

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 as 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 (ESA) 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. This plan recognizes and complies with all management plans and Biological Opinions affecting the Columbia River Basin in general, and the Methow River Basin in particular.

Hatchery Purpose

Winthrop NFH was authorized by the Grand Coulee Fish Maintenance Project, April 3, 1937 and reauthorized by the Mitchell Act (52 Stat. 345), May 11, 1938 to compensate for fish losses caused by the construction of Grand Coulee Dam. Original production consisted of Chinook salmon trapped at Rock Island Dam, but since then has included several resident and anadromous salmonids. The hatchery is currently used for adult collection, egg incubation and rearing of spring Chinook salmon, steelhead trout, and coho salmon.

The following Hatchery Management Goals were adapted from the Mitchell Act, Endangered Species Act (ESA) Biological Opinions, U.S. v. Oregon agreements, and the Integrated Hatchery Operations Team – Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin, Volume III – Washington, Annual Report for 1995 (IHOT 1996).

Hatchery Goals

Goal 1: Produce fish species and numbers commensurate with those lost/affected by the construction of Grand Coulee Dam. Assure that hatchery operations support Columbia River Fish Management Plan (U.S. v. Oregon) production and harvest objectives.

Goal 2: Minimize impacts to ESA listed and other native species, their habitat, and the environment.

Goal 3: Provide the public with quality aquatic interpretation and education, customer service and comprehensive outreach to enhance public understanding, participation and support of Service and Winthrop NFH programs.

Hatchery Benefits

Harvest Contribution: Steelhead reared and released from Winthrop NFH have, over the last 4 years, supported successful sport fisheries in the Columbia and Methow Rivers. For example (WDFW)

Economic Benefit: During times of good ocean and river conditions that result in healthy adult returns, significant economic activity is generated through harvest of Winthrop NFH steelhead trout. For example in 2003, Washington Department of Fish and Wildlife estimated that _____ anglers fished a total of _____ hours during the Methow River special opener for steelhead (WDFW 2006 – **waiting for Jateff's data**).

In addition, the role of a Federal mitigation hatchery is to compensate for natural habitat lost to Federal hydro-power projects. It follows then, that the economic benefit of the mitigation hatchery is interwoven into the economic benefit of the hydro-power project/s being mitigated for and that the hatchery can be characterized as an operating expense of the hydro-power project. The Service recognizes that mitigation hatcheries serve a significant role in supporting economically important fisheries.

Planning Issues

Several federal, state, and tribal entities share responsibilities for development of sub-basin plans, hatchery production, harvest management, and ESA considerations. The CHMP recognizes and complies with all management plans and Biological Opinions affecting the Columbia River Basin, in general, and the Methow River Basin in particular. Operations at Winthrop NFH pose a number of potential issues in the watershed.

Marking:

- To help protect wild and naturally produced fish, the states of Washington, Oregon and Idaho are implementing selective sport and commercial fisheries (non-tribal) on marked hatchery fish.
- Columbia River Treaty Tribes generally disagree with the management strategy for mass marking and selective fisheries.
- The Service has not made any unilateral decisions on marking (although all juveniles released from Winthrop NFH are externally marked).

Juvenile salmon distribution and production numbers:

- Juvenile salmon are released from the hatchery in the spring as yearling smolts to promote quick downstream migration from the hatchery.
- The Yakama Nation has expressed an opinion that juvenile fish from the hatchery should be released throughout the watershed.

Water shortage (drought):

- During drought conditions the hatchery may need to make early releases of juvenile salmon and steelhead into the Methow River (although this has yet to happen).
- Conservation groups are highly concerned about potential actions undertaken by the hatchery to address drought conditions and their impact to listed salmonids.

Surplus adult salmon distribution:

- The Service, Yakama Nation, other agencies and conservation groups, would like to see plans developed to determine the number of salmon carcasses, if any, is suitable for stream enrichment, both dead and alive.

1.1 Purpose of and Need for Plan

The Winthrop National fish Hatchery (NFH) was placed in operation in 1942 with the intent to mitigate for the loss of salmon and steelhead spawning grounds above the impassable Grand Coulee Dam. The first groups of young fish were released from the hatchery in 1943. For the first few years of operation the production program involved only salmon and steelhead, but soon a trout rearing program was added for stocking state waters under a cooperative program with the Washington Department of Game. By 1951, the station was rearing sockeye, coho, kokanee and chinook salmon, and steelhead, brook, and rainbow trout. Later, cutthroat trout were added to the program. In 1967, the USFWS increased trout production at Winthrop to meet the stocking requirements of a program negotiated with the Colville Confederated Tribes (Colvilles) involving over a million brook, rainbow and cutthroat trout. That program and the cooperative stocking program with the Washington Department of Game continued until 1974 when the U. S. Fish and Wildlife Service (Service) recognized an urgent need to preserve and rehabilitate chinook salmon runs in the Upper Columbia Basin and returned the hatchery to salmon production. From 1974 until 1989, the station focused mainly on spring chinook salmon production, with trout for the Colvilles on a cost reimbursable basis. In 1989, the Colvilles assumed complete control of the trout program, with the construction of the Colville Tribal Trout Hatchery. Winthrop's programs are now dedicated primarily to ESA listed spring chinook salmon and summer steelhead. In recent years, the hatchery has become involved with a coho salmon reintroduction program initiated by the Yakama Nation (YN).

In the past, hatchery programs were allowed to evolve based on perceived needs and the capabilities of the facility. Today's hatchery programs are still dynamic and the origin of change is driven by public appeal, legislative mandates, judicial decrees, and the ESA. 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. The Service has 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. The Service has involved our cooperators in defining and evaluating our respective roles, and the Service continues to reach out to the general public, individual constituent groups, and local governments to explain our programs and initiatives. The Service has put in place a system of program evaluation that utilizes principles of adaptive management to integrate new information and expectations. All this and more is embodied in development of this plan. The journey of developing these plans, the research, analysis, thought, and outreach, is as important as the product itself. The Service looks into 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

The planning process began in August 2003 with establishment of the Winthrop CHMP Team, the core group responsible for drafting and revising the CHMP as it moves towards its anticipated completion in August 2006. The Team is composed of Service staff directly involved with the hatchery program. Additional coordination was provided by members from the Regional CHMP Steering Committee. The Steering Committee, composed of Service representatives from the Pacific Region, provided oversight to the CHMP process. In addition, the Steering Committee developed the general format and time line for completing the CHMP process, reviewed drafts of the Winthrop CHMP to ensure consistency with both the approved format and other CHMPs under development in Region 1, and ensured consistency with Regional and National goals of the Service Fishery Program.

1.3 Composition of Planning Team

The planning team was made up of Service representatives from the following offices:

Winthrop National Fish Hatchery
453A Twin Lakes Road
Winthrop, WA 98862
Chris Pasley, Plan Co-Lead

Leavenworth National Fish Hatchery Complex
12790 Fish Hatchery Rd.
Leavenworth, WA 98826
Steve Croci, Plan Co-Lead
Corky Broaddus (I&E)

Mid-Columbia River Fisheries Resource Office
12790 Fish Hatchery Rd.
Leavenworth, WA 98826

Brian Cates – Steering Committee Liaison
Dave Carie, Plan Co-Lead

Olympia Fish Health Center
3859 Martin Way E.
Suite 101
Olympia, WA 98506
Ray Brunson
Dr. Joy Evered

Regional Office - Fishery Resources
Eastside Federal Complex
911 NE 11th Ave.
Portland, OR 97232-4181
Rich Johnson Steering Committee Liaison

1.4 Review and Update of Plan

Because the biological, sociological, economic, and political environment is constantly changing, the role and responsibilities of Winthrop NFH can also be expected to change. It was the intent from the beginning that the CHMP would itself be dynamic to reflect that nature. Therefore, it was necessary to include a process for reviewing and updating the plan on a periodic basis. Review and updating will take place at least once every five years and will be the responsibility of the HET.

1.5 Fisheries Program Mission, Goals, and Priorities

Our National Fish Hatcheries 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 (Attachment 1: Map of U.S. Fish and Wildlife Service Pacific Region).

To provide long-term management direction for fishery resources, the Service in January 1985, issued its most complete description of priorities to date for the Fisheries Program in a document entitled, "Statement of Responsibilities & Roles" (U. S. Fish and Wildlife Service Fishery Resources Program, January 31, 1985). 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 revision to the Fisheries Program priorities was announced in November 1997. The Director approved and announced the following six priorities for the Service's Fishery Program:

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

Across the Nation, the Fisheries Program continues to be guided by these priorities, but there is an ongoing effort that, when completed, may revise these priorities. 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. When completed, these documents will set the new direction for the Fisheries Program and the role of National Fish Hatcheries in implementing program priorities.

1.6 National Fish Hatchery System - National/Regional 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. A little 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 National Fish Hatcheries were established under general authorizations for fisheries development as specified in appropriation acts. Then in the 1930's a series of acts provided authorizations for hatchery development. This permitted the National Fish Hatchery System to expand on a planned basis.

The Service has a 130-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.

A historical background into the establishment and operation of National Fish Hatcheries in Region 1 is provided in Attachment 2 (Note: Region 1 is the Pacific Region and includes Washington, Oregon, Idaho, California, Nevada, Hawaii and the Pacific Territories). Since the establishment of the first salmon hatchery on the McCloud River, 67 hatcheries or fish facilities have been established in California, Idaho, Oregon, and Washington. Only 19 of those hatcheries, 2 fish facilities, and 1 technology center are in operation today. The remainder have either been closed or transferred to State or other Federal agencies.

The development of a broad range of statutory mandates and authorities under which the Service conducts its hatchery program along with numerous other fishery related activities conducted in cooperation with other Federal, State, Tribal, and private entities is documented in Attachment 3. Vested with significant legal responsibilities under State and international agreements, 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 (ESA).

The Region 1 Fisheries Program consists of four major program activities: National Fish Hatcheries, Fish Health Centers, the Abernathy Fish Technology Center, 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 Salmon 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 assessment and restoration, non-indigenous

species coordination, natural production studies, harvest assessment, fish passage 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 interjurisdictional 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:

Implementing Hatchery Reform - National Fish Hatcheries are reforming hatchery practices to conform with 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).

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

Hatchery Evaluations - Monitoring and evaluation of hatchery production programs are a critical component of effective hatchery operations. Completion of hatchery management plans, including this one, will further identify research needs and assure quality.

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

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.

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.

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 at National Fish Hatcheries, other Service and non-Service lands.

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.

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, restoration, and recovery 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.

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

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.

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

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.

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 the Columbia River Basin are shaped by various policies, regulations, laws, agreements and legislative mandates. National Fish Hatchery managers and policy makers are constantly challenged with the complex task of implementing a comprehensive state-of-the-art hatchery program while complying with legal, regulatory, and legislative mandates which have different and sometimes conflicting purposes. For example, the Mitchell Act and subsequent amendments, Endangered Species Act and subsequent Biological Opinions, Treaty of 1855 with Columbia River Tribes, U.S. v Oregon court order of 1969 and subsequent Columbia River Fish Management Plan all guide production in the Columbia River. Chapters 2, 3 and 4 further discuss legal justification and operational guidance for Winthrop National Fish Hatchery.

CHAPTER 2. HATCHERY AND RESOURCE DESCRIPTIONS

2.1 Hatchery Overview

Winthrop NFH is located in north central Washington state, in Okanogan County. The 42-acre hatchery site lies 100 miles north of Wenatchee. The hatchery boundaries border on the city limits of the community of Winthrop. The Methow River flows through the northern edge of the property, directly above its confluence with the Chewuch River. The hatchery sits on developed river-bottom at river mile (RM) 50 on the Methow River which enters the Columbia River 524 miles upstream from the Pacific Ocean and 8 miles upstream from Wells Dam. Elevation of the facility is at 1755 ft. mean sea level (MSL), however the Methow drainage originates in the north Cascade Mountain Range, containing peaks within the Methow basin which reach elevations to nearly 9,000 ft. at Mt. Gardner, fourteen miles to the northwest.

Currently Winthrop NFH operates with a permanent staff of five full time employees (FTE's). This includes the Hatchery Manager, Assistant Hatchery Manager, two Animal Caretakers, and one Maintenance Worker. One temporary employee, hired on the Student Temporary Employment Program (STEP), usually works full time during the summer months and on weekends during the school year. Volunteers are utilized to assist with outreach activities and station operations when available.

2.2 Hatchery Purpose

Winthrop NFH was authorized by the Grand Coulee Fish Maintenance Project, April 3, 1937, and re-authorized by the Mitchell Act (52 Stat. 345), May 11, 1938. The Mitchell Act authorized the Secretary of Commerce "...to establish one or more salmon cultural stations in the Columbia Basin". The primary purpose of the hatchery was to mitigate for the blockage of salmon runs upstream of Grand Coulee Dam. The Winthrop NFH is one of three hatcheries which make up the Leavenworth National Fish Hatchery Complex (Complex). The Complex is administered from the main office in Leavenworth, Washington.

2.3 Facility and Site Descriptions

The hatchery has five buildings involved in fish production, three residences, and two large pond covers. Currently, there are no plans for new buildings; however, the hatchery would like to replace two severely deteriorated banks of raceways and include large roof structures. A description of hatchery buildings, their primary use, and improvements are listed in Attachment 5.

The hatchery's outdoor rearing units include 46 raceways, 16 Foster-Lucas ponds, and 2 adult holding ponds (see Attachment 6 for physical measurements of holding incubation and rearing units). The physical layout of the hatchery is diagramed in Attachment 7 and an

aerial photograph shows the hatchery in relation to the Methow River in Attachment 8.

Archeology / Cultural Resources

The Methow River Valley is part of the homeland of the Methow Tribe. Human occupation sites possibly 7,000 to 8,000 years old have been found. The Methow subbasin was also used by the Okanogan and Chelan Tribes. The area occupied by the Methows included the Methow River valley, and the area of the Columbia River shoreline between its junction with the Methow River and the mouth of the Okanogan River. It also included the upper Chewuch River drainage to the north of Winthrop, the areas north of Tiffany Mountain and Old Baldy on the east. These areas were also resource areas for the Northern Okanogan and the Southern Okanogans (USFS, 1994).

The Methow Tribe is now part of the Confederated Tribes of the Colville Reservation. By executive order, the Confederated Tribes were guaranteed rights to customary uses in the Methow Valley. The Yakama Nation also has treaty rights that influence the Methow Valley. Its rights guarantee its members fishing rights on the Columbia River. Since the Methow River flows directly into the Columbia, all activities in the Methow Valley that affect fish habitat, including water quality and quantity, must meet the treaty rights (USFS, 1994).

There are no known cultural resources on the Hatchery property. A survey was conducted prior to the removal of one of the hatchery residences in 1996. This report titled "Cultural Resource Report for the Removal of House #3 at Winthrop National Fish Hatchery" outlines the negative finding in detail.

Watershed/Ecosystem Setting

Much of the information provided below is derived from the Methow Subbasin Plan developed for the Northwest Power and Conservation Council in 2004.

General Description: The Methow subbasin is located in north central Washington State. The watershed rests entirely within Okanogan County and includes within its geographic scope the towns of Carlton, Mazama, Methow, Pateros, Twisp, and Winthrop. At its furthest reach the Methow subbasin extends about 68 miles from north-to-south and approximately 40 miles from east-to-west. The Basin is bordered on the west by the Cascade Mountains, on the north by Canada, on the east by the Buckhorn Mountains and the Okanogan River drainage, and on its southern edge by the Columbia River and the Sawtooth Ridge.

The Methow River flows southward from its headwaters on the eastern slopes of the Cascade Mountains, descending some 7,700 feet over the course of its 86-mile journey to

the Columbia River before entering the Columbia (RM 524) immediately south of the town of Pateros, Washington.

