach this revised production level. We now dispose of raceway mortalities by burial, to reduce disease risk.

Sooes River hatchery winter steelhead (Makah NFH)

Steelhead in the Sooes River system are not managed by fin mark. Previous fin marking confirmed the strong temporal separation between the hatchery stock and the natural stock. Run timing is used effectively to manage the harvests of the two stocks. We now dispose of raceway mortalities by burial, to reduce disease risk.

Sooes River coho (Makah NFH)

We will work with the Makah Tribe to develop a basin plan addressing the hatchery role in supporting harvest and maintaining a viable natural coho population in the upper Sooes River. We now dispose of raceway mortalities by burial, to reduce disease risk.

Thanks for the opportunity to review the HSRG Recommendations. Should you wish to discuss further our comments please feel free to contact Mr. Bob Wunderlich at the Western Washington Fish and Wildlife Office in Lacey, Washington at (360) 753-9509.

Sincerely,

Daniel H. Diggs
Assistant Regional Director Fishery Resources

ATTACHMENT 8: Low Water Options at Quilcene NFH

Background

The HETs for each hatchery have met and discussed options regarding fish releases commensurate with expected declines in water availability for fish culture. The HETs have been proactive in their discussions of these options, both internally and with some of the co-managers. However, the options presented here are reactive in the sense that the trigger that sets these options in motion is the actual reduction in flow to a point that full production programs cannot be supported.

The options presented here assume that all means of water use and mechanical re-conditioning including reuse, density and flow index manipulations, volume adjustments, Port Townsend release/withdrawal communications, and water rights exemptions, have been exhausted.

The options are presented in priority order by least potential adverse impact to the station program goals and off-station aquatic resources. The options are not mutually exclusive. That is, we may exercise combinations of the options presented. Obviously, full term production is the preferred option. However, by default the options discussed below may be the actions executed in the face of water shortages expected during late summer and fall months. Also, we do not recommend that premature coho releases be coded-wire tagged or mass marked. Drought would provide poor environmental conditions that when combined with stress related fish handling (marking/tagging) would probably result in increased fish health related problems.

Options

Full production: On-station - 400,000 coho.
Transfer to Quilcene Bay net pens - 200,000 coho.

Option A. On-station release of coho proportional to full production ratio of on-station versus pen transfer program (67% from on-station program, 33% from pen transfer program).

Rationale: Survival of an on-station release is not likely to be high because of lack of habitat. However, those that did survive would contribute to the Big Quilcene River.

Option B. Release coho juveniles to local lakes to support inland sport fisheries.

Rationale: Juvenile coho plants into lakes can provide successful sport fisheries (ex. Riffe Lake). However, the lake must be a closed system so that Quilcene coho could not emigrate and adversely affect other stocks. Also, there may be some fish health concerns regarding pathogen transfer.

Option C. Transfer juvenile coho to another Hood Canal facility for temporary rearing or extended rearing and transfer to the Quilcene Bay net pens.

Comment: No other facilities have space.

Option D. Off-station releases to other streams/watersheds.

Comment: This is not an acceptable option. Habitat would likely be compromised due to drought conditions. What little habitat that would remain will be needed for naturally spawned populations. Studies have also shown that stocked hatchery juveniles will displace natural populations. Also, fish transfers increase the risk of fish pathogen transfers.

Option E. Euthanasia.

Comment: This is not an acceptable option. The public would be outraged. Also, the investment of manpower and funding would have been wasted.

ATTACHMENT 9: 1982 Cooperative Agreement between the Service and the Bureau of Indian Affairs

AGREEMENT

Between

U. S. FISH AND WILDLIFE SERVICE

and

BUREAU OF INDIAN AFFAIRS

This Agreement is established for the purpose of distributing excess adult salmon carcasses from the Walcott Slough fish trap near Brinnon, Washington, and the Quilcene National Fish Hatchery to the Portland Area Office of the Bureau of Indian Affairs (BIA).

WHEREAS, the Fish and Wildlife Service (hereinafter called the Service) annually, because of harvest management constraints, has surplus salmon carcasses available at Walcott Slough and Quilcene Hatchery, and

WHEREAS, the Service desires to avoid wasting these fish, and

WHEREAS, the BIA has a program for distributing salmon carcasses to Tribes for subsistence,

NOW, THEREFORE, it is agreed as follows:

(1) All salmon carcasses not treated with chemicals which would make them unfit for human consumption as per FDA regulations, from Walcott Slough and Quilcene Hatchery will be transferred to BIA for use in its subsistence program. Any such transfer shall be recorded on a Transfer of Property Form DI-104 in accordance with 41 C.F.R. 114-43.102-53.