Geology: Roughly 50 to 65 million years ago the North Cascade subcontinent docked against the Okanogan subcontinent. As the two continents collided numerous north-to-south faults formed throughout the region that presently includes the Methow watershed. The dominant tectonic feature distinguishing the area is the Tertiary Methow-Pasayten Graben. Over millions of years, repeated occurrences of folding transformed and redefined the Methow-Pasayten Graben, with at least four distinct episodes culminating in the present geologic composition of the region.

The resulting bedrock geology of the Methow Valley area is characterized by folded Mesozoic sediments and volcanic rocks downfaulted between crystalline blocks. The sediment strata include varieties of sandstones, shales, siltstones, conglomerates and andesitic flows, breccias and tuffs. The crystalline rocks include various granitic type igneous intrusive rocks and high-grade metamorphic types, including gneiss, marble, and schist.

The valley's bedrock is overlain with a thick sequence of highly permeable unconsolidated sediment composed of pumice, ash, alluvium and glacial outwash. Geophysical surveys of mid-valley locations from Weeman Bridge (RM 62.2) to above Early Winters Creek (RM 67.5) indicate sediment depths between 800 to 1,200 feet (EMCON 1993). Those surveys also suggest a large fault structure with an offset of over 500 feet within the unconsolidated sediments which may influence groundwater flow (EMCON 1993). The majority of the Methow subbasin's aquifers rest within this unconsolidated sediment layer, confined from below by the relative impermeability of the underlying bedrock (EMCON 1993). Quartz and feldspar are the dominant minerals in the silt and sand fractions of sediment from the Methow River.

Climate and Hydrology: The Methow subbasin's climate is influenced by maritime weather patterns, elevation, topography, and its location on the leeward side of the Cascade Mountains. Pacific storms driven by prevailing westerly winds are routinely interrupted by the Cascade Mountains, dropping heavy precipitation throughout the upper elevations. Precipitation falls off significantly as elevation decreases and as the distance from the Cascade Crest increases. Continental weather patterns insinuate themselves periodically throughout the winter months, forcing blasts of cold air masses southward from Canada.

Nearly two-thirds of the watershed's annual precipitation occurs between October and March, arriving primarily as snow. In the summer, long spells of hot, dry weather are punctuated by intense, but short lived, thunderstorms. Fall brings increased precipitation which generally climaxes as winter snowfall between December and February. Snow usually blankets the ground from December through February at lower elevations, while at higher elevations snow cover lingers from October through June. The upper reaches of the watershed along the Cascade Crest (at elevations of approximately 8,600 feet) receive as

much as 80 inches of precipitation a year, this drops to about 60 inches in adjacent upland areas, while the town of Pateros (800 feet), at the far southern end of the subbasin, receives only about 10 inches of precipitation annually.

The Methow subbasin falls within the coldest of twenty-four western climate zones. The watershed is at the same latitude as Duluth, Minnesota, and Bangor, Maine. Additionally, temperatures within the basin are dictated by the fact that mean elevation within the basin is roughly a mile above sea level.

Winter low temperatures in the Methow range down to -35° F, with a monthly mean January temperatures, between 1970 and 1990 at Mazama, of 8.6° F. Average maximum temperatures in August for the upper watershed elevations range from 60° F to 70° F, with occasional highs up to 80° F. At lower elevations, August high temperatures range from 80° F to 95° F, with temperatures occasionally exceeding 100° F.

The Methow River near Pateros has a long-term mean discharge rate of 1600 cfs (45 m³/s) or a mean annual yield of 1.2 x 10⁶ acre-ft/yr (1400 x 10⁶ m³/yr). Average annual runoff from the Methow subbasin is 12 inches (31 cm). Snowmelt from the upper elevations of the Methow subbasin in spring and early summer generates most of the runoff in the basin with between 44 and 71% of the annual runoff volume occurring during May and June. Annual peak discharge occurs during May and June as well with the flood of record occurring on May 29, 1948 (Kimbrough et al. 2001). The timing of spring snowmelt is triggered by a combination of seasonal temperature changes and elevation. Low summer precipitation, higher temperatures, and declining snow pack contribute to receding streamflow beginning in July and continuing through September. The lowest streamflows occur in mid-winter (December to February) and early autumn (September) when streamflow is primarily the result of groundwater discharge, supplemented to a limited extent by snowmelt and storm runoff. During these periods, surface flow ceases in some streams and along reaches of rivers where streamflow is lost to groundwater, though the relationship between surface and ground water in the Methow subbasin is not fully understood.

Fish and Wildlife: A complete description of listed and candidate species which may occur in the area of the hatchery (Icicle Creek) are included in Attachment 9.

Three species of anadromous salmon, spring and summer Chinook (*Oncorhynchus tshawytscha*), sockeye (*O. nerka*), and summer steelhead (*O. mykiss*) are present in the Methow subbasin. Coho stocks (*O. kisutch*) were historically abundant in the subbasin but have been an extirpated stock since the early 1900's, although an effort is currently underway to reintroduce this species in the upper Columbia Basin. A number of other resident fish also occur throughout the subbasin, including bull trout (*Salvelinus confluentus*), which is present in fluvial, adfluvial, and resident life history forms (Attachment 10).

The rivers of the Methow subbasin historically were excellent salmonid producing streams. However, by the 1930's, the anadromous runs were decimated because of over-fishing in the lower Columbia River fisheries, irrigation diversion practices in the subbasin, and habitat

degradation related to poor mining practices, grazing and logging. By 1971, this situation was exacerbated by the construction of nine dams on the Columbia River between the mouth of the Columbia River and the confluence of the Methow River.

The Upper Columbia Evolutionarily Significant Unit (ESU) of spring Chinook was listed as endangered under the federal ESA on March 16, 1999. The Washington State Salmon and Steelhead Stock Inventory (SASSI) has identified four spring Chinook stocks in the Methow subbasin; the Twisp, Chewuch, Lost, and Methow River. A fifth stock, the Winthrop NFH stock is unlisted (Carson NFH ancestry) and in the process of being phased out.

The summer Chinook run in the upper Columbia is not listed under the ESA. Only one stock has been identified in the Methow subbasin, and is classified as “Depressed” based on escapement (SASSI).

Sockeye were once widespread and abundant in the Columbia River system, including the upper Columbia area now blocked by Grand Coulee Dam. Neither of the two stocks that remain in the upper Columbia region, the Wenatchee and Okanogan, are listed under the ESA. The SASSI lists both stocks as “Healthy” based on escapement.

The Upper Columbia ESU of summer steelhead was listed as endangered under the ESA on August 18, 1997. Only one stock was identified in the Methow subbasin (WDF/WDW 1993) and is classified as “Depressed” based on chronically low natural production.

The Upper Columbia Distinct Population Segment (DPS) of bull trout was listed as threatened under the ESA on June 12, 1998. The 1998 Bull Trout and Dolly Varden Appendix to the SASSI, identifies 17 bull trout stocks in the Methow subbasin (Andonaegui 2001). They are the Gold, Beaver, EF Buttermilk, WF Buttermilk, Twisp, Reynolds, Lake, Wolf, Goat, Early Winters, Cedar, Lost, Monument, Cougar, First Hidden, Middle Hidden, and Methow River. One of the 17 stocks has been classified as “Healthy” (Lost River) with the remaining 16 listed as “Unknown” based on the trend of abundance data available at the time the classifications were made.

The wide diversity of available habitats in the Methow River watershed indicates a high probability of diverse assemblages of wildlife species. Based on the habitat types found in the Methow subbasin, 15 amphibian species, 227 bird species, 90 mammal species, and 19 reptile species are thought to occur (WDFW 2002).

Vegetation: Listed and candidate species which may occur in the area of the hatchery are included in Attachment 9.

The Hatchery property lies near the transition zone of high desert and conifer on the east slope of the Cascade Mountain Range. Situated just below the forest zone, there are only a few ponderosa pine (*Pinus ponderosa*) trees on the property. Most existing vegetation is associated with riparian habitats and primarily consists of black cottonwood (*Populus*

trichocarpa), Scoulers willow (*Salix scouleriana*), mountain alder (*Alnus incana*), Woods rose (*Rosa woodsii*), serviceberry (*Amelanchier alnifolia*), black hawthorn (*Crataegus douglasii*), chokecherry (*Prunus virginiana*) and various grasses. Big sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*) occur in dry areas along with noxious weeds, such as knapweed (*Centaurea diffusa* and *C. repens*), Dalmatian toadflax (*Linaria dalmatica*), and tumbled mustard (*Sisymbrium altissimum*).

Habitat Condition: Stream surveys, sub-basin assessments, and watershed analyses have been used to evaluate factors limiting fish production in the Methow River. All watershed assessments indicate that fish production in the Methow River is primarily limited by habitat, water quantity, and fish passage at Columbia River Dams. Past riparian timber harvest, stream clean-outs, road building, and regeneration harvest within the rain or snow zone all have contributed to a decline in fish production. Many stream reaches were initially disturbed over one hundred years ago, therefore habitat and water quality are improving or in some cases have recovered. Habitat problems noted in the sub basin plan are mainly related to timber harvesting practices which are now very limited. Throughout the subbasin there continues to be a need to restore riparian vegetation to reduce water temperatures and peak flows, reduce sediment delivery to streams, and ensure continuous recruitment of large woody debris into the system.

Past, Current and Future Development: Agriculture and dairy farming became strong components of the economic structure of the Methow Valley in the early 1900's. There was enough summer precipitation to allow alfalfa to be grown without irrigation, and the winters were relatively mild, allowing easy over-wintering for the dairy cows (Chewuch Watershed Analysis, 1994).

The dairy industry lasted until about 1946 or 1947. The drought from 1919 to the early 1930's left many non-irrigated lands too dry to grow feed. Refrigeration had become very common, allowing milk products from larger, more cost-effective dairies to be delivered to the Valley. New government regulations controlling the sale of raw milk also drove some dairies out of business.

Apple orchards were also a big contributor to the economy in the Methow until the drought in the 1920's. Many of the ones that survived or were established after the drought were killed in the winter of 1968-69, when a record cold winter hit the valley. There are still several working orchards in the Methow Valley.

Cattle ranching and agriculture in the Methow Valley have been strong contributors to the local economy for many years. Many ranchers have grazed livestock on National Forest Service lands during the summer months for nearly a century. Agriculture on irrigated lands has provided feed for livestock. Even with the declines in the number of livestock grazing on National Forest Service lands, and the subdivision and sale of many agricultural lands, these industries have continued to be important to the local economy.

Mining contributed much to the local economy during the Slate Creek mining boom that began in 1893. This was short-lived, however, and after the boom passed in 1907, mining revenues made up only a small portion of the overall valley economic structure. Other than some small gravel pits, mining is practically non-existent in the Methow Valley at present.

The timber industry was a strong contributor to the economy for several decades. Many people in the valley were employed as timber harvesters, log truck drivers, or mill workers. The money they spent locally on groceries and supplies sustained the economy. When the mill in Twisp was closed in 1980, unemployment rose sharply. Many people still worked in the timber industry, mostly in jobs associated with timber harvesting, but there was less money to support the economy. The continued decline in the amount of timber sold in the Methow Valley has further weakened the local timber industry.

The opening of the North Cross State Highway and the westernization of Winthrop both helped strengthen the tourism and real estate industries. The tourism industry is growing, with a gradual increase in the number of people who visit every year. The recent increased interest in cross-country skiing, coupled with the great snowmobiling opportunities has extended the tourism season to year-round. The largest private employer in the valley is currently Sun Mountain Lodge, a destination lodge offering year-round recreation activities.

Real estate sales and prices have been on a steady increase for the past 20 years. The building and contracting industry has been increasing with the increased land sales, and now represents a large part of the valley economic structure.

The trends in the economic structure show an increase in tourism, construction, and real estate. The timber industry is expected to continue to decline, as is the grazing and agriculture industry. Mining, in the form of gravel pits, will continue to contribute a small amount to the economy.

History of Hatchery Stocks

Legal Authority - Winthrop NFH was authorized by the Grand Coulee Fish Maintenance Project, April 3, 1937 and reauthorized by the Mitchell Act (52 Stat. 345), May 11, 1938. The Mitchell Act authorized the Secretary of Commerce "...to establish one or more salmon cultural stations in the Columbia Basin in each of the states of Oregon, Washington, and Idaho." The hatchery is one of three mid-Columbia stations constructed by the Bureau of Reclamation (BOR) as fish mitigation facilities for the Grand Coulee Dam, Columbia Basin Project. Specific fishery objectives are stated in section 2.2. Although reauthorized by the Mitchell Act, funding was provided through a transfer of funds from the BOR to the Service until 1945. From 1945 to 1993, the Service had funding, management, and operation responsibilities for the Leavenworth NFH Complex (the Complex). Beginning on October 1, 1993, the BOR assumed funding responsibility for the Complex while the Service continues to manage and operate the three

facilities (Leavenworth, Entiat, and Winthrop NFH's).

In addition to the initial authorizations listed in Section 2.2, hatchery operations are authorized, sanctioned and influenced by the following treaties, judicial decisions and specific legislation:

- Treaty with the Walla Walla, Cayuse, Umatilla Tribes, 06/09/1855
- Treaty with the Yakama, 06/09/1855
- Treaty with the Nez Perce, 06/25/1855
- Treaty with the Tribes of Middle Oregon, 06/25/1855
- Executive Order (Treaty with Bands of Colville), 04/08/1872
- U.s. v. Oregon (Sohappy v. Smith, "Belloni Decision", Case 899), 07/08/1969
- Endangered Species Act of 1973, 87 Stat. 884, 12/28/1973
- Salmon and Steelhead Conservation and Enhancement Act, 94 Stat. 3299, 12/22/1980
- Pacific Salmon Treaty Act of 1985 (U.S./Canada Pacific Salmon Treaty), Public Law 99-5, 16 U.S.C. 3631, 03/15/1985

Production and Management History: From 1899 through 1914 a hatchery was operated at Twisp by the State of Washington and the Okanogan County Game Commission (Bryant and Parkhurst, 1950). This hatchery collected as many as 2,000,000 coho salmon eggs and about 70,000 chinook eggs annually. In 1915, the Washington Water Power Company constructed a dam at Pateros near the mouth of the river which was not provided with fishways of any kind. Since the dam was impassable, no fish could reach the hatchery and therefore it was moved downstream to the dam site. Coho salmon eggs were taken at this new location, although smaller numbers than previously, and in addition 2 to 4 million steelhead eggs were handled by the hatchery during this time as the run had been virtually exterminated (Bryant and Parkhurst, 1950).

Egg collection was discontinued at this location in 1921. Several attempts were made during the period from 1926 to 1931 to introduce Chinook salmon from other hatcheries. These fish were nearly all late fall-run salmon taken from tributaries relatively low on the Columbia River system, and apparently there was no return to the Methow River from these plantings. By 1930, when the power dam at Pateros had been removed, the run of coho salmon had all but disappeared, and the run of steelhead was very small. At the time of the first stream survey in 1935, a few spring Chinook salmon were seen in the main Methow and some of its tributaries (Bryant and Parkhurst, 1950).

Fish cultural operations were initiated at Winthrop NFH in 1942. Adult sockeye salmon, chinook salmon and steelhead were trapped at Rock Island Dam, transported to the Winthrop holding pond, and held there for spawning. The first groups of young fish were released from the hatchery in 1943. For the first few years of operation the production program involved only salmon and steelhead, but soon a trout rearing program was added for stocking state waters under a cooperative program with the Washington Department of

Game. By 1951, the station was rearing sockeye, coho, kokanee and chinook salmon, and steelhead, brook, and rainbow trout. Later, cutthroat trout were added to the program.

Many disease, water quality and technical problems were encountered in the production of sockeye, chinook, and steelhead during the hatchery's early years of operation. Losses of young fish in some years were catastrophic. Eventually, in 1969, anadromous fish program was terminated altogether, due to the serious production problems encountered. (Sockeye production was discontinued in 1961, chinook in 1963, steelhead in 1966, and coho salmon in 1969.)

In 1967, the FWS increased trout production at Winthrop to meet the stocking requirements of a new cooperative fishery assistance/stocking program negotiated with the Colville Indian Nation, involving over a million brook, cutthroat, and rainbow trout. This program and the cooperative stocking program with the Washington Department of Game were continued until 1974, at which time a change in National hatchery objectives and priorities and a recognition of an urgent need to preserve and rehabilitate chinook salmon runs in the upper Columbia basin, resulted in the Winthrop hatchery being returned to salmon production. The station then focused on spring and summer chinook salmon production with trout for Colville Indian Reservation waters on a cost reimbursable basis. Due to poor adult return rates, and low survival rates of imported eggs, the last year of the summer chinook production was 1982. The Colville trout program was terminated 7 years later with the completion of the new Colville resident trout hatchery which came on line in 1989.

Currently, the Winthrop hatchery produces 600,000 spring chinook salmon (SCS) smolts averaging 13-18 fish per pound and weighing about 40,000 lbs. These fish are released into the Methow River in April of each year.

Wells stock summer steelhead were brought to Winthrop NFH in 1995. The program has continued with an annual release of 100,000 steelhead smolts to the Methow River at Winthrop NFH.

An agreement was negotiated with the Yakama Nation (YN) in 1995 to explore the feasibility of restoring coho salmon to the Methow River System. The agreement has resulted in several recent releases of coho salmon from the Winthrop hatchery. Today approximately 250,000 coho are reared and released from Winthrop NFH.

Biological Risks and Ecological Interactions Between Hatchery (non-listed) Spring Chinook Salmon, Coho salmon and Wild (listed) Summer Steelhead, Spring Chinook Salmon and Bull Trout.

All hatcheries must consider their potential for adversely affecting the aquatic community. To help assess potential impacts, the Service has developed several Biological Assessments (BA),

and currently is in the “Phase II” portion of drafting Hatchery and Genetic Management Plans (HGMP) for fish hatcheries in the upper-Columbia River, including Winthrop NFH. These management plans were drafted to assess our program and meet Endangered Species Act requirements identified by NOAA Fisheries and the Service. It is anticipated that the HGMP’s will be updated regularly and re-submitted to NOAA Fisheries and the Service. In the upper-Columbia Basin, the initial BA (1994) covered potential hatchery impacts to listed Snake River sockeye and spring, summer, and fall Chinook salmon. Since this original BA, the Service has crafted BA’s to cover listed upper-Columbia River summer steelhead (1997), listed and unlisted spring Chinook salmon (1999), and bull trout (1999). While these documents fulfilled the requirements under the ESA, they have recently been replaced with the HGMP’s to better describe the programs and their potential impacts. These impacts include: water withdrawal and effluent discharge, broodstock collection, genetic introgression, juvenile fish releases, disease, competition, predation, residualism, and migration corridor and ocean impacts. NOAA Fisheries determination to date is that “the federal artificial propagation programs proposed for operation of funding by the USFWS and BPA in the UCR basin are not likely to jeopardize the continued existence of these listed ESU’s or to destroy or adversely modify their habitat.”

In addition to completing documentation to comply with our ESA responsibilities, we must also meet our mitigation responsibilities under the Mitchell Act as well as our Tribal Trust and U.S. v. Oregon obligations. In order to balance these sometimes conflicting mandates, we regularly meet with our co-managers to discuss operation and management of the hatchery.

The following information was extracted primarily from our November 2002 Draft HGMP and summarizes biological risks and ecological interactions between hatchery (non-listed) spring Chinook salmon and wild (listed) summer steelhead, spring Chinook, and bull trout. This document is available at the hatchery.

Hatchery Water Intake and Use: The main water source for the Winthrop NFH is the Methow River, from which the hatchery has the right to 50 cubic feet per second (cfs). Spring Branch Springs and a system of infiltration galleries provide a lesser amount of water (approximately 17 cfs combined water flow). The infiltration galleries are of great importance to the success of the hatchery because they provide a warmer flow essential for fish production during the cold winter months, and they also provide a relatively pathogen free water source, which is beneficial to egg incubation and early rearing.

In 1989, a change in the Methow River Water Right was negotiated with the Washington Department of Ecology. The negotiation allows the Washington Department of Fish and Wildlife hatchery to use up to 7 cfs of water in the event of an emergency water shortage at the State facility, provided the flow is not required at the Winthrop NFH.

Ground water temperatures in the nursery range between 47-52 degrees F. Spring Branch Spring also provides water in the same temperature range which is used as a direct source only as a last resort in the outside rearing units. However, this water does mix with the

Foghorn Ditch water above the Winthrop NFH intake. Therefore, the river source does include a small percentage of Spring Branch Spring water. The Methow River source is the main supply for the outside rearing units during the winter months, and is very susceptible to temperature swings with seasonal fluctuations from as low as 32-33 degrees F in December to as high as 67 degrees F in August. Since the river water contains the most pathogens, use of this source is usually avoided during early rearing of all salmonids. Gallery #2 is often utilized in the winter to help alleviate ice and slush build-up, and to attempt to maintain a temperature at which salmon can actively metabolize feed.

The Foghorn diversion dam on the Methow River is a rock and boulder structure which backs up the river in order to divert multi-purpose water to the Foghorn Ditch. The structure has existed in some form for irrigation purposes long before the construction of the hatchery in 1938. Adjacent to the dam on the south shoreline a diversion structure serves to collect water for the Foghorn Ditch and provides fish passage around the dam by means of a fish ladder. The structure also has an adult salmon trap built in for the purpose of collecting wild adult salmon, however this trap has proven to be ineffective since the dam is really not a fish barrier during most of the year.

All users of surface water in the Methow subbasin are required to have fish screening devices built in to protect threatened, endangered, and unlisted wild fishes. The hatchery owns and operates two such structures on the Foghorn Ditch. The Foghorn Irrigation screen is located just below the hatchery intake and has recently been reconstructed to meet strict requirements developed by NOAA Fisheries and the Washington Department of Ecology. The Winthrop NFH fish screen has also been recently reconstructed to meet these requirements. Both screens are rotary type drum screens which guide fish into a bypass channel which runs behind the hatchery and returns wild fish to the Methow River.

Broodstock Collection: There is no barrier dam in the Methow River at the hatchery. This is significant because the Methow River watershed upstream of the hatchery is an important spawning and rearing area for native spring Chinook salmon, summer steelhead trout, and bull trout (all listed).

Spring Chinook Salmon - The first returning adult spring Chinook salmon usually appear in the fish ladder or holding pond by the middle of May. The bulk of the run will arrive in June, with a few additional fish trickling in all summer. Returning adults come back to the hatchery via the bypass/discharge channel which flows into the Methow River approximately 1/4 mile below the hatchery. The trap and the holding pond now being used is the unfinished adult facility built in 1985 and modified for safety and efficiency in 1998.

During the late 1990's, most adult SCS were trapped at Wells Dam due to record low numbers returning. In this case, the fish are transported and held at the Methow SFH until origin is determined, usually at spawning. Those fish determined to be of Winthrop origin are received as green eggs or as live adults, depending on whether the fish have a coded wire tag or are unmarked hatchery fish.

In recent years, the phase out of the Carson stock spring Chinook salmon at Winthrop NFH has resulted in some modified approaches to collecting spring Chinook for the hatchery's broodstock. Early in the phase out, collection plans included racking off the hatchery discharge channel to block entrance of the Carson stock to the facility and collecting localized, Methow Composite, stock from the outfall channel at the Methow SFH. Only since 2003, has the hatchery been able to return to operating its fish ladder and collect fish returning to the hatchery as the pure Carson stock were no longer in the river system.

Steelhead - Current brood stock is acquired from the Wells Dam State Fish Hatchery. Eyed eggs taken from throughout the run are transferred to Winthrop NFH in March. This requires about 110,000 eyed eggs to produce 100,000 smolts for release. The ability to trap wild steelhead at Wells Dam allows for the incorporation of wild steelhead into the broodstock used for hatchery programs on the Methow River. Since few or no wild steelhead would be expected to enter the Winthrop NFH fish ladder and the fact that run and collection timing would be several months later, there are no plans to collect and spawn adult steelhead at Winthrop NFH.

Coho Salmon – Depending on run size, adult coho can either be trapped at Wells Dam and/or allowed to ascend the Methow River on their own. Trapped fish are transported by a 400 gallon tank truck in groups of 20 or less to the Winthrop NFH adult holding facility. The Winthrop NFH fish ladder is also opened in late September or the first of October and allowed to attract and collect fish throughout the run.

Genetic Introgression: Coded-wire tag recoveries indicate that returning adults of WNFH origin have a high fidelity to the Methow River system. Few adults are recovered outside of the Methow Basin. The majority of spring Chinook salmon reared at WNFH are now listed as endangered and therefore adult fish in excess to brood stock needs are not taken into the facility and are considered to be genetically similar to the naturally spawning population. Therefore, genetic introgression of spring Chinook released from Winthrop NFH with other spring Chinook stocks is not considered a significant problem. The Service has marked 100% of the juveniles released from Winthrop NFH since 1994 to better quantify the degree of straying (potential genetic introgression) of returning adults.

Hatchery Production: Winthrop NFH Spring Chinook releases are moderate in magnitude relative to other Columbia River Spring Chinook production programs. Winthrop NFH releases changed over the years due to density dependent effects, virulent pathogen present in surface water, other potential ecological effects on other natural stocks and harvest management objectives.

Recent information from PIT tags indicate the release of steelhead and spring Chinook salmon smolts emigrate from the Methow and Columbia rivers fairly quickly (TABLE X) potentially reducing any density dependant effects. The Service will continue to evaluate

our release strategies and production numbers to minimize any negative effect upon the aquatic community, especially on listed species.

Disease: Hatchery programs are routinely monitored to prevent and subsequently treat fish in response to disease outbreaks that occur. Most pathogens now enter hatcheries through returning adult fish, surface water supplies, and other mechanisms involving direct contact with naturally spawning fish. Crowding and stress decrease the physiological resistance of salmonid fishes to disease and increase the likelihood of infection (Salonius and Iwama 1993; Schreck et al. 1993). Consequently, concern exists that the release of hatchery fish may increase the risk of disease in naturally spawning populations. Fish managers largely understand the kinds, abundance and virulence (epidemiology) of pathogens and parasites in hatchery fish. Recent studies suggest that the incidence of some pathogens in naturally spawning populations may be higher than in hatchery populations (Elliot and Pascho 1994). Indeed, the incidence of high ELISA titers for *Renibacterium salmoninarum*, the causative agent of Bacterial Kidney Disease (BKD), appears, in general, to be significantly more prevalent among wild smolts of spring/summer Chinook salmon than hatchery smolts (Congleton et al. 1995; Elliot et al. 1997). For example, 95% versus 68% of wild and hatchery smolts, respectively, at Lower Granite Dam in 1995 had detectable levels of *R. salmoninarum* (Congleton et al. 1995). Although pathogens may cause significant post-release mortality among hatchery fish, there is little evidence that hatchery origin fish routinely infect naturally produced salmon and steelhead in the Pacific Northwest (Enhancement Planning Team 1986; Steward and Bjornn 1990). Many biologists believe disease-related losses often go undetected, and that the impact of disease on naturally spawning populations may be underestimated (Goede 1986; Steward and Bjornn 1990). Nevertheless, the Service is unaware of any studies or scientific literature that show hatchery fish infecting a naturally spawning population of salmon or steelhead in the Pacific Northwest, however more research is needed.

Winthrop NFH follows Integrated Hatchery Operations Team (IHOT 1995) and Pacific Northwest Fish Health Protection Committee protocols for disease sampling and treatment.

The Olympia Fish Health Center is located in Olympia, WA. Fish health sampling, diagnosis, and treatment are performed monthly and are available as fish health issues arise. Chapter 3 provides more detail on Fish Health practices. The fish health goal for Winthrop NFH is to release healthy fish that are physiologically ready to migrate.

Winthrop NFH Spring Chinook, steelhead and Coho are released directly into the Methow River at the hatchery site and navigate nine Columbia River dams en route to the ocean.

Winthrop NFH Spring Chinook, steelhead and Coho have an increased potential for suffering from disease due to impacts and stresses of collection for transport and/or diversion through multiple bypass systems. Disease transmission is believed to be triggered by increased population density and unusual changes in environment such as would occur at transport collection facilities and juvenile bypass systems.

Our general conclusion at this time is that the Winthrop NFH is, as are all federal hatcheries in the Columbia River Basin, currently taking extensive measures to control disease and the release of diseased fish. As a consequence, infection of natural fish by

hatchery fish is being minimized. Based on the relative prevalence of BKD among hatchery and wild Chinook salmon (Elliot et al. 1997; Congleton et al. 1995), the crowding and handling of fish at transportation dams at the time of barging or bypass may have a greater likelihood of increasing the incidence of disease among naturally produced fish than direct infection from hatchery fish.

Competition: The impacts from competition are assumed to be greatest in the spawning and nursery areas at points of highest density (release areas) and diminish as hatchery smolts disperse (USFWS 1994). Salmon and steelhead smolts actively feed during their downstream migration (Becker 1973; Muir and Emmett 1988; Sager and Glova 1988). Competition in reservoirs could occur where food supplies are inadequate for migrating salmon and steelhead. However, the degree to which smolt performance and survival are affected by insufficient food supplies is unknown (Muir et. al. 1994). On the other hand, the available data are more consistent with the alternative hypothesis that hatchery-produced smolts are at a competitive disadvantage relative to naturally produced fish in tributaries and free-flowing main stem sections (Steward and Bjornn 1990). Although limited information exists, available data reveal no significant relationship between level of crowding and condition of fish at main stem dams. Consequently, survival of natural smolts during passage at main stem dams does not appear to be affected directly by the number (or density) of hatchery smolts passing through the system at present population levels. While smolts may be delayed at main stem dams, the general consensus is that smolts do not normally compete for space when swimming through the bypass facilities (Enhancement Planning Team 1986). The main factor causing mortality during bypass appears to be confinement and handling in the bypass facilities, not the number of fish being bypassed.

Juvenile salmon and steelhead, of both natural and hatchery origin, rear for varying lengths of time in the Columbia River estuary and pre-estuary before moving out to sea. The intensity and magnitude of competition in the area depends on location and duration of estuarine residence for the various species of fish. Research suggests, for some species, a negative correlation between size of fish and residence time in the estuary (Simenstad et. al. 1982).

While competition may occur between natural and hatchery juvenile salmonids in, or immediately above the Columbia River estuary, few studies have been conducted to evaluate the extent of this potential problem (Dawley et. al. 1986). The general conclusion is that competition may occur between natural and hatchery salmonid juveniles in the Columbia River estuary, particularly in years when ocean productivity is low. Competition may affect survival and growth of juveniles and thus affect subsequent abundance of returning adults. However, these are postulated effects that have not been quantified or well documented.

The release of hatchery smolts that are physiologically ready to migrate is expected to minimize competitive interactions as they should quickly migrate from the release site. Winthrop NFH Spring Chinook, steelhead and Coho are released into the Methow River at the hatchery site and migrate quickly into the main stem Columbia River migration

corridor en route to the ocean based on juvenile out-migrant trapping and PIT tag monitoring at McNary Dam (see Chapter 3), reducing potential competitive interactions within the Methow River basin.