Agreement, USFWS and BIA

(2) All salmon carcasses utilized under this agreement will conform to FDA regulations.

(3) The BIA or its representative will be responsible for coordinating the distribution of carcasses such that they are removed from Walcott Slough and Quilcene Hatchery in a timely manner and will provide a record of all distribution (species, numbers, Tribes).

(4) The Service will give the BIA or its representative an estimate of how many carcasses will be available by 3:00 p.m. the day before removal.

(5) If personnel are not available to remove carcasses, the BIA or its representative will notify the Service by 3:00 p.m. the day before removal.

(6) The Service will notify the BIA or its representative before 12:00 noon the day of spawning if there is a significant change (greater than +/- 25%) in the number of carcasses available.

(7) The BIA will provide to the Service prior to receiving the carcasses the name of the authorized representative responsible for receiving the carcasses.

(8) The BIA or its representative will provide vehicle(s), ice, and personnel necessary to handle and maintain the quality of the carcasses during distribution.

-2-

Agreement, USFWS and BIA

(8) The carcasses will be picked up by 4:00 p.m. on the day of harvest unless significantly more carcasses are available than anticipated (ref. paragraph (6)).

(9) The Service may at all times reserve some carcasses for management, disease diagnostic, or research purposes.

(10) This agreement shall be in force and effect from the date of execution and shall continue in effect unless modifications are made which are agreeable to both parties or unless it is cancelled by either party after 90 (ninety) days' notice in writing.

U. S. FISH AND WILDLIFE SERVICE

by: William H. Meyer Date: 9/30/82

Name and Title William H. Meyer
Acting Regional Director

BUREAU OF INDIAN AFFAIRS

by: Date: OCT 4 1982

Name and Title STANLEY SPEAKS
AREA DIRECTOR

-3-

ATTACHMENT 10: 2006 Memorandum of Understanding between the Service and the U.S. Department of Justice

MEMORANDUM OF UNDERSTANDING 725-6

between

U. S. Department of Justice (DOJ), Federal Bureau of Prisons (BOP)

and the

U. S. Department of the Interior (DOI), U. S. Fish and Wildlife Service (USFWS)

for

Transfer of excess fish that are harvested from federal hatcheries to the Bureau of Prisons.

---

1. Scope: This MOU is entered into for the purpose of establishing a partnership between the BOP and USFWS on a mutually beneficial basis to realize cost savings to both parties. The USFWS is responsible for numerous federal hatcheries which raise and release millions of salmon into rivers in the northwestern portion of the United States. Annual harvest management constraints and spawning requirements result in the USFWS having surplus jack and adult salmon and/or steel head trout carcasses available for further distribution. In an effort to avoid wasting the fish, the USFWS has identified the BOP as a candidate eligible for portions of the annual surplus. The BOP has established a food service program for distribution of the fish to the various federal prisons across the nation.

2. Terms of Agreement: This agreement shall become effective upon signatures by both parties. Further, this agreement shall remain in effect indefinitely until modified or terminated. The agreement may be terminated by either party by providing 90 days written notice to the other party.

3. Authority: Economy Act, 31 U.S.C. §1535 and Federal Acquisition Regulations Part 17.

4. General Responsibilities: The BOP will competitively award a fish processing requirements-type contract for the retrieval, processing, storage and transport of the fish from federal hatcheries to BOP facilities.

5. Specific Responsibilities:

   USFWS will:

   a. Give first priority to existing Tribal Agreements for the transfer of excess salmon carcasses. Any existing agreements between the USFWS and Native American tribes supersede this agreement.

b. Fulfill agreements with local food banks, and educational/research programs as a second priority.

c. Reserve some carcasses for management, disease diagnostic, and/or research purposes.

d. Provide surplus salmon, on a priority basis, to the BOP from the following federal hatcheries:

California
Coleman National Fish Hatchery

Idaho
Dworshak National Fish Hatchery Complex

Oregon
Eagle Creek National Fish Hatchery

Washington
Abernathy Salmon Culture Technology Center
Leavenworth National Fish Hatchery Complex
Little White Salmon/Willard National Fish Hatchery Complex
Quinault National Fish Hatchery
Quilcene National Fish Hatchery
Makah National Fish Hatchery, ***pending Makah Tribal Council approval***
Carson National Fish Hatchery
Spring Creek National Fish Hatchery

e. **Not** transfer salmon or steel head carcasses treated with harmful chemicals making them unfit for human consumption according to Food and Drug Administration (FDA) regulations.