Predation: The Service presented information that salmonid predators are generally thought to prey on fish approximately one-third or less their size (USFWS 1994). Depending on species and population, hatchery smolts are often released at a size that is greater than their naturally-produced counterparts. In addition, for species that typically smolt at one year of age or older (e.g. Steelhead and Spring Chinook salmon), hatchery-origin smolts may displace younger year classes of naturally-produced fish from their territorial feeding areas. Both factors could lead to predation by hatchery fish on naturally produced fish, but these effects have not been extensively documented, nor are the effects consistent (Steward and Bjornn 1990). A primary concern is the potential impact of predation by residualized hatchery steelhead on naturally-spawning populations.

In general, the extent to which salmon and steelhead smolts of hatchery origin prey on fry from naturally reproducing populations is not known, particularly in the Columbia River basin. The available information, while limited, is consistent with the hypothesis that predation by hatchery-origin fish is, most likely, not a major source of mortality to naturally reproducing populations, at least in freshwater environments of the Columbia River basin (Enhancement Planning Team 1986). However, virtually no information exists regarding the potential for such interactions in the marine environment.

There is little potential for Winthrop NFH Spring Chinook to prey on natural steelhead fry or parr in the Methow River. Based on time of spawning, steelhead fry would be emerging from the gravel after hatchery origin Chinook had exited the river. In addition, much of the spawning and early rearing stage (egg to parr) production areas for natural populations of Methow River steelhead are in the tributaries and upper basin areas above the Winthrop NFH. However, the life history rearing stage for steelhead, age-1 parr to age-2 smolt, does occur below the hatchery with the parr moving into the area as smolts vacate the area during their annual migration which peaks in mid-May.

Winthrop NFH fish releases may contribute to indirect predation effects on listed stocks by attracting predators (birds, fish, pinnipeds) and/or by providing a large forage base to sustain predator populations. Releasing large numbers of hatchery fish may lead to a shift in the density or behavior of non-salmonid predators, thus increasing predation on naturally reproducing populations. Conversely, large numbers of hatchery fish may mask or buffer the presence of naturally produced fish, thus providing sufficient distraction to allow natural juveniles to escape (Park 1993). Prey densities at which consumption rates are highest, such as northern pikeminnow in the tailraces of main stem dams (Beamesderfer et. al. 1996; Isaak and Bjornn 1996), have the greatest potential for adversely affecting the viability of naturally reproducing populations, similar to the effects of mixed fisheries on hatchery and wild fish. However, hatchery fish may be substantially more susceptible to predation than naturally produced fish, particularly at the juvenile and smolt stages (Piggins and Mills 1985; Olla et. al. 1993).

Predation by birds and marine mammals (e.g. seals and sea lions) may also be significant source of mortality to juvenile salmonid fishes, but functional relationships between the abundance of smolts and rates of predation have not been demonstrated. Nevertheless, shorebirds, marine fish, and marine mammals (NMFS 1997) can be significant predators of hatchery fish immediately below dams and in estuaries (Bayer 1986; Ruggerone 1986; Beamish et al. 1992; Park 1993; Collis et al. 2001). Unfortunately, the degree to which adding large numbers of hatchery smolts affects predation on naturally produced fish in the Columbia River estuary and marine environments is unknown, although many of the caveats associated with predation by northern pikeminnow in freshwater are true also for marine predators in saltwater.

Residualism: Spring Chinook salmon and coho salmon released from Winthrop NFH are not known to residualize in the Methow River. Available out-migrant trap and PIT tag monitoring information indicate a rapid exit of Winthrop NFH Spring Chinook from the Methow River (see Chapter 3 Monitoring and Evaluation discussion).

PIT tag data has shown a very small percentage of steelhead trout released from Winthrop NFH to reside in the Methow River system for an additional year before migrating to the ocean. The normal life cycle for upper Columbia River summer steelhead is to reside for 2 or more years in freshwater prior to migrating to the ocean. This life trait is not expected to change for all hatchery reared fish, however it is minimized by growing hatchery steelhead to a size where the vast majority of the population is large enough to go through the physiological changes needed for smoltification, and hence migration to the ocean.

Migration Corridor/Ocean: The Columbia River hatchery production ceiling called for in the Proposed Recovery Plan for Snake River Salmon of approximately 197.4 million fish (1994 release levels) has been incorporated by NOAA Fisheries into their recent hatchery biological opinions to address potential main stem corridor and ocean effects as well as other potential ecological effects from hatchery fish. Although hatchery releases occur throughout the year, approximately 80 percent occur from April to June (NMFS 1999a) and Columbia River out-migration occurs primarily from April through August. Winthrop NFH's spring Chinook, steelhead and Coho production is released in April at the beginning of the normal hatchery and natural stock out-migration season. The total number of hatchery fish released in the Columbia River basin has declined by about 26 percent since 1994 (NMFS 1999c) reducing potential ecological interactions throughout the basin.

Ocean rearing conditions are dynamic. Consequently, fish culture programs might cause density-dependent effects during years of low ocean productivity, especially in near shore 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 near shore 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 northeastern part of the 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).

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; and 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.

Harvest: Some adult steelhead and salmon returning to Winthrop NFH are harvested in the mixed stock tribal and sport fisheries in the lower Columbia River and many returning steelhead are harvested in the terminal sport fisheries in the Methow River. This activity is directed by WDFW and the state must consult on these fisheries annually, prior to harvest. The Yakama Nation, in cooperation with WDFW, sets tribal fishing seasons and limits.

Beneficial Uses (historic and present cultural and public uses, fishery benefits, harvest contribution, economic value)

Public Uses: Winthrop NFH accommodates visitors on a regular basis and for their convenience provides a comfort station (restrooms) and a picnic area with gazebo near the settling pond. The Methow Valley Sports Trail Association uses a small portion of the hatchery grounds for a cross country ski trail.

The main public event at Winthrop NFH is Kid's Fishing Day. The original event was conceived by personnel from the USDA Forest Service in cooperation with the Winthrop NFH and was realized on a Saturday in June of 1989. This popular event draws 400 to 500 people each year. The event is always on a Saturday during National Fishing Week.

Harvest Contribution: Spring Chinook salmon from Winthrop NFH have not, over the years, supported successful sport and tribal fisheries in the Columbia and Methow rivers. Fisheries occur almost exclusively in the Lower Columbia with the majority of fish harvested in the freshwater sport fishery, followed by tribal treaty and Columbia River gill net fisheries (Refer to Chapter 3 for more discussion on harvest).

Summer steelhead trout released from Winthrop NFH have, over the last 4 years, provided marked hatchery fish for special sport fishing openers on the Methow River. The WDFW has not adipose fin clipped (for recovery purposes) most of its steelhead released from Wells Dam SFH to the Methow River system, however they have requested that all steelhead released from Winthrop NFH be adipose fin clipped to provide fish for sport harvest on years when return numbers exceed desired escapement goals.

Economic Benefit: When attempting to estimate the benefits of an anadromous fish hatchery, environmental conditions outside the hatchery are cyclic and beyond the control of hatchery administrators (e.g. ocean conditions). This environmental variability can subsequently affect post-release survival of juveniles and number of adult returns. During times of "good ocean and river conditions" that result in healthy adult returns, significant economic activity is generated through harvest of Winthrop NFH summer steelhead trout and, to a lesser degree, spring Chinook salmon.

In addition, the role of a Federal mitigation hatchery is to compensate for natural habitat lost to Federal hydro-projects. It follows then, that the economic benefit of the mitigation hatchery is interwoven into the economic benefit of the hydro-power project/s being mitigated for and that the hatchery can be characterized as an operating expense of the hydro-power project. The Service recognizes that mitigation hatcheries are extremely important in supporting economically important fisheries.

Cultural Values: The Yakama Nation shares the in-river harvest of spring Chinook salmon returning to Winthrop NFH and is the primary beneficiary of spring Chinook salmon which enter the lower Columbia River. The cultural significance of these fish to the tribes can be characterized by the following quotations:

For the Yakama people salmon is seen as one of the gifts from the Creator. Since the beginning of time the Yakama people have relied upon salmon as well as the roots, berries, deer, elk and herbal medicines

still important today. When the Yakama people were placed on this part of Mother Earth they were told by the Creator that He was going to give us some gifts. Those gifts came in the form of salmon and other natural resources.

He also instructed the Yakama people on how to care for the resources and warned that if any of the resources disappear, then we too as people, would disappear. That is why the Yakama people continually care for the salmon, the deer, the elk, the roots, the berries and the herbal medicines. We are also taught at a very young age that we are not here on Mother Earth to live and go away. Our Yakama elders tell us that we are only borrowing the water, the salmon, the Yakama language and everything else as we are preparing for the up and coming generations, it's like remembering the future." (Carol Craig; Yakama Nation Fisheries Resource Management; Public Information Officer; personal communication.)

Salmon was presented to me and my family through our religion as our brother, the same with the deer. And our sisters are the roots and berries. And you would treat them as such. Their life to you is just as important as another person would be." (Margeret Saluskin; Yakama Nation; Columbia River Inter-Tribal Fish Commission Web-Page.)

CHAPTER 3. HATCHERY AND RESOURCE MANAGEMENT

3.1 Hatchery Goals, Objectives, and Tasks

The following Hatchery Management Goals were adapted from the Mitchell Act, Endangered Species Act (ESA) Biological Opinions, U.S. v. Oregon agreements, and the Integrated Hatchery Operations Team – Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin, Volume III – Washington, Annual Report for 1995 (IHOT 1996).

Goal 1: Produce fish species and numbers commensurate with those lost/affected by the construction of Grand Coulee Dam. Assure that hatchery operations support Columbia River Fish Management Plan (U.S. v. Oregon) production and harvest objectives.

Objective 1: Produce sufficient spring Chinook smolts to result in adult returns in excess of desired hatchery escapement.

Task 1: Collect and spawn sufficient brood stock (adults) to achieve desired juvenile release goal.

Task 2: Incubate eggs and rear juveniles using best management practices to reduce and eliminate diseases, optimize physiological fitness and obtain maximum survival of released smolts.

Task 3: Release or transport smolts using best methodologies to assure optimum survival during out-migration.

Objective 2: Assure that LNFH, in conjunction with Entiat and Winthrop NFH's, are fully mitigating (within their means) for anadromous fish losses caused by Grand Coulee Dam.

Task 1: Assess types of anadromous fish species affected by the construction of Grand Coulee Dam.

Task 2: Determine if current production numbers are sufficiently contributing to the mitigation goals, i.e., public fisheries, etc.

Task 3: Participate in the development of and ensure compliance with fishery management plans that establish production targets.

Objective 3: Contribute to a meaningful harvest for sport, tribal, and commercial fisheries annually in the Columbia and Methow Rivers (achieve an average of 0.5% smolt to adult survival, harvest plus escapement).

Task 1: Work with states and tribes to establish meaningful fisheries (through U.S. v. Oregon forums or other management agreements).

Task 2: Mass mark juvenile hatchery fish prior to release to enable state agencies to implement desired fisheries and to evaluate the effectiveness of the hatchery program.

Objective 4: Work with interested parties to manage adult fish returning in excess of brood stock needs and those available for harvest.

Task 1: When feasible, utilize surplus adults to meet fishery conservation and recovery needs within and outside the Methow Subbasin.

Task 2: Donate surplus adults that enter the hatchery to tribes for ceremonial and subsistence purposes.

Objective 5: Meet tribal trust responsibilities.

Task 1: Follow pertinent Laws, Agreements, Policies and Executive Orders and Consultation and Coordination with Native American Tribes.

Task 2: Hold an annual coordination meeting between the Service and Yakama Nation to identify and report on issues of interest and coordinate management.

Task 3: Assist, when feasible, tribal efforts in restoring salmonid populations to areas where stocks have been extirpated.

Objective 6: Communicate and coordinate effectively with other salmon producers and managers in the Columbia River Basin.

Task 1: Participate in U.S v. Oregon Production Advisory Committee (PAC) and Technical Advisory Committee (TAC) meetings when Leavenworth NFH Complex issues are being addressed.

Task 2: Develop technical reports for PAC and TAC, among others.

Task 3: Hold Hatchery Evaluation Team (HET) meetings each spring and fall to review progress, evaluate current programs, and propose changes as needed.

Objective 7: Conduct monitoring and evaluation to ensure Objectives 1 and 2 are achieved.

Task 1: Coded-wire-tag a representative portion of production fish.

Task 2: Bio-sample returning adults.

Task 3: Produce an annual report on stock assessment and contribution to fisheries.

Task 4: Compare survival, life history, fisheries contribution, and fish health parameters at Winthrop NFH to other State, Tribal, and National Fish Hatcheries producing spring Chinook in the Columbia River Basin.

Objective 8: Maximize survival at all life stages using disease control and prevention techniques. Prevent introduction, spread or amplification of fish pathogens.

Task 1: Routinely perform necropsies of clinically healthy and moribund fish to assess health status and detect problems before they progress to clinical disease or mortality.

Task 2: Implement disease preventative strategies in all aspects of fish culture to produce a quality fish. This includes prescribing the optimal needs and environmental conditions in the hatchery rearing container based on historical disease events.

Task 3: Follow USFWS Fish Health Policy and Implementation Guidelines (FW 713 1-5) on the

introduction of stocks into a facility which may result in the introduction of a new disease condition or mortality.

Task 4: Use sanitation procedures which prevent introduction of pathogens into and/or within a facility.

Task 5: Conduct applied research on new and existing disease prevention techniques.

Task 6: Utilize pond management strategies (e.g., Density Index, Water Exchange Rates, and Flow Index) to help optimize the quality of the aquatic environment and minimize fish stress which can induce infectious and non-infectious diseases.

Objective 9: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health.

Task 1: On a routine basis, monitor NPDES compliance of effluent hatchery water.

Task 2: On a routine basis, monitor influent hatchery water supply as it pertains to fish health guidelines.

Goal 2: Minimize impacts to ESA listed and other native species, their habitat, and the environment.

Objective 1: Minimize negative interactions with other fish populations by implementing state-of-the-art fish culture technology.

Task 1: Draft and implement actions identified in a Hatchery and Genetic Management Plan.

Task 2: Release juvenile fish (smolts) that are ready to migrate downstream.

Task 3: Mass mark all production fish to identify them from naturally produced fish.

Task 4: Support projects for restoration of ESA listed salmonids in the Methow River Basin, when funded.

Task 5: Upgrade hatchery intake and water delivery system to meet criteria described by NOAA Fisheries.

Task 6: Manage hatchery ladder within acceptable impacts to listed and native fish.

Task 7: Monitor interactions between hatchery and wild fish in the Methow River Basin (see Objective #2 below).

Objective 2: Conduct monitoring and evaluation to ensure goal #2 is achieved.

Task 1: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health.

Task 2: Assess straying (rates and where) of hatchery fish from Winthrop NFH.

Task 3: Monitor health and disease status of fish, following Service Fish Health Policy, attending Fish Health biologist, and IHOT guidelines.

Task 4: Support efforts to gain additional/sufficient information on hatchery/wild fish interactions and reproductive success of hatchery fish spawning in the natural environment.

Task 5: Develop a study plan to assess physiological status of juveniles prior to release (unfunded) and determine downstream migration rates (PIT tagging).

Objective 3: Assess the impacts of hatchery operations and facility structures on the Methow River.

Task 1: Assess and address, when feasible, impacts of hatchery structures as they affect fish passage to areas above the facility.

Task 2: Assess and address affects associated with the hatchery's water diversion and intake structure and its potential to negatively impact downriver habitat due to water withdrawal.

Goal 3: Provide the public with quality aquatic interpretation and education, customer service and comprehensive outreach to enhance public understanding, participation and support of Service and Winthrop NFH programs.

Objective 1: Increase visibility and credibility of Winthrop NFH.

Task 1: Coordinate with other federal, state, county and city governments with partnerships in natural resource education and information dissemination.

Task 2: Build and implement interagency cooperation with existing and new programs in the mid and upper Columbia River Basin.