f. Transfer only fit for human consumption carcasses according to FDA regulations from the designated hatcheries for distribution to federal prisons.

g. Record salmon transfers on a Transfer of Property Form (General Services Administration Standard Form -120).

h. Notify the BOP contractor of carcass availability a minimum of one day before transfer.

i. Provide a record of all transfers and distribution (number, species, sex) to the BOP by April 1, of each year.

BOP will:

a. Solicit and award a contract, in compliance with existing FAR requirements, to retrieve, process, store, and transport the fish from federal hatcheries to BOP facilities.

b. Provide the USFWS a copy of the current fish processing contract (identifying the contractual terms relative to the use of excess fish from the USFWS fish hatcheries).

c. Provide written notification on an annual basis to the USFWS and federal hatcheries listed in this MOU identifying the representative (contractor) responsible for removing and processing excess fish from national fish hatcheries for distribution to federal prisons.

d. Provide a contractor to coordinate the retrieval, transfer, and distribution of fish carcasses from the listed hatcheries in accordance with existing contract terms and conditions.

e. Provide a contractor with vehicle(s), ice/refrigeration equipment, and personnel necessary to handle and maintain the existing quality of the carcasses.

f. Provide a contractor capable of retrieving the carcasses by 3:00 p.m. the day of harvest, unless significantly more carcasses are available than anticipated. If more carcasses are available than anticipated, other arrangements shall be made as agreed upon by both parties.

6. Agency Interface:

Director Excess Fish Program United States Fish and Wildlife Service, Pacific Region 1 911 NE 11th Avenue Portland, Oregon 97232 Phone: (503) 872-2763	Administrator Food and Farm Services Federal Bureau of Prisons 320 First Street, NW Room 1030 Washington, DC 20534 Phone: (202) 305-1785

7. Anti-Deficiency Act: Nothing contained herein shall be construed to obligate the Federal Bureau of Prisons to any expenditure or obligation of funds in excess or in advance of appropriations in accordance with the Anti-Deficiency Act, 31 U.S.C., Section 1341.

8. The following authorized individuals agree herewith:

DEPARTMENT OF THE INTERIOR
U. S. FISH AND WILDLIFE SERVICE

Dan Diggs
Area Regional Director, Fisheries

January 31, 2006
Date

Concur:

1-31-06
USFWS Contract Sufficiency Review
FWS#19726

DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF PRISONS

Darlene Ely
Procurement Executive
Federal Bureau of Prisons

2/14/06
Date

Concur:

Maryellen Thoms
Assistant Director
Health Services Division

ATTACHMENT 11: Fisheries Operating Needs System (FONS) Records Relating to Quilcene NFH and Vicinity

Penny Creek Study- Assessment of Proposal Allowing Fish Passage 13245-2002-001

Assessing fish barriers on FWS lands is a regional priority. Quilcene NFH has a fish barrier on Penny Creek within hatchery property. This project is a feasibility study to assess biological impacts and cost effectiveness, if the fish barrier on Penny Creek were removed. The fish barrier and associated structures on Penny Creek supply water for Quilcene NFH .The barrier is also integral to the hatchery's attraction water system, its fish ladder, and its main entrance gate. If the Penny Creek fish barrier were removed, all these structures and functions would be impacted. Allowing fish passage could also adversely impact water quality for fish egg incubation, so water sterilization technologies need to be assessed, designed, and costs estimated as part of the feasibility assessment. Project elements would include: Determination of the current impediments to fish passage; engineered designs of feasible corrections; and associated costs.

The study will enable us to make an informed decision, to allow fish passage if biologically warranted and cost effective. If passage is allowed it would require major structural real property changes at the hatchery.

Preservation of information in historic hatchery log books, annual reports, and photos 13245-2000-001

The Quilcene National Fish Hatchery (NFH) began operation in 1911. All of the original old log books (most in cursive writing), annual reports dealing with fish rearing, production and daily operation are stored at the station in a heated room. This historic information contained in the log books and photos, is routinely use by researchers, trying to answer resource management questions; such as, historic timing of fish runs, species raised, etc. As such, these historic records are priceless. The log books are made of paper that will deteriorate and crumble with age, destroying the only records of historic activities at Quilcene NFH. The information could also be lost due to fire or theft. The data and information needs to be copied/transcribed to paper, and/or microfilm and electronic form for use by fishery and land managers. Some of the photos and negatives have water damage due to a flood and will need restoration. The U.S. Fish & Wildlife Service's D.C. Booth National Historic Fish Hatchery will share cost and labor for this project. Final storage and preservation of original log books should be at the D.C. Booth National Historic Fish Hatchery located in Spearfish, South Dakota.

Hatchery Entrance Road Relocation -Safety Project 13245-2002-005

Relocate hatchery entrance road for safer access/exit to Quilcene National Fish Hatchery from U.S. Highway 101. The road off of the highway is a county road named Fish Hatchery Road. Currently, access to the hatchery involves turning off U.S. Highway 101 (two-lane road without a turn lane); the intersection is within 50 feet of a 1936 vintage bridge (with blind spots due to bridge design).

The intersection is very dangerous for exiting and entering the highway by employees, residents, and visitors. Entrance road could be relocated north of the current intersection about 300 feet. A turn lane should be placed on the highway at the relocated entrance road. A new intersection location would have a better view to safely enter or exit the highway.

This project would entail coordinating with the Washington Department of Transportation, Washington Department of Fish and Wildlife and Jefferson County. Note: Also listed in MMS # 13245.1999001

Operation of Domestic Water Filtration/Sterilization System 13245- 2004-002

Domestic well water filtration/sterilization system contains, water softener, two bag filters, chlorine injection (chlorine tablets), and monitoring. The water softener uses bags of salt tablets and also has special media for operation. The two bag filters filter the water for giardia and need regular replacement. Water is sampled quarterly for coliform bacteria and nitrates every 3 years. Funding this project will cover costs associated with operation and maintenance of the domestic water system to State of Washington standards.

Public Outreach: Enhance Visitation at Quilcene NFH 13245-1999-002

Quilcene National Fish Hatchery does not have a visitor center. However, thousands of people visit the hatchery each year (traveling on U. S. Highway 101). In 2000, the office was remodeled, which eliminated the visitor center. The current limited area for outreach displays totals 137 square feet and doubles as the office reception area. The opportunity to contact and educate the public is identified in the Quilcene NFH Station Development Plan, and includes a visitor center from which to launch the outreach effort. Public education and outreach are critical components of hatchery operations. A visitor center with associated vehicle access/parking at Quilcene NFH will satisfy needed outreach activities for the general public. This project will include displays, aquarium, fish mounts, viewing area of fish ladder, and connection to station's alarm system, a place to view fish egg collection (spawning) and be handicap accessible.

Outreach Displays and Supplies 13245-2002-004

Quilcene National Fish Hatchery is located along U.S. Highway 101, with a large potential of visitors. Funding will be used to purchase pamphlets, brochures, displays and educational items. These items will enhance the visitors' experience and also educate the public.

ATTACHMENT 12: Maintenance Management System (MMS) Listing for Quilcene NFH

- Adult fish handling/spawning (interim fix) - Improve methods (safety) used to handle adult salmon in procedures such as lifting fish out of holding area, egg collection (spawning), tag recovery, and surplus adult salmon.
- Rehabilitate adult salmon holding/spawning area and spawning building.
- Rehabilitate electric fish weir and adult fish ladder (bypass ladder).
- Repair storm water drainage problem in visitor parking area.
- Removal of asbestos wrapped pipe in hatchery building.
- Replace 1993 Chevrolet S-10 pickup.
- Seismic rehabilitation of hatchery building (Phase 2).
- Replace hatchery entrance sign.
- Rehabilitate Quarters 4 bathroom, garage door, and electrical service (main breakers).
- Replace Quarters 3 heat pump.
- Construct new visitor center (In 2000, visitor center removed during office remodel).
- Replace rotating drum screens at the Big Quilcene pre-settling pond.
- Rehabilitate cyclone fencing, gates, and guard rails.
- Rehabilitate raceway pond covers to exclude birds and animals and provide shading for the fish.
- Rehabilitate satellite facility (Walcott Slough) entrance road.
- Replace badly deteriorated metal doors (6), jams and thresholds and replace single pane windows with thermal windows in the hatchery building. Rehabilitate safety exit lights (6), replace fluorescent lights and replace open light bulb lights. Replace heating in "Boot Room" and add venting. This one room is used by employees to change into rain suits, waders, and hip boots. Need to have safe heating and venting for this room. Current heat used unsafe. Reconfigure room to include changing area for male and females, ADA, and shower area.