Task 3: Coordinate with multiple partners including the U.S. Forest Service, Bureau of Reclamation, Tribes, schools and community businesses to host special events such as the annual Kid's Fishing Day during the National Fishing and Boating Week, Watershed Watchers, and more.

Task 4: Coordinate with regional and national Outreach Team members to develop consistent current messages on the Fisheries Strategic Vision, contemporary issues, and Fisheries Outreach activities.

Task 5: Increase and manage compatible public uses on hatchery land that link the community and the Service.

Task 6: Provide current Hatchery and Service project information to the media, elected officials, and all interested parties.

Task 7: Continue to build relationship with the *Friends of Northwest Hatcheries* (non-profit hatchery support group), nurturing relationships with board members and coordinating staffing and support for their projects and programs.

Objective 2: Provide information and education about Service programs and Winthrop NFH to internal and external audiences.

Task 1: Continue existing and develop new cooperative agreements and partnerships with public, private, non-profit organizations and schools.

Task 2: Maintain website, continue building media relations with local radio and newspapers, provide presentations to Service Clubs, special interest groups, regional and national conferences regarding agency issues and station activities.

Task 3: Provide quality customer service at the Hatchery for visitors seven days per week providing guided and self-guided tours, customized interpretive signing, environmental education, and continued updating of Visitor Center messages.

Objective 3: Continue to develop forums for public participation (or input) into Winthrop NFH issues and projects.

Task 1: Regularly participate in organizations and meetings supporting Methow River Basin watershed activities.

Task 2: Hold meetings throughout the year with local service clubs and conservation groups, partners, and the Methow River neighboring landowners to keep abreast of current hatchery issues and public concerns.

Task 3: Provide volunteer opportunities for public involvement with hatchery operations and educational programs.

Objective 4: Conduct monitoring and program evaluation to ensure all Outreach goals are met.

Task 1: Develop outreach evaluation tools in conjunction with Regional Outreach Team.

Task 2: Distribute teacher evaluations of key Outreach programs and activities to ensure that the public is receiving current and comprehensive meaningful experiences, education and information.

Objective 5: Share information regarding the history and historic character of the Winthrop NFH station.

Task 1: Continue interpretive programs that focus on the history of the hatchery, when and why it was constructed, and the types of fish reared.

Task 2: Continue maintaining the buildings and structures in a manner that meets the *Secretary of the Interior's Standards for the Treatment of Historic Properties* because they are an important tangible link to the history of the hatchery.

3.2 Current Practices to Achieve Goals, Objectives, and Tasks

Water Use and Management:

Winthrop NFH holds the following certificates of water rights:

Source	Certificate No.	Date	Flow/Amount	Use
Methow River	848	1/10/1922	50 cfs	Fish Propagation
Spring Branch Springs	206	11/15/1943	7239 acre-ft.(AF)	Fish Propagation

Gallery #1 (ground water)	7209A	4/6/1967	2420 AF	Fish Propagation
Gallery #2	7590A	2/17/1971	2420 AF	Fish Propagation
Gallery #3	03-07	10/1/2003	7240 AF	Fish Propagation

The main water source for the Winthrop NFH is the Methow River, from which the hatchery has the right to 50 cubic feet per second (cfs). Spring Branch Springs and a system of infiltration galleries provide a lesser amount of water (approximately 17 cfs combined water flow). The infiltration galleries are of great importance to the success of the hatchery because they provide a warmer flow essential for fish production during the cold winter months, and they also provide a relatively pathogen free water source, which is beneficial to egg incubation and early rearing.

Screening: All users of surface water in the Methow subbasin are required to have fish screening devices built in to protect threatened, endangered, and unlisted wild fishes. The hatchery owns and operates two such structures on the Foghorn Ditch. The Foghorn Irrigation screen is located just below the hatchery intake and has recently been reconstructed to meet strict requirements developed by NOAA Fisheries and the Washington Department of Ecology. The Winthrop NFH fish screen has also been recently reconstructed to meet these requirements. Both screens are rotary type drum screens which guide fish into a bypass channel which runs behind the hatchery and returns wild fish to the Methow River.

Conveyance System to Hatchery and Ponds: The screened surface water flows into a 36" pipeline which leads to the valve chamber where the water can be routed to any bank of ponds or to the hatchery building by gravity flow. The 3 infiltration galleries pump water to the valve chamber in steel pipelines ranging from 12 to 18 inches in diameter. The pressurized ground water provided by these pumps can be routed from the valve chamber to any bank of ponds or to the hatchery building. The pump sizes range from a 25 horsepower at gallery #1 to 75 horsepower at gallery #3. Gallery #2 has an additional line which leads directly to the adult holding pond. Gallery #1 has an additional line which can be routed directly to the A-bank Foster Lucas Ponds.

Effluent Treatment and Monitoring:

Raceway and nursery tank cleaning effluent is sent to a pollution abatement pond where solids are removed prior to discharge to the Methow River. Cleaning effluent and total discharge (normal operation) effluent are monitored weekly for suspended and settleable solids. Environmental Protection Agency standards have never been exceeded for either cleaning effluent or total discharge since monitoring began in 1981[?].

Brood Stock Management:

The following performance measures have been established at the hatchery.

Spring Chinook Salmon

Performance Measures	Hatchery Goal	5-Year Average	Range
Spawning population	400	431	386 - 499
Fish release (millions)	0.60	0.41	0.18 - 0.58
Egg transfers (thousands)	0	45.0	0 – 91.0
Fish transfers (thousands)	0	208.4	0 – 787.3
Adults passed upstream	N/A*		
Percent survival juvenile to adult	0.50	0.44	0.08 – 0.84

Smolt size at release (fish/lb)	18	17.5	13.7 – 20.5
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*Since the implementation of the Carson stock phase out and per co-manager agreements, all spring Chinook salmon (listed or not) which are not utilized for brood stock are allowed to spawn naturally upstream and downstream of the hatchery.

Coho Salmon

Performance Measures	Hatchery Goal	5-Year Average	Range
Spawning population	280	213	52 - 354
Fish release (millions)	0.25	0.25	0.19 - 0.31
Egg transfers (thousands)	0	0	0
Fish transfers (thousands)	0	61.1	0 – 160.6
Adults passed upstream	N/A*		
Percent survival juvenile to adult	0.50	0.15	0.05 – 0.27
Smolt size at release (fish/lb)	18	17.9	16.2 – 21.0

*Adult coho salmon in excess of broodstock needs are blocked from entering the facility and are allowed to spawn naturally in the Methow River system as part of the coho salmon restoration effort.

Steelhead Trout

As mentioned previously, steelhead are brought up to Winthrop NFH as eyed eggs from Wells Dam SFH. No adults are collected at the hatchery. The hatchery outfall channel has been enhanced for natural spawning adult steelhead which return to Winthrop NFH. Spawning surveys and redd counts are conducted each spring on the channel as part of the WDFW annual steelhead spawning surveys. **Survival estimates.....Jateff.**

In 1999, Winthrop NFH began to phase out the Carson stock spring Chinook salmon, which were reared and released from WNFH since 1976. The Carson stock has been gradually replaced with a localized stock, Methow Composite, developed by the Methow SFH located about 1 mile upstream of Winthrop NFH. The Methow Composite stock was created from a mixture of fish returning to the Methow and Chewuch Rivers. During years of extremely depressed adult returns, hatchery fish returning to WNFH were also included in the brood stock used to build the Methow Composite stock. The goal has been to continually decrease the percentage of Carson stock within the Methow Composite stock by crossing returning adult females with males carrying a lower percentage Carson ancestry or with wild males.

Brood stock collection at the hatchery is managed to maintain the genetic integrity of the stock. The Service management goals are to ensure that adult brood stock is randomly collected for spawning across the run in proportion to the rate at which they return. Early in the phase out, collection plans included racking off the hatchery discharge channel to block returning Carson stock to the facility and collecting localized, Methow Composite, stock from the outfall channel at the Methow SFH. Only since 2003, has the hatchery been able to return to operating its fish ladder and collect fish returning to the hatchery as the pure Carson stock were no longer in the river system.

Adult spring Chinook return to the hatchery from May through July. During years where large adult returns are

expected, a weir is installed in the lower section of the outfall channel and opened and closed periodically. This strategy allows the facility to collect fish from throughout the run, encourages excess listed fish to leave the shallow channel and seek out natural spawning locations in the Methow River system, and reduces the number of excess fish handled by hatchery personnel.

The first spawning date for the spring chinook is usually mid-August and most spawning is normally completed by the first week of September. The holding pond is supplied with ground water from gallery #2 which maintains a constant temperature between 48° - 50° F. The volume of the pond is such that density is not a concern. However, pond water flow is managed to meet or exceed one gallon of inflow per fish. The adults are injected with erythromycin 30 days and again at 14 days prior to spawning to control bacterial kidney disease. Adults are generally treated three days per week with formalin to control external parasites.

Eggs are taken each Wednesday to allow time between egg takes for fish to develop viable eggs and to coordinate sampling by the Olympia Fish Health Center. The day of spawning, all ripe females are separated with an equal number of males, if sex ratio and stock availability allow. Ripe females are bled prior to spawning. Due to the variety of stocks present, all fish must be identified by CWT reading prior to mixing gametes. Therefore all gametes are bagged, numbered, and placed in large coolers for later identification and fertilization.

Coho salmon adults return to the hatchery from early October through November. Fish are also trapped at Wells Dam by WDFW and Yakama Nation personnel and transported to Winthrop NFH beginning in late September. Spawning usually begins in mid-October and continues each Wednesday for approximately 5 weeks. All coho are considered to be lower Columbia stock and gametes are mixed at the adult pond then moved inside the hatchery building for incubation.

Surplus Adult Returns:

Surplus adult spring Chinook and coho salmon are not allowed to enter the facility and are allowed to spawn naturally in the Methow River system. This scenario is part of the recovery plan for the listed spring Chinook salmon and part of the YN restoration feasibility study for coho salmon. Spawned male spring chinook only can be used for stream enrichment, as the females are injected with erythromycin and thus cannot be used for this purpose. Coho salmon are not injected, so both sexes can be used for stream enrichment. Erythromycin has not been cleared for use on food fish by the Federal Drug Administration; therefore, carcasses previously injected with erythromycin cannot be used for human consumption and must be buried on site. In accordance with the Pacific Northwest Fish Health Protection Committee draft Salmon and Steelhead Carcass Distribution Protocols pre-spawn mortalities cannot be used for stream enrichment and must be buried on site as well.

Spawning Protocol:

Fish are randomly selected and mated as close to a 1:1 male/female ratio as possible. Typically, the sex ratio for the returning spring Chinook adults is skewed 60/40 in favor of the females. Because of the large number of fish spawned and the genetic hierarchy created for each brood year, males may be used twice to further reduce non-local genes in Methow Composite spring chinook. Jacks (age-3 males) are randomly included in the spawning population. Should a large number of jacks return, the number will be limited to 5% of the total number of males used (per Regional genetics guidelines) unless the genetics of the 3 year old males takes priority over other year classes.

The number of adults retained (capacity) for brood stock is based on density and flow indices, which relate to the amount of available water and space for juvenile rearing.

Other Acceptable Stocks:

If brood stock numbers are insufficient to meet hatchery production objectives, the hatchery will rear fewer fish. In case of a natural or man-made disaster, spring Chinook stock may be obtained from Methow SFH. Coho salmon are considered to be lower Columbia River stock and can also be obtained from the Wenatchee River stock or Willard NFH.

Upstream Passage:

No barriers prevent fish from passing upstream of the hatchery. Hatchery fish volitionally enter the hatchery, homing to the hatchery outfall channel which enters the Methow River directly across from the town of Winthrop. Any non-target species entering the adult holding pond, such as bull trout and sockeye (less than 1 per year), are returned to the river unharmed.

3.4 Incubation Strategies and Procedures

Spring Chinook Salmon - Eggs from each female are individually incubated until the eyed stage at which time dead eggs are removed. Viable eggs are counted and moved into Marisource (Heath) trays for hatching and larval development. All incubation takes place in 48°-50° F ground water. Fry from females with high levels of Bacterial Kidney Disease are released unfed to the back channel unless needed to meet production goals. The first take of eggs hatch in mid-October.

Coho Salmon – Eggs from two females are incubated together in each Heath tray. At the eyed stage, dead eggs are removed. Viable eggs are counted and placed back into Heath trays for hatching and larval development. Eggs are incubated on 100% ground water until hatching, at which time river water(36°-42°) is introduced to slow the development process. The first take of eggs hatch in min-November.

Steelhead – Eggs are received from Wells SFH in February and are placed in Heath trays at approximately 5000 eggs per tray. All incubation takes place in 48°-50° F ground water. The first take of eggs hatch in mid-March.

3.5 Rearing Strategies

Spring Chinook Salmon - Fry are moved to inside nursery tanks and outside Foster-Lucas ponds for their initial feeding. Fry are fed BioOregon's starter feed and BioMoist feeds throughout rearing.

During late January, all spring Chinook fry are moved outside to occupy 8 Foster-Lucas ponds and remain there until after the previous broodyear is released and other raceways are cleaned and disinfected. The fish marking staff from Columbia River Fishery Program Office (CRFPO) tags, inventories and moves all fish in May. May is the optimal time to mark fish at this facility for two reasons: 1) The fingerlings are about 100 fish/pound, a good size for marking and handling; 2) fingerlings are near their maximum pond density and need to be moved.

Coho Salmon – Fry are moved to inside nursery tanks in February for their initial feeding. Feed type remains the same as for spring Chinook fry. Coho are generally marked immediately following the spring Chinook in May at which time they are moved to their final rearing ponds.

Steelhead – Fry are moved to inside shallow troughs in April. After all fry have started feeding and growing readily, they are moved to the inside nursery tanks (within 3 weeks). Fry are fed BioOregon's starter feed and BioMoist feeds throughout rearing. Steelhead are marked in July or August and moved outside to the Foster-Lucas ponds where they can be isolated on ground water for steady growth through November. When the fish are greater than 15 fish per pound, usually early December, they are moved to 4 – 12' x 100' raceways, their final rearing location.

Beginning with brood year 2000, rearing space has been managed so that density indices (the ratio of weight of fish to rearing unit volume and fish length) at no time exceed 0.11 for spring Chinook salmon and 0.20 for steelhead and coho salmon. Reduced production numbers and reduced densities appear to have led to a decline in a number of disease problems.

3.6 Release Strategies

Spring Chinook Salmon - Smolts are mass released directly into the outfall channel (leading to the Methow River) at a size of 16 to 18 fish per pound to minimize interactions with other fish populations. Releasing fish at 18 fish/pound or larger helps ensure that the released fish are functional smolts which actively migrate through the Methow River corridor.

Smolts are released around the third week of April to coincide with normal spring migration and spill at Columbia River dams. It is likely that the fish are functional or near functional smolts at this time as evidence by their rapid migration to the Rock Island smolt trap (personal communications with Chelan PUD fish biologists). Detection of PIT tagged fish at McNary and Bonneville Dam's bypass facilities provides evidence of rapid movement of smolts released from Winthrop NFH. The average travel time from release to McNary Dam, for release years 1993 – 2005, is 28.4 days with a minimum travel time of 23 days in 2003 to a maximum time of 36 days in 2001. McNary Dam is approximately 276 miles from Winthrop NFH. The average survival from release to McNary Dam is 49% with a minimum survival of 43% in 2001 to a high of 56% in 1999 (SURPH database, 2004).

Coho Salmon – Smolts are volitionally released directly into the outfall channel at a size of 16 to 18 fish per pound to minimize interactions with other fish populations. Releasing fish at 18 fish/pound or larger helps ensure that the released fish are functional smolts which actively migrate through the Methow River corridor. The volitional release period begins in mid-April and remaining fish are forced out at the end of the month. Detection of PIT tagged fish at McNary and Bonneville Dam's bypass facilities provides evidence of rapid movement of smolts released from Winthrop NFH. The average travel time from release to McNary Dam, for release years 2000 – 2004, is 51 days with a minimum travel time of 29 days to a maximum time of 115 days. The average survival from release to McNary Dam is 25% with a minimum survival of 9% in 2001 to a high of 34% in 2000 (YN, personal communication, 2006).

Steelhead - Smolts are volitionally released directly into the outfall channel at a size of 6 to 8 fish per pound to minimize interactions with other fish populations. Releasing fish at 8 fish/pound or larger helps ensure that the released fish are functional smolts which actively migrate through the Methow River corridor. The volitional release period begins in mid-April and remaining fish are forced out at the end of the month. Detection of PIT tagged fish at McNary and Bonneville Dam's bypass facilities provides evidence of rapid movement of smolts released from Winthrop NFH. The average travel time from release to McNary Dam, for release years 2003 – 2005, is 26 days with a minimum travel time of 12 days to a maximum time of 34 days, however a small percentage of steelhead are seen migrating downstream approximately one year later, the following spring. These juvenile steelhead are apparently residing in the river system an additional year before being physiologically ready to migrate to sea. Since these fish are a listed stock and the percentage is less than 1%, it is likely there is very minimal competition with wild fish in the river system. The average survival from release to McNary Dam is ___% with a minimum survival of ___% in ___ to a high of ___% in ___ (SURPH database, 2004).

3.7 Fish Health Management Program

The primary objective of fish health management programs at Service hatcheries is to produce healthy smolts that will contribute to the program goals of that particular stock. Equally important is to prevent the introduction, amplification or spread of certain fish pathogens which might negatively affect the health of both hatchery and naturally producing stocks.

Fish Health Policy:

The Olympia Fish Health Center (FHC) in Olympia, WA provides fish health care for Winthrop NFH under the auspices of the published policy 713 FW in the Fish and Wildlife Service Manual (FWM). In addition to this policy, the 1994 annual report "Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries", by the Integrated Hatchery Operations Team (IHOT 1995) provide further fish health guidelines as approved by northwestern state, federal, and tribal entities. The directives of these two documents more than meet the requirements of Washington's state and tribal fish health entities which follow the directives in the 1998 Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State.

The documents mentioned above provide guidance for preventing or minimizing diseases within and outside of the hatchery. In general, movements of live fish into or out of the hatchery must be approved in the U.S. v Oregon Production Advisory Committee forum and be noted on the State of Washington Brood Document for the hatchery. If a fish transfer or release is not on the Brood Document, permits from the Washington Department of Fish and Wildlife, the Service, and any other states through which the fish travel must be obtained and approved by co-managers. Fish health exams and certifications must be completed prior to any releases or transfers from the hatchery to minimize the risk of disease transmittance to other populations.

Fish Health Examinations:

Routine examination: A pathologist from the FHC visits approximately once per month to examine juvenile fish at the hatchery. From each stock and brood year of juveniles, fish are sampled to ascertain general health. Based on pathological signs, age of fish, concerns of hatchery personnel, and the history of the facility, the examining pathologist determines the appropriate tests. This usually includes a necropsy which includes microscopic examinations of the skin, gills, and internal organs. Kidneys (and other tissues, if necessary) will be checked for the common bacterial pathogens by culture and/or other tests specific for the particular pathogen of interest. Blood may be examined for signs of infection and cellular or biochemical abnormalities. Additional tests for virus or parasites are done if warranted. The pathologist may also examine fish which are moribund or freshly dead to ascertain potential disease problems in the stocks.

Diagnostic Examination: This is done on an as-needed basis as determined by the pathologist or requested by hatchery personnel. Moribund, freshly dead fish or fish with unusual signs or behavior are examined for disease using necropsy and appropriate diagnostic tests.

Pre-release Examination: Hatchery staff must notify OFHC at least six weeks prior to a release or transfer from the hatchery, when 60 fish from the stock of concern are sampled and tissues taken for testing of the required pathogens. The pathogens, defined in Service policy 713 FW (Fish and Wildlife Service Manual) for salmonids include infectious hematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), viral hemorrhagic septicemia virus (VHSV), *R. salmoninarum*, *Aeromonas salmonicida*, *Yersinia ruckeri*, and under certain circumstances other pathogens such as *Myxobolus cerebralis* and *Ceratomyxa shasta*.

Adult Certification Examination: At spawning, tissues from adult fish are collected to ascertain viral, bacterial, and parasite infections and to provide a brood health profile for the progeny. The FHC tests for the pathogens listed above and others as required for each stock and program. The minimum number of samples collected is defined by 713 FW. At Winthrop NFH, all brood females are tested for *R. salmoninarum* (causative agent of BKD), with an identifying fish health number corresponding to each female's eggs so that selective culling and/or segregation is possible. This is done to reduce and control BKD, a vertically-transmitted disease. Progeny from females with high levels of BKD are culled and if progeny from moderate risk fish must be kept,

they are segregated from progeny at lower risk and reared at lower densities to further reduce the risk of their developing clinical BKD and spreading it to the low risk group. The FHC provides results from testing as soon as possible for evaluation of management options.

Chemotherapeutant Use:

Administration of therapeutic drugs and chemicals to fish and eggs reared at Winthrop NFH is performed only when necessary to effectively prevent, control, or treat disease conditions. All treatments will be administered in compliance with FDA and EPA regulations and agreements for the use of aquatic animal drugs and chemicals. (See also Chapter 4 “Drugs and Anesthetics”, “National Pollution Discharge Elimination System”, and “Investigational New Animal Drugs”)

Erythromycin injections for spring Chinook salmon female brood stock are critical to the control of bacterial kidney disease which is caused by a vertically transmitted bacterium (*R. salmoninarum*). In addition, erythromycin treatment helps control mortality and reduces horizontal transmission of *R. salmoninarum* among adults in the brood pond. Prior to the administration of erythromycin, surplus adults may be outplanted to nearby streams and made available to appropriate groups. Except for fish arriving too close to the time of spawning for safe handling, all spring Chinook salmon females kept for broodstock at Winthrop NFH will be injected with erythromycin twice, generally in late-June and again in late July. Since there is no INAD exemption permit or New Animal Drug Approval for this use, an extralabel veterinary prescription is written by a VMO at OFHC and injected carcasses are not used for stream nutritional enhancement or human or animal food.

Formalin treatment of adults held for brood stock are used a minimum of three times per week to control external pathogens during the holding period prior to spawning. More frequent use may be recommended by OFHC staff as conditions warrant.

Salmonid egg hardening and disinfection treatment with a polyvinylpyrrolidone iodine compound (approximately 1% iodine) is required by 713 FW policy to minimize/prevent transmittance of viral and bacterial pathogens. The eggs shall be disinfected in 50 ppm iodine in water for 30 minutes during the water-hardening process. Eggs received at the hatchery must be disinfected before they are allowed to come in contact with the station’s water, rearing units or equipment. Specifics are provided in 713 FW policy.

Other Fish Health Precautions:

Eggs from female brood stock with high levels of BKD (a cut-off point selected by OFHC based on results from the Enzyme-Linked Immunosorbent Assay or ELISA) will not be used in production. If the number of brood females is low, progeny from moderately infected females may be segregated into rearing units apart from the rest of the production, reared at reduced densities as outlined in the USFWS/WDFW Fish Health Guidance letter of May 1, 2002 “Recommendations for Chinook fish health management in the mid and upper Columbia River” (Attachment 12) and strict disinfection and hygiene procedures implemented for equipment and rearing units associated with maintaining fish with this elevated level of risk on station.

With the exception of the above listed treatments, drugs and chemicals for treating eggs and fish are used on an “as needed” basis. Formalin treatments for adult brood stock are given to control external parasites and as a fungicide on eggs. Minimizing chemical and drug use will not only reduce impacts on the local environment but will help maintain compliance with the various safety regulatory agencies, as well as reduce risks to employees.

Tank trucks and tagging trailers are disinfected before being brought onto the station and after use at the hatchery.

Abernathy Fish Technology Center provides routine quarterly proximate analysis on the feed to ensure that it meets the feed manufacturer's specifications. If nutritional concerns arise, Hatchery or Fish Health Center staff may consult with the Abernathy Fish Nutritionist who may then perform or coordinate testing for specific levels or quality of ingredients in the feed.

3.8 Monitoring, Evaluation, and Coordination

The Mid-Columbia River Fishery Resource Office (MCRFRO) provides monitoring, evaluation, and coordination services concerning Winthrop NFH production. MCRFRO staff monitors hatchery returns, biological characteristics of the hatchery stock, fish marking, tag recovery, and other aspects of the hatchery program, and they maintain the database that stores this information. MCRFRO also cooperates with the hatchery, fish health and technology centers, and co-managers to evaluate fish culture practices, assess impacts to native species, and coordinate hatchery programs both locally and regionally.

Database Management:

The Fisheries Information System (FIS) is a national database system for the Service's Fisheries Program. Each Service field office contributes to this database. The FIS consists of five different databases, two of which (Fish and Egg Distribution databases) document production accomplishments from all National Fish Hatcheries.

Information from and about Winthrop NFH is connected to the broader fisheries community of the West Coast of the North American Continent through the U.S. Fish & Wildlife Service Columbia River (information) System (CRiS). The following information is recorded in files that are components of the CRiS database: adult, jack and mini-jack returns to the hatchery; age, sex, length, mark and coded-wire tag information for returning fish that are sampled; egg development and disposition; the origin of fish raised at the hatchery; and fish transfers and releases. Winthrop NFH maintains files containing information generated at the hatchery (brood stock management, incubation, rearing, and release). MCRFRO staff maintains files containing information on marked juvenile fish and on sampled adult fish (adult bio-samples).

Use of CRiS database files and programs achieves the following multiple purposes: 1) reduces the amount of effort expended to meet reporting requirements, 2) increases the quality and consistency of data, 3) facilitates development of software usable at all stations, 4) provides a platform on which to build effective evaluation tools which can be used by hatcheries, fisheries management and regional offices, and 5) facilitates the exchange of information with other agencies. For example, release and recovery information is reported to both the Regional Mark Information Center and the StreamNet databases.

Computer programs that are components of the CRiS database are used to transform data into formats required by other agencies. These formats can be either electronic or printed. Other CRiS programs combine data from the hatchery, MCRFRO, and from databases maintained by other agencies into other formats to accomplish reporting, monitoring, and evaluation.

Marking/Tagging Program:

Juvenile fish are fin clipped, coded-wire tagged, and/or PIT tagged at Winthrop NFH by the Columbia River Fisheries Program Office (CRFPO). The marking program is funded and directed by MCRFRO. This program is designed to monitor and evaluate fish culture techniques, survival and fishery contribution. Presently, spring Chinook salmon are 100% adipose fin-clipped and 50% carry a CWT at Winthrop NFH to identify hatchery fish in selective fisheries and to measure the impacts on wild anadromous and resident stocks of fish in the upper-Columbia Region.

Bio-sampling and Reporting:

State and tribal coast-wide sampling of sport, tribal, and commercial fisheries, and hatchery rack return sampling by MCRFRO and the hatchery staff, provides near total recovery and survival estimates for each brood year released.

Coded-wire tag recovery information is used to evaluate the relative success of individual brood stocks and compare performance between years and hatcheries. This information is used by salmon harvest managers to develop plans to allow the harvest of excess hatchery fish while protecting threatened, endangered, or other stocks of concern.

Current bio-sampling efforts by MCRFRO involves removing snouts from all CWT present adults. In the past, all adults with missing adipose fins were considered to carry a CWT. The current marking program is 100% CWT for all spring Chinook and coho salmon. Only non-listed spring Chinook, which normally comprise less than half of the SCS production, require an adipose clip. Coho salmon are not clipped as part of the reintroduction strategy while steelhead are 100% adipose clipped to be included in sport fishing openers, numbers permitting. Snouts will be removed and the CWT extracted and de-coded for all returning adults with the tag. Current sampling efforts are geared to sample 100% of the returning adults.

Hatchery Evaluation Studies:

Hatchery evaluation is the use of replicable, statistically defensible studies to guide management decisions. The hatchery evaluation vision action plan developed in 1993 for Region 1 Fisheries, describes hatchery evaluation in greater detail (USFWS 1993). The purpose of hatchery evaluation is to simply determine what works and doesn't work through planning, implementing, documenting, monitoring, analyzing, and reporting.

We continually evaluate adult returns, sex ratios, fish sizes, brood returns, straying, smolt to adult survival and other parameters important to evaluating a hatchery program.

Additional studies at Winthrop NFH have included: 1) a "hands off" study which evaluated the effects of using automatic feeders and partially covered raceways, as opposed to hand feeding with no covers; 2) a "NATURES" type rearing study including in-pond structure, cover and automatic feeders, as opposed to hand feeding with no cover or structure; 3) fish groups with different ELISA values were evaluated to examine differences in rearing survival; 4) different types of cover and bird exclusion devices were evaluated; 5) evaluated the survival and physiological differences of steelhead which are voluntarily released versus force released (Abernathy FTC); 6) evaluated the use of dry versus moist feed on steelhead. Information gained from some of these efforts has been incorporated into the production program.

Stock Assessment and Contribution to Fisheries: Substantial routine coded-wire tagging (CWT) of production fish under Bureau of Reclamation funding began with brood year 1986 and has progressed to a 100% marking rate since brood year 1994. All marked fish and release information is reported by MCRFRO to the Pacific States Marine Fisheries Commission (PSMFC). Mark and tag information from sampled fish, recovered in various fisheries, hatcheries, and spawning grounds, are also reported.

The Fish Passage Center (FPC, part of the Northwest Power Planning Council) has routinely applied Passive Integrated Transponder (PIT) tags to production releases beginning with brood year 1991 and continuing to present day. From brood years 1991-1995 approximately 1,000 fish were tagged annually to document survival and travel time through the Columbia River hydro-system. Marking was increased to approximately 7,500 fish annually from brood years 1996-1999. Beginning with brood year 2000 and continuing to brood year 2002, production releases have been intensively tagged at a rate of approximately 20,000 fish annually as part of a McNary Dam transportation study conducted by the Army Corp of Engineers (ACOE). Data collected from subsequent interrogation of PIT tags at various locations throughout the Columbia Basin is analyzed through FPC's smolt monitoring program (SMP) and by ACOE.

As assessed by the MCRFRO, the average survival for completed CWT brood years 1979 – 2000 is 0.16% with a standard deviation of 0.24% (spring Chinook salmon). The minimum survival was .002% for brood year 1990 and maximum survival was 0.84% for brood year 1997. Preliminary information indicates that recent brood year returns (1995-2000) have increased substantially with an average survival of 0.47% with a within basin return of 0.41% (Attachment 13). CWT information provides contribution estimates to various marine and freshwater fisheries in addition to recoveries at hatcheries or spawning grounds throughout the Columbia Basin. Data compiled by MCRFRO indicates, for return years 1999 – 2005, that approximately 20% of Winthrop NFH spring Chinook were recovered at the hatchery, 11% were recovered at Methow and Wells state fish hatcheries, 0.4% were harvested in treaty/ceremonial fisheries, 6.5% were captured in freshwater/Columbia River sport fisheries, 55% were recovered on Methow Basin spawning grounds, and 6% were harvested in lower Columbia River gillnet fisheries (Attachment 14). Less than 1% was estimated to have been harvested in marine fisheries.

Juvenile Monitoring:

Juvenile fish at Winthrop NFH are monitored on a routine basis by the hatchery staff to determine the condition factor of fry, fingerling and yearling fish. Samples are taken monthly for Bio-analysis by Olympia Fish Health Center to determine the health condition of fry, fingerlings, yearling and smolts prior to release.