- Replace several small generators with larger generator with capacity to run all buildings and equipment during power outage. At the same time, should address: 1) Bringing into the facility a true "three phase" electrical service, and replace motors as needed and to bury overhead electrical lines near shop, shop river bank and pre-settling pond.

- Rehabilitate Penny Creek water intake.

ATTACHMENT 13: Surplus Fish as Government Property

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:
AFR

JUL 10 2001

Memorandum

U.S. ... WESTERN ...

To: Fishery Project Leaders

JUL 1 2001

From: Regional Director, Region 1
Portland, Oregon

Anne Badgley

Subject: Surplus Fish as Government Property

The Hatchery system in Region 1 is currently enjoying success with increasing returns of adult fish. This success is due in no small part to the dedication of Service Fisheries employees who have worked tirelessly to ensure the Hatchery system produces quality fish. However, it is important that all Service employees honor the public trust placed in them as stewards of the Nation's resources and administrators of public property.

With this memorandum I want to emphasize that live fish entering a National Fish Hatchery (Hatchery), whole fish carcasses or their parts, are Government property and cannot be converted for personal use, even temporarily on loan. Misuse of Government property may result in disciplinary action ranging from a written reprimand to removal from the Service. The attached Standards of Ethical Conduct for Employees of the Executive Branch, contained in 5 CFR 2635.704, specifically address use of Government property. Please review and be acquainted with these standards. Also, please ensure that all your employees read and understand this memorandum.

It is important that you first consider all possible uses of hatchery fish that are consistent with the Service Mission. Surplus fish must be disposed of using prescribed government contracting procedures. Furthermore, you must comply with other Service and FDA policies related to the disposition of carcasses and parts that have been treated with chemicals making them unfit for human consumption. Should you have any questions regarding this policy, please contact the Assistant Regional Director, Fishery Resources, through your supervisor.

Attachment

performance of his official duties does not give rise to an appearance of use of public office for private gain or of giving preferential treatment, an employee whose duties would affect the financial interests of a friend, relative or person with whom he is affiliated in a nongovernmental capacity shall comply with any applicable requirements of § 2635.502.

(e) *Use of terms of address and ranks.* Nothing in this section prohibits an employee who is ordinarily addressed using a general term of address, such as "The Honorable", or a rank, such as a military or ambassadorial rank, from using that term of address or rank in connection with a personal activity.

§ 2635.703 Use of nonpublic information.

(a) *Prohibition.* An employee shall not engage in a financial transaction using nonpublic information, nor allow the improper use of nonpublic information to further his own private interest or that of another, whether through advice or recommendation, or by knowing unauthorized disclosure.

(b) *Definition of nonpublic information.* For purposes of this section, *nonpublic information* is information that the employee gains by reason of Federal employment and that he knows or reasonably should know has not been made available to the general public. It includes information that he knows or reasonably should know:

(1) Is routinely exempt from disclosure under 5 U.S.C. 552 or otherwise protected from disclosure by statute, Executive order or regulation;

(2) Is designated as confidential by an agency; or

(3) Has not actually been disseminated to the general public and is not authorized to be made available to the public on request.

Example 1: A Navy employee learns in the course of her duties that a small corporation will be awarded a Navy contract for electrical test equipment. She may not take any action to purchase stock in the corporation or its suppliers and she may not advise friends or relatives to do so until after public announcement of the award. Such actions could violate Federal securities statutes as well as this section.

Example 2: A General Services Administration employee involved in evaluating proposals for a construction contract cannot disclose the terms of a competing proposal to a friend employed by a company bidding on the work. Prior to award of the contract, bid or proposal information is nonpublic information specifically protected by 41 U.S.C. 423.

Example 3: An employee is a member of a source selection team assigned to review the proposals submitted by several companies in response to an Army solicitation for spare parts. As a member of the evaluation team, the employee has access to proprietary information regarding the production methods of Alpha Corporation, one of the competitors. He may not use that information to assist Beta Company in drafting a proposal to compete for a Navy spare parts contract. The Federal Acquisition Regulation in 48 CFR parts 3, 14 and 15 restricts the release of information related to procurements and other contractor information that must be protected under 18 U.S.C. 1905 and 41 U.S.C. 423.