ESA Assessments, Ecological Interactions, and Natural Production Studies:

The Service completes Biological Assessments (BA) and Hatchery and Genetic Management Plans (HGMP) to comply with the ESA. These assessments and plans help guide facility operation and production, considering the potential impacts on the biological community.

To comply with the ESA, the Service initiated a BA back in 1993, which described potential impacts to listed Snake River stocks. Since the original BA, more than a dozen additional assessments have been submitted to both NOAA Fisheries and the Service covering the Winthrop program. Although these BA's were sufficient in detail to satisfy legal requirements, in 1999 a new process was formulated by NOAA Fisheries and the Service which required the drafting of HGMP's. This document, submitted in November 2002 and considered a "phase I draft", describes current operations at the hatchery and will comply with ESA obligations, covering both NOAA Fisheries and Service trust species. The phase I draft was distributed to the co-managers and other interested parties which then served as the focus for the collaborative, phase II part of the process. Collaboration meetings began in early 2003 and were essentially completed in late 2003. The phase II draft plan was provided for the subbasin planning process and the appropriate technical recovery team (TRT) for consideration and interaction with these groups. The phase II draft plans will be set-aside (parked) until all HGMP's relevant to an Evolutionarily Significant Unit (ESU) are completed, allowing for ESU-wide considerations and feedback with the TRT/Recovery Planning process. The HGMP collaborators will incorporate TRT advice as appropriate to ensure consistency with broader recovery objectives. This step culminates in Phase III drafts, which become final and ready to implement after approval by NOAA Fisheries and the Service.

As previously mentioned, of special concern in the Methow River Basin is wild (listed) steelhead, spring Chinook, and bull trout production. Natural production of juvenile, smolt and adult steelhead and spring Chinook is currently monitored by WDFW and Douglas Public Utility District (PUD). The Olympia FHC is also assessing the status of wild fish health in the Methow watershed.

Additional monitoring needs have also been identified in the Draft Methow Subbasin Summary. This document is available at the hatchery's administration office.

Environmental Monitoring:

Environmental monitoring is conducted at Service facilities to ensure these facilities meet the requirements of the National Pollution Discharge Elimination System 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). The following parameters are currently monitored at this hatchery.

- Total Suspended Solids (TSS): 1 time per week on composite effluent, maximum effluent and inflow samples. Once per month on pollution abatement pond and effluent samples.
- Settleable Solids (SS): 1 time per week on inflow and outflow samples. Once per week on pollution abatement pond effluent samples.
- In-hatchery water temperatures: minimum and maximum daily.
- In-hatchery Dissolved Oxygen: as required by stream flow or weather conditions.

Coordination/Communication:

The hatchery holds HET meetings each spring and fall. These meetings include representatives from Winthrop NFH, MCRFRO, and OFHC. Topics of concern include reports on current activities and accomplishments, present management programs, and future plans or studies that might effect, or be affected by hatchery operations. Other aspects include survival, life history, fisheries contribution, and fish health parameters at Winthrop NFH and how it compares to other National Fish Hatcheries producing salmon and steelhead in the Columbia River Basin.

In the past, HET meetings were attended by Service staff only. In the future, the co-managers and other cooperators may be invited to the meetings, particularly if the issues to be discussed may have an affect on other programs.

Fish and Egg Transfers:

All fish and egg requests and transfers are coordinated through Winthrop NFH, MCRFRO, WDFW, OFHC, and CRFPO. Any request for fish and/or eggs, either in or out of Winthrop NFH, will be in writing and a National Fish Hatchery Planned Release or Transfer Schedule will be prepared by the requester. All transfers of fish and/or eggs require a fish health certification from Olympia Fish Health Center. All fish and egg transfers are made in accordance with co-managers fish disease control policy and the Service's fish health policy and implementation guidelines. If the fish and/or eggs are determined to be healthy, the MCRFRO arranges for all appropriate state permits involving the transport. The transfer schedule is signed by the Winthrop NFH manager and OFHC, which sends the document and permits to the CRFPO for approval. These requests and permits are kept at the hatchery and MCRFRO for future reference.

Interagency Coordination/Communication:

As part of the U.S. v Oregon Columbia River Management Plan, the Technical Advisory and Production Advisory Committees are comprised of harvest and production assessment biologists, including representatives from the Service, Tribes, NOAA Fisheries, and states of Oregon, Washington and Idaho. These groups provide management direction used in establishing hatchery fish production goals and harvest rates. MCRFRO participates, as needed, to assist Service personnel participation in these coordination forums.

The Integrated Hatchery Operations Team (IHOT) was comprised of representatives from fish management agencies, including the Service and tribes. IHOT developed a series of regional hatchery policies and

operational plans. The IHOT group has since been replaced by the Artificial Production Review process funded by the Northwest Power Planning Council. The Service is represented by our Regional Office staff.

Pacific Northwest Fish Health Protection Committee (PNFHPC) is comprised of representatives from U.S. and Canadian fish management agencies, including OFHC, tribes, universities, and private fish operations. The group meets twice a year to monitor regional fish health policies and to discuss current fish health issues in the Pacific Northwest.

Annually, each October, the Leavenworth NFH Complex sponsors a Hatchery Management Workshop in the Tri-Cities area of Washington State. While this workshop focuses primarily on FWS hatcheries in the Columbia Basin, other entities (including tribes) frequently attend and give presentations/participate in discussions.

On an annual basis, usually in February, the Service hosts a coordination meeting with the Yakama Tribe in Yakama, Washington. Information presented covers FWS hatchery programs and updates are presented by the tribe concerning their programs. This coordination meeting has been praised by the YN as a great means to communicate and share information.

Ocean Fisheries Management:

Winthrop NFH spring Chinook salmon are not recovered in ocean fisheries in significant numbers and do not influence ocean fishery management decisions.

Freshwater Fisheries Management:

Washington, Oregon, and the four treaty tribes (Yakama, Warm Springs, Umatilla and Nez Perce), that are parties to the Columbia River Fish Management Plan (US v Oregon), prepare harvest strategies based on run size predictions made by their respective fishery agencies. They then jointly present their findings to the Columbia River Compact through the Technical Advisory Committee (TAC). The Columbia River Compact, created by congress, has the authority to approve or reject sport and commercial fishery proposals for the mainstem Columbia River. In their deliberations, the Compact will consider the findings of the TAC. If those findings are in compliance with the management plan, brood stock goals and ESA guidelines, and the run size prediction shows a harvestable surplus, the Compact will set seasons for non-tribal and/or tribal fisheries in the mainstem Columbia River.

If a harvestable surplus is predicted for Icicle Creek, the State of Washington and Yakama Nation will set regulations for terminal area non-tribal sport and/or tribal subsistence fisheries. Fishing regulations are established to also provide adequate escapement for hatchery production and meet ESA guidelines.

3.9 Public Outreach Activities

The Leavenworth National Fish Hatchery Complex houses one of the most comprehensive Information and Education Outreach Departments (I&E) in the National Fish Hatchery System. Serving Leavenworth, Entiat and Winthrop National Fish Hatcheries, this department is managed by an Outreach/Public Affairs Supervisor and staffed with an Environmental Education Specialist, Interpretive Specialist/Friends Group liaison and Information Receptionist. The I&E department shares and distributes its time and staffing between the three stations and serves many partners in both the private sector, schools, tribes and multiple local, city, state and federal government agencies. Funding for the I&E program comes from the Complex budget and is supplemented by financial support from fundraisers, local community contributors, sponsors, and grants raised and managed by the Friends of Northwest Hatcheries.

The goal of the Leavenworth Complex I&E Office outreach program is to increase the visibility of Fish and

Wildlife Service hatcheries in eastern Washington State and to provide information about FWS programs to both internal and external audiences. FWS staff and volunteers show how FWS programs benefit the public and the environment in keeping with the FWS mission, "to conserve, protect, and enhance the Nation's fish and wildlife and their habitats for the continuing benefit of people."

Recognizing that it is increasingly important for all FWS staff to be involved in gaining or retaining public support for agency programs, the I&E program strives to insure that staff is well-informed about policies, procedures, and issues; and that staff are willing and able to interact with our various publics. Program directives include providing current information and natural resource education to staff, partners, stakeholders, school teachers, students and volunteers. Outreach to community members and a diverse public is critical. The program focus is to use current communication techniques and interactive inter-disciplinary outdoor education as a management tool to support the health and survival of our hatcheries and the Service as a leader in natural resource conservation.

An estimated 3,000 guests visit Winthrop NFH annually. These visitors come from all walks of life, diverse backgrounds and ages and are documented from hatchery tour records, tour bus companies, guest book registrations, special events and walk-ins. Our visiting public has become much more educated about natural resources. Many visitors and tour groups want an in-depth visit to the hatcheries in our Complex. The challenge faced by the I&E Department is to maintain quality interpretive and educational messages that stimulate thinking and conversation on all aspects of salmon issues. Hatchery tours are custom-made per group and include natural resource interactive games, interpretive trail walks, fish viewing, hands-on projects and more.

On Station: I&E activities held on station include guided and self-guided tours. The facility serves schools from throughout north central Washington, primarily from the Methow Valley. Many tours are conducted for adult groups including Elderhostel, tour bus companies, community school and several special interest groups. Hundreds of individuals and families, business groups and hotel/motel visitors enjoy the self-guided approach that the hatchery offers by way of a brochure and on-the-ground signing. Primarily, these audiences are seeking answers to questions concerning water use, history of Winthrop NFH, hatchery operations, Native American fishing, and other contemporary salmon issues.

The Winthrop NFH Kid's Fishing Day is the largest special event which Winthrop NFH hosts annually during National Fishing Week (a Saturday in June). This multi-partnered event also includes environmental education activities.

Another significant event held at Winthrop NFH is the Watershed Watchers event developed for the local 7th grade science classes. This is also a one-day event which involves a number of watershed related educational activities for the students.

Off station: Outreach efforts include an array of activities that occur throughout north central Washington State. The Outreach program provides counsel and fills requests for environmental education curriculum, interpretive materials and partnership building for all hatcheries in the region. The Winthrop NFH staff travels to other special festivals and events throughout eastern Washington assisting the Leavenworth National Fish Hatchery, the Wenatchee and Okanogan National Forests, Chelan County Conservation District and Chelan PUD.

Partnerships/Cooperators with Winthrop National Fish Hatchery:

- U.S. Forest Service- Okanogan National Forest
- Friends of Northwest Hatcheries

- USDA – Natural Resource Conservation Service
- Okanogan County Conservation District
- Douglas County PUD
- Bureau of Reclamation
- Army Corps of Engineers
- Methow Valley School District
- Colville Confederated Tribes
- Yakama Indian Nation
- Methow Valley Fly Fishers
- Washington State Department of Fish & Wildlife
- Bonneville Power Administration
- City of Winthrop
- The Methow Conservancy
- Methow Natives Nursery
- Methow Arts Alliance
- Foghorn Ditch Company(Irrigation District)
- Congressman Cathy McMorris and staff representatives
- Media partners include the Methow Valley News, Wenatchee World, KOZI and KVLK Radio
- Okanogan County Sheriff's Department
- Okanogan County Fire Department

These agencies, organizations, schools and businesses provide invaluable support for special event and education program planning and implementation. Partnerships are imperative and are integrated into every outreach project, activity or program held.

3.10 Special Concerns

Planning Issues:

Several federal, state and tribal entities share responsibilities for development of subbasin/watershed plans, hatchery production, harvest management, and ESA considerations. Recent actions have centered on identifying and correcting factors contributing to the decline of the Methow River basin's aquatic resources. The agencies involved include the U.S. Forest Service, U.S. Fish and Wildlife Service, NOAA Fisheries, Geological Survey, Bonneville Power Administration, the Washington Department of Fish and Wildlife, and the Yakama Nation. Private land owners, the public, and watershed groups play an important role in managing the Methow River watershed.

These plans will recognize and comply with all management plans and Biological Opinions affecting the Columbia River Basin in general and the Methow Basin. Operations at Winthrop NFH contribute to a number of potential issues in the watershed. The primary issues center around marking, water use, juvenile distribution and production numbers, surplus adult distribution, impacts to listed and other aquatic resources, and actions being taken to help recover listed and depressed populations. Implementation of these plans has the potential to alter Winthrop NFH production programs and operations.

Marking:

To help protect wild and naturally produced fish, the states of Washington, Oregon and Idaho are implementing selective sport and commercial fisheries (non-tribal) on marked hatchery fish. This selective fisheries management strategy requires that all hatchery produced fish targeted for harvest be mass marked. Mass marking of hatchery fish is being implemented in the Columbia Basin for steelhead and coho salmon and most recently for spring Chinook salmon. Mass marking of fall Chinook salmon has not yet been implemented because of technical, logistic, and funding limitations, except for special cases.

Tribal managers generally disagree with the management strategy for mass marking and selective fisheries. The Service has not made any unilateral decisions on marking but has undertaken actions to comply with ESA Biological Opinions. The Service will continue to coordinate actions with the states and tribes through US v Oregon and NOAA Fisheries to comply with ESA actions and coordinate with PSMFC mark committee. In addition, the federal agencies are beginning discussion of a comprehensive marking strategy for the Columbia River Basin as identified by Action 174-1 in the Federal Columbia River Power System Biological Opinion. The federal agencies (NOAA Fisheries lead) are meeting with the states and tribes to begin this effort.

This Comprehensive Marking Plan should:

1. Improve our ability to assess and monitor the status of naturally-producing (especially ESA listed) populations.
2. Monitor and evaluate hatchery programs, including hatchery reforms and stray rates.
3. Maintain critical harvest management and stock assessment information.
4. Monitor mark-selective fishery regimes established by the states.
5. Improve regional and watershed based marking decisions.
6. Be consistent with recovery plan goals.
7. Be coordinated through US v Oregon, PSMFC and U.S. forums.

Water (Drought):

In the rare event of a severe drought condition and/or declining well water levels, part or all of production fish would be released rather than allowing them to die in the ponds. The number of fish released would be determined according to the amount of water available.

Surplus Adult Salmon Distribution:

Surplus fish or spawned males only can be used for stream enrichment. Females injected with erythromycin cannot be used. Erythromycin has not been cleared for use on food fish by the Federal Drug Administration; therefore, carcasses previously injected with erythromycin cannot be used for human consumption and must be buried on site. In accordance with the Pacific Northwest Fish Health Protection Committee draft Salmon and Steelhead Carcass Distribution Protocols, pre-spawn mortalities cannot be used for stream enrichment and must be buried on site.

Fish passage and Ladder Management:

Adult spring Chinook return to the hatchery from May through July. Years where large adult returns are expected, a weir is installed to regulate the number of fish allowed to enter the facility. Since the hatchery populations are either listed or for restoration purposes, excess fish are not allowed to enter the facility and are forced to return to the Methow River and its tributaries to spawn naturally. There are no stream barriers associated with the fish hatchery.

CHAPTER 4: IMPLEMENTATION

Implementation of the Winthrop NFH program requires input to reimbursable and Service budget processes, as well as compliance with Service policies, legal mandates, and other environmental and human resource laws. This chapter intends to outline these processes and discuss the policy and planning documents which provide guidance to Winthrop NFH in regards to policy, budget, safety, grounds and facilities maintenance.

4.1 Budget Overview

Winthrop National Fish Hatchery receives 100% of its operations budget from reimbursable Bureau of Reclamation (BOR) funds. The funds are administered through the Leavenworth National Fish Hatchery Complex. The Service has a funding agreement with the BOR covering operation and maintenance costs for the Complex as required mitigation for adverse impacts to fish due to the construction of Grand Coulee Dam. Operation budget needs are identified each year and negotiated with BOR (Grand Coulee) to determine the final fiscal year allocation. Deferred maintenance and most construction funding is identified and covered through the reimbursable funding agreement. Some funding for special safety and engineering projects are derived from Service funds. Current budget and number of full-time personnel for Winthrop NFH are provided in Attachment 15. In past years, a portion of operational funds did come from the Service. However, those funds are now directed to stations where the Service has the primary funding responsibility. Hatchery evaluation program funding also is provided by the BOR through MCRFRO activities.