Example 4: An employee of the Nuclear Regulatory Commission inadvertently includes a document that is exempt from disclosure with a group of documents released in response to a Freedom of Information Act request. Regardless of whether the document is used improperly, the employee's disclosure does not violate this section because it was not a knowing unauthorized disclosure made for the purpose of furthering a private interest.

Example 5: An employee of the Army Corps of Engineers is actively involved in the activities of an organization whose goals relate to protection of the environment. The employee may not, other than as permitted by agency procedures, give the organization or a newspaper reporter nonpublic information about long-range plans to build a particular dam.

§ 2635.704 Use of Government property.

(a) *Standard.* An employee has a duty to protect and conserve Government property and shall not use such property, or allow its use, for other than authorized purposes.

(b) *Definitions.* For purposes of this section:

(1) *Government property* includes any form of real or personal property in which the Government has an ownership, leasehold, or other property interest as well as any right or other intangible interest that is purchased with Government funds, including the services of contractor personnel. The term includes office supplies, telephone and other telecommunications equipment and services, the Government mails, automated data processing capabilities, printing and reproduction facilities, Government records, and Government vehicles.

(2) *Authorized purposes* are those purposes for which Government property is made available to members of the public or those purposes authorized in accordance with law or regulation.

Example 1: Under regulations of the General Services Administration at 41 CFR 101-35.201, an employee may make a personal long distance call charged to her personal calling card.

Example 2: An employee of the Commodity Futures Trading Commission whose office computer gives him access to a commercial service providing information for investors may not use that service for personal investment research.

Example 3: In accordance with Office of Personnel Management regulations at part 251 of this title, an attorney employed by the Department of Justice may be permitted to use her office word processor and agency photocopy equipment to prepare a paper to be presented at a conference sponsored by a professional association of which she is a member.

[57 FR 35042, Aug. 7, 1992, as amended at 62 FR 48748, Sept. 17, 1997]

§ 2635.705 Use of official time.

(a) *Use of an employee's own time.* Unless authorized in accordance with law or regulations to use such time for other purposes, an employee shall use official time in an honest effort to perform official duties. An employee not under a leave system, including a Presidential appointee exempted under 5 U.S.C. 6301(2), has an obligation to expend an honest effort and a reasonable proportion of his time in the performance of official duties.

Example 1: An employee of the Social Security Administration may use official time to engage in certain representational activities on behalf of the employee union of which she is a member. Under 5 U.S.C. 7131, this is a proper use of her official time even though it does not involve performance of her assigned duties as a disability claims examiner.

Example 2: A pharmacist employed by the Department of Veterans Affairs has been granted excused absence to participate as a speaker in a conference on drug abuse sponsored by the professional association to which he belongs. Although excused absence granted by an agency in accordance with guidance in chapter 630 of the Federal Personnel Manual allows an employee to be absent from his official duties without charge to his annual leave account, such absence is not on official time.

(b) *Use of a subordinate's time.* An employee shall not encourage, direct, coerce, or request a subordinate to use official time to perform activities other than those required in the performance of official duties or authorized in accordance with law or regulation.

Example 1: An employee of the Department of Housing and Urban Development may not ask his secretary to type his personal correspondence during duty hours. Further, directing or coercing a subordinate to perform such activities during nonduty hours constitutes an improper use of public office for private gain in violation of § 2635.702(a). Where the arrangement is entirely voluntary and appropriate compensation is paid, the secretary may type the correspondence at home on her own time. Where the compensation is not adequate, however, the arrangement would involve a gift to the superior in violation of the standards in subpart C of this part.

Subpart H—Outside Activities

§ 2635.801 Overview.

(a) This subpart contains provisions relating to outside employment, outside activities and personal financial obligations of employees that are in addition to the principles and standards set forth in other subparts of this part. Several of these provisions apply to uncompensated as well as to compensated outside activities.

(b) An employee who wishes to engage in outside employment or other outside activities must comply with all relevant provisions of this subpart, including, when applicable:

(1) The prohibition on outside employment or any other outside activity that conflicts with the employee's official duties;

(2) Any agency-specific requirement for prior approval of outside employment or activities;

(3) The limitations on receipt of outside earned income by certain Presidential appointees and other noncareer employees;

(4) The limitations on paid and unpaid service as an expert witness;

(5) The limitations on participation in professional organizations;

(6) The limitations on paid and unpaid teaching, speaking, and writing; and

ATTACHMENT 14: Drugs and Anesthetics

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:
AFR

NOV - 9 2000

Memorandum

To: Region 1 Fisheries Project Leaders

From: Assistant Regional Director, Fishery Resources

Subject: Guidance on Clove Oil and Other Fisheries Use Drugs and Chemicals

Hatcheries and other Fisheries offices within Region 1 may at times have legitimate and necessary reasons to use certain drugs and chemicals to achieve their goals and complete the mission and objectives of the Service. During the capture, rearing, or monitoring of fish species, several drugs and chemicals are used for anesthesia, disease treatments, or to increase the survival of the animals. Some of these compounds are already registered and labeled for fisheries use. Others may be legally used under the prescription and supervision of a veterinarian, or within the protocols of an existing Investigational New Animal Drug (INAD) exemption permit issued by the Food and Drug Administration (FDA). The Service has existing correspondence (see attached copy) from the FDA concerning the use of compounds in the recovery of threatened and endangered species, but there are certain restrictions even in those situations.

This document is intended to review the use of aquatic animal drugs for Fisheries Projects and provide guidance on their proper use in food animals. Attached are summaries of drugs and chemicals that are approved for aquatic animal use, considered Low Regulatory Priority for use in aquiculture, on the deferred regulatory list for aquiculture, and INAD permitted chemicals. Also attached are the FDA criteria for veterinary extra label use of approved human and animal drugs and a glossary of terms commonly used by FDA and others involved with the use of drugs and chemicals.

Region 1, working closely with the National INAD Office (NIO) and through appropriate consultation with FDA, will fully comply with all regulations and agreements for the use of aquatic drugs and chemicals. The inappropriate use of compounds on fish or aquatic animals intended for human or animal consumption is prohibited.

The use of clove oil as an anesthetic in food fish has been declared illegal by the Center for Veterinary Medicine (CVM) of the FDA. Until notified otherwise by the CVM, a fish is a food fish if it is reasonably likely that it will be consumed directly or indirectly by humans for food. Non-food fish salmon, steelhead, or trout are those to be rendered, buried, or released to the wild where they are not subject to harvest in legal fisheries. If a fish to be treated is not a food fish, then clove oil can be used as an anesthetic. However, juvenile fish cannot be anesthetized using

clove oil because of possible residual effects[1] (this excludes listed fish which are not harvested in legal fisheries as adults). If fish anesthetized with clove oil are rendered, the rendering plant operator who receives the fish must be notified in writing of this treatment; the same is true for MS-222 if its established 21-day withdrawal period is not observed. If the fish is outplanted, the Service must be assured that it will not be harvested in a legal fishery. These situations will be treated on a case-by-case basis and will need written approval from the Assistant Regional Director, Fishery Resources. Please notify your supervisor if you feel you have a non-food fish that would be appropriate for clove oil treatment.

The Service believes that its mission and goals can be achieved within the existing framework of allowable drug and chemical use, but recognizes the pressing needs for additional safe and effective drugs to facilitate recovery and restoration efforts. The Service continues to support the efforts of the National INAD Office, fisheries professionals, and the FDA by supplying data and working towards the registration and labeling of new chemotherapeutic compounds.

Attachment 1: Letter from FDA on the use of drugs in Threatened and Endangered Species
Attachment 2: Form TE-1, "Guide for Reporting Shipment/Receipt of Unapproved Drugs for Use on Threatened and Endangered Fish Species," and Form TE-2, "Chemical Use Log for the Use of Unapproved Drugs on Threatened and Endangered Fish Species."
Attachment 3: List of FDA Approved Compounds for Use in Aquatic Animals
Attachment 4: FDA Compliance Policy Guide 1240.4200: Drug use in Aquiculture Enforcement Priorities. Includes the lists of compounds FDA considers to be of Low Regulatory Priority, Deferred Regulatory Priority, and High Regulatory Priority for enforcement
Attachment 5: List of FDA INAD Permitted compounds and their sponsors
Attachment 6: FDA Compliance Policy Guide 1240.4210 Extralabel Use of Approved Drugs in Aquiculture
Attachment 7: Glossary of terms frequently encountered in chemotherapeutic compound registration and use.
Attachment 8: Clove oil fact sheet
Attachment 9: FDA Compliance Policy Guide 1240-4260: Classification of Aquaculture Species/Population as Food or Nonfood Animal
Attachment 10: Use of Unapproved Drugs in Culturing Endangered and Threatened Fish Species (02/06/96)
Attachment 11: Use of Unapproved Drugs in Culturing Endangered and Threatened Fish Species (03/04/96)

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[1]If a drug is not covered by an INAD exemption permit it has no established withdrawal period, or more precisely, the drug must be considered to be present in a residual form into adulthood when it is subject to harvest in a legal fishery. On the other hand, juvenile fish exposed to MS-222 or drugs under an INAD exemption permit that have an FDA-specified withdrawal time could be stocked immediately following treatment, as this period of time would elapse before the fish could be legally harvested.

3

cc:
Fisheries Line Supervisors (Dunn, Johnson, Hillwig, Zylstra)
Ed Forner, Chief, Hatcheries
Dave Erdahl, USFWS, Bozeman, Montana
Joy Evered, USFWS, Olympia FHC

ATTACHMENT 15: Fisheries Pest Management Policy

AFR

JAN - 3 2001

Memorandum

To: Fishery Project Leaders

From: Assistant Regional Director, Fishery Resources SIGNED BY DANIEL H. DIGGS

Subject: Fisheries Pest Management Policy

It is Fish and Wildlife Service (Service) policy to eliminate unnecessary use of pesticides by implementing integrated pest management techniques and by selecting crops and other vegetation that are beneficial to fish and wildlife but do not require pesticides. The ultimate goal is to eliminate pesticide use on Service lands and facilities and to encourage pest management programs that benefit trust resources and provide long-term, environmentally sound solutions to pest management problems on sites which are off Service lands.

When pesticides are used, they must be part of a pest management program that includes strategies to reduce and eventually eliminate their use. The program must be set forth in an Integrated Pest Management Plan which will be a part of the Comprehensive Hatchery Management Plan and must include consideration of target specificity of the pesticide (insecticide, fungicide, herbicide, etc.), risk to nontarget organisms, incidental reduction of food resources for trust species, persistence, control and prevention of the spread of fish and wildlife diseases, and other environmental hazards.

Land management practices must have high value for fish and wildlife resources, not encourage the exposure to pathogens or development of disease vectors that affect fish or wildlife resources, and they must utilize minimal or no hazardous chemicals. Internal endangered species review, including Section 7 consultation, must be completed for all pest management activities that may affect threatened or endangered species.

Endangered Species Act

Service personnel must be trained in integrated pest management. Those personnel who apply pesticides on Service lands must comply with the provisions of the Federal Insecticide, Fungicide and Rodenticide Act and the Endangered Species Act, Department and Service policy, and other applicable laws and regulations. All pesticides must be registered and may only be used in accordance with the pesticide label. Leftover pesticides, rinse water, and empty containers must be disposed of properly. All personnel involved with integrated pest and weed management on and off Service lands must participate in medical surveillance on an annual basis. This program is paid for by the Service from the Field Station budget. Instructions on medical surveillance will be issued in a separate memorandum. All pesticides labeled as

1/3/01
1-3-01
1/2/01
12/22/00
12/21/00
12-21-00
J. Anderson

"Restricted Use" and "Non-restricted Use" must be applied under the supervision of a certified Pesticide Applicator who holds a current and applicable State certification.

All proposed uses of pesticides and biological control agents, in quantities greater than general household use, on Service lands, facilities or in Service-funded projects will undergo review at the Regional and, if required, at the Departmental level. The exception is projects involving uses of disinfection agents for control of fish and wildlife pathogens and a few other minor exceptions. The Administrative Manual, 30 AM 12, attached, is the latest regulation on this topic and is to be used until new Service regulations are issued. The mechanism used to submit your plan (pesticide, biological controls, and other integrated, sustainable practices, such as herbicide use) for approval is called the PUP, or Pesticide Use Proposal. This request must be submitted at least 30 days prior to use to the Regional Office for review by the Regional Integrated Pest Management Coordinator in Refuges and Wildlife, with a copy to the Assistant Regional Director, Fishery Resources, and will be forwarded to the Washington Office if necessary. A blank PUP form is attached for your use.

If you have any questions, please call Chuck Eggleston at (503) 872-2763, or Scott Stenquist, the Regional Integrated Pest Management Coordinator in National Wildlife Refuges-Operations, at (503) 231-6172.

Attachments

CEggleston:jpa December 21, 2000
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