Budgetary Needs and Strategies: Winthrop NFH construction project needs are identified through the Bureau of Reclamation's construction project activity plans, otherwise known as the RAX system. Projects are additionally identified through the Service's Maintenance Management System (MMS), and the Fisheries Operational Needs System (FONS). Access to FONS and MMS files is through the Fisheries Information System (FIS) database. The FIS database consists of five modules which address out-year budgeting (FONS), resource oriented accomplishments that occurred over a fiscal year (Accomplishments Module), Congressionally mandated reporting requirements that describe yearly production at NFH's (Fish and Egg Module), activities related to endangered species (Imperiled Species Module), and deferred maintenance needs (Maintenance Management System).

Fisheries Operational Needs System (FONS): The FONS was established in 1999 as a planning, budgeting, and communication tool to enhance identification of funding and staffing needs for the fishery program. FONS projects are used in budget requests to the Department of Interior and the Office of Management and Budget. Attachment 16 outlines the Regional and National budget formulation, and provides a time step through the process.

Maintenance Management System (MMS): The Maintenance Management System is a national inventory of deferred Service maintenance projects. Deferred maintenance projects are those that can be delayed or do not occur on an annual basis. For most Service owned facilities, the MMS is the primary vehicle used to address maintenance requirements above \$5,000. The database is updated annually, and then forwarded to the Washington Office (WO) for consolidation and submission into the budgetary process. For Winthrop NFH, the primary vehicle used to address maintenance requirements above \$5,000 is the Bureau's RAX system. Thus, projects submitted to the MMS for consideration have been reduced in recent years, as the majority of projects are primarily identified and funded through the RAX system.

RAX System: The RAX is the BOR's maintenance and construction project database, and is the BOR's equivalent to the MMS. Projects are identified in activity plan worksheets and submitted to the BOR-Grand Coulee on an annual basis. Projects in the system can also be updated with annual worksheet revisions. The

RAX system covers immediate construction needs and out-year construction projects.

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 RPI. Scores and Regional priorities are assigned and the information is used in the WO to develop the Five-year Construction Plan. This plan, after it has been approved by the Department 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.

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 and the approved plan is part of the basis of our MMS budget request to Congress (see previous discussion on MMS).

Historic Preservation Integrated with Maintenance Plan: Maintenance of the historic buildings and structures identified on the Winthrop NFH station will follow guidance provided by the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. These guidelines provide information for preserving, rehabilitating, restoring and reconstructing historic buildings. Other guidance published by the National Park Service includes the *Preservation Briefs* series which provide guidance to issues concerning the historic character of buildings such as, "Roofing for Historic Buildings," "Repair and Upgrade of Steel Sash Windows," "New Exterior Additions to Historic Buildings," "Preservation of Historic Concrete," "Heating, Ventilating, and Cooling Historic Buildings," "Mothballing Historic Buildings," and "Seismic Retrofit for Historic Buildings," among others. The *Secretary's Standards* along with all of the *Preservation Briefs* are available on-line at: www.cr.nps.gov/hps/tps/briefs/presbhom.htm.

A process is in-place for all maintenance projects at Winthrop NFH. Maintenance, updating, remodeling, or constructing new facilities will be reviewed by the Region 1, Cultural Resources Team (CRT) in order to ensure consistency with the *Secretary's Standards*. The CRT will be available to answer questions regarding the Standards and provide recommendations for sensitive rehabilitation and preservation of the historic character of the buildings and structures. For instance, the recent seismic retrofit project of the hatchery building, shop, and residences was reviewed by the CRT for consistency with the *Secretary's Standards* and other preservation guidance. Following the *Secretary's Standards* and consulting with the CRT for projects that may potentially alter the character of a historic building are necessary for complying with the NHPA. See below Section 4.2 for specific recommendations for each of the primary buildings.

ESA Compliance and Needs: The 2002 NOAA Fisheries Biological Opinion on Artificial Propagation in the Columbia River Basin lists a host of measures which either must, in the case of Reasonable and Prudent Alternatives, be complied with or, in the case of Conservation Recommendations, should be implemented (NMFS 1999b). Several actions require additional resources. Two of the Conservation Recommendations (CR) discussed below have been implemented at Winthrop National Fish Hatchery.

CR12 Implement programs to apply a cost-effective, externally distinguishable mark to all hatchery fish released in the Columbia River Basin. This measure should assist the action agencies in minimizing adverse effects, and assist NOAA Fisheries in evaluating the effects of hatchery programs on listed and unlisted salmon and steelhead.

CR14. Adopt management strategies to separate returning fish from listed naturally spawning fish through such measures as releasing hatchery fish outside primary natural fish spawning and rearing areas and

removing hatchery fish at weirs.

Additional Conservation Recommendations are: minimize inter-basin stock transfers, emphasize juveniles that are ready to migrate to the ocean and spend a minimum amount of time in the freshwater environment; improve homing and reduce straying; assess carrying capacity and density-dependent effects (unfunded); monitor and evaluate predation (unfunded); conduct spawning ground surveys; assess use of hatchery carcasses for nutrient input (needs development); use most appropriate brood stock for reintroduction into historic or vacant habitats; develop cost-effective externally distinguishable marks to identify hatchery origin fish; modify hatchery programs to conservation/enhancement role (to be identified in HGMP); adopt strategies to separate returning hatchery fish from listed naturally spawning fish; continue adaptive management to improve smolt quality; and continue to coordinate hatchery programs to meet ESA concerns. In addition, a host of measures are associated with an Incidental Take Statement. Reasonable and Prudent Measures are: provide projected hatchery releases to NOAA Fisheries annually; manage programs to minimize potential inbreeding of hatchery and listed fish; monitor and evaluate artificial propagation programs (partially funded); reduce potential negative impacts to listed salmon and steelhead from hatchery operations; and conduct the proposed actions in such a way as to minimize adverse genetic and demographic effects on naturally-produced listed steelhead (to be identified in HGMP). Terms and Conditions include: provide to NOAA Fisheries projected hatchery releases and annual report of releases and returns; mark a representative sample of hatchery salmon and steelhead released to allow M&E (partially funded); develop protocols for fishery augmentation/mitigation programs to reduce potential for interbreeding and genetic introgression (to be identified in HGMP); insure water intakes are properly screened and comply with NOAA Fisheries intake structure criteria (unfunded); implement PNFHPC and IHOT guidelines; monitor effluent for compliance with NPDES permits, and shall minimize the number of hatchery adults remaining to potentially spawn with wild fish through removal of hatchery fish at sufficiently high harvest and/or trapping.

4.2 Service and Station Guidance

Each Service hatchery operates under a variety of guidance and policies. This section is provided to describe some of the more important policy and guidance documents that are available at the hatchery.

Quarters Policy: The Service administers a variety of field offices and National Fish Hatcheries. At many of these hatcheries, including Winthrop NFH, government owned residences are available to employees on a required occupancy basis. 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 will 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. Priority for government quarters occupancy will go to those required to occupy on-station housing as a condition of employment. The current quarter's policy is being revised.

Required On-Station Housing: The intent of having personnel living in government quarters at Winthrop NFH, is to provide station security and operations during non-duty hours. Mechanical systems to regulate water flows must be maintained immediately to prevent loss of valuable fish stocks. Additional security protection of government owned property is provided by occupants especially when anadromous brood stock is present.

Overtime/Compensatory Time/Standby: Regulations governing overtime, compensatory time, and standby are described in the U. S. Fish and Wildlife Service Administrative Manual. Premium pay is discussed in Part 225 FW of the Manual with specific discussions on overtime regulations in Chapter 7.8, callback overtime in Chapter 7.13, Compensatory time in Chapter 7.18, and standby in Chapter 7.22.

Distribution of Surplus Fish/Eggs: Guidance was provided in a July 2001 memorandum from the Regional Director (Attachment 17). 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. The attached Standards of Ethical Conduct for Employees of the Executive Branch, contained in 5 CFR 2635.704, specifically address use of Government property.

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. 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.

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 18). 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 INAD exemption permit issued by the Food and Drug Administration (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.

Employee Training: Regulations governing employee training are described in the U. S. Fish and Wildlife Service Administrative Manual. Career development is discussed in Part 230 FW of the Manual.

Specific Historic Preservation and Maintenance Guidance: The Winthrop NFH has not been thoroughly evaluated for existing assets which warrant historical preservation.

4.3 Service Required Planning Documents

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

Safety and Health Plan: Safety regulations are described in the U. S. Fish and Wildlife Service Administrative Manual. Safety program discussions start in Part 240 FW of the Manual. The facility has its own Station Safety Plan and an additional Safety Plan developed for the Leavenworth NFH Complex.

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. The Winthrop NFH updated its Wildland Fire Management Plan in 2004 to include prescribed fire activities, specifically pile (vegetation) burning.

Integrated Pesticide 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 non-Service lands (Attachment 19).

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 must include consideration of target specificity of the pesticide (insecticide, fungicide, herbicide, etc.), risk to non-target 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.

Station Development Plan: The Station Development Plan considers future growth and construction needs of the facility that are necessary to meet goals and objectives. The plan is an opportunity to work with the Service's Engineering Department to thoughtfully lay out a course of action to maintain the facility in proper operating condition. It is also a necessary precursor to get construction projects on the five-year construction list (see previous discussion).

Station Development Plans were completed for many stations in the early to mid-80s. Most are in need of revision and 1 to 3 stations will be updated each year as funds and personnel availability allow. The Winthrop NFH Station Development Plan was written in 1986. A new plan needs to be written to include new and much needed station improvements

Monitoring and Evaluation Plan: Monitoring and evaluation of production programs are outlined in Hatchery and Genetic Management Plans which can be found at the hatchery, the Mid-Columbia River Fishery Resource Office, or through the Fishery Program Office in Portland. A more detailed discussion of this plan can be found in Chapter 3.

Distribution of Surplus Fish: The Winthrop NFH staff work cooperatively with the Service's Columbia River Fishery Program Office, Mid-Columbia River Fishery Resource Office, Olympia Fish Health Center, and co-managers to plan beneficial uses of fish surplus to hatchery needs in years of large adult returns. Since the facility began rearing listed stocks in the late 90's, most excess fish have been directed back to the river to spawn naturally. The plan considers all possible uses of adult carcasses and live fish in excess of hatchery needs, and is coordinated with co-managers when necessary to achieve mutual goals. A plan should be developed in years where surpluses are anticipated, and should be developed well in advance of spawning operations. These plans can be obtained from the hatchery, the Columbia River Fisheries Program Office (Vancouver, Washington), or through the Fishery Program Office in Portland.

Small Water Systems Management Plan (Drinking Water): The Safe Drinking Water Act (SDWA) delegate's safe drinking water control to the states. FWS must meet state requirements to provide drinking water to the public as well as our employees and their families. The EPA recently indicated that they believe that a significant number of the Service's systems do not fully comply with the SDWA. The Winthrop NFH drinking water supply for the public and employees is fully compliant with both state and Federal standards. The hatchery facility, government quarters, and the adjacent White Ranch are on the Winthrop NFH domestic well system. The facility complies with required quarterly and annual testing. The facility is required to provide water compliant with State and Federal regulations and the Safe Drinking Water Act.

Continuity of Operation Plan: The continuity of Operations Plan provides guidance for Winthrop 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 was updated in December, 2003 and is located at the hatchery in the administrative files.

Spill Prevention, Control and Counter Measure Plan: A Spill Prevention, Control, and Countermeasure Plan (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 Winthrop hatchery to comply with U. S. Environmental Protection Agency oil spill prevention control and countermeasures standards, and inspection reporting, training and record keeping requirements. An SPCC is required at Winthrop NFH because it stores petroleum fuel in above ground storage tanks greater than 660 gallons. The SPCC for Winthrop NFH is current and is available in the hatchery administrative files.

Outreach Plan: An outreach plan (see Chapter 3) details the hatchery's strategy for describing the Service's, Leavenworth NFH Complex's, and the Columbia River Basin's resource history 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).

Watershed/Sub-basin Plan: These documents are part of the Northwest Power Planning Council's process to address fisheries and aquatic issues related to subbasin and recovery planning in the Columbia River basin and in facilitating implementation of recovery actions.

National attention has focused on the Columbia River basin with listings of salmon and steelhead, bull trout and other aquatic species. Endangered Species Act consultations and recovery planning for listed species are having a major impact on management of fishery resources, the economy, and cultural values in the basin. Consultations include the operation of the Federal Columbia River Power System, hatchery operations, harvest actions, habitat planning, and project specific activities. Planning processes include the development of an All-H Paper which is a conceptual recovery plan for salmon, steelhead and other aquatic species in the Columbia River basin, and various state and local government recovery planning efforts in Washington, Oregon, Idaho and Montana. The Pacific Northwest Electric Power Planning and Conservation Act resulted in the establishment of the Northwest Power Planning Council and ultimately the development of its Columbia Basin Fish and Wildlife Program, a comprehensive program to enhance and restore the salmon and steelhead runs and other fish and wildlife resources of the Columbia River basin. The Northwest Power Planning Council is leading a major subbasin assessment and planning effort which will provide key building blocks for aquatic species restoration in the basin. At the same time, the Service has initiated recovery planning for bull trout and NOAA Fisheries for salmon and steelhead. Each of these recovery plans will rely on subbasin planning as major building blocks for recovery of listed species. In addition, Implementation Plans have been developed by the Corps of Engineers, Bonneville Power Administration, and the Bureau of Reclamation that require implementation of significant habitat actions for listed salmon.

There are over 30 different agencies, Indian tribes, councils or commissions with fisheries responsibilities or interests operating in the Columbia River basin. The effective management and restoration of Columbia River basin salmon and steelhead and other aquatic resources depends to a large extent on the ability of these agencies to communicate effectively, resolve differences, develop unified subbasin plans, and work together in a spirit of cooperation in various interagency forums to solve regional and river basin problems.

National Pollution Discharge Elimination System: Winthrop NFH is currently in compliance with the National Pollution Discharge Elimination System (NPDES) permit requirements for effluent discharge from the hatchery. Permits are on file in the administrative files at Winthrop NFH.

Hazardous Waste: Winthrop NFH is currently in compliance with all hazardous waste treatment and control

regulations. Efforts have been made to reduce dependence on products resulting in hazardous waste to the greatest extent possible.

Investigative New Animal Drugs (INAD): No drugs requiring an Investigative New Animal Drug 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.

4.4 Monitoring and Reporting

Fisheries Information System: The FIS is a multifaceted database system consisting of five modules which address unmet management needs (out-year budgeting), accomplishments, deferred maintenance, and other national reporting requirements. This system was previously referenced in "Budgetary Needs and Strategies section. The following paragraphs provide a more detailed description of the modules and their reporting requirements.

Fisheries Operational Needs System: 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.

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, OMB, and Congress. The data structure is a "flip-side" 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, and is available through the hatchery or the Fisheries Program Regional Office in Portland.

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 Fish and Wildlife 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.

Imperiled Species Module: The Imperiled Species Module was designed to capture and report on imperiled species work performed by any Fisheries office. For the purpose of this database, an imperiled species is any species or population that is 1) Federally listed under the ESA as threatened or endangered, 2) petitioned, proposed, or a candidate for Federal listing, or 3) a State-listed or species of special concern. Reporting occurs annually, generally in November.

Maintenance Management System: MMS 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.

Station Guides: The Station Guide provides an overview of the hatchery program and layout. It describes the station location, layout plan, easements or permits in place, water supply, quarters, office and other buildings. The Guide also provides a brief history of the hatchery. This summary document is useful for providing a quick snap-shot to Service employees and parties interested in the hatchery program and facility layout. The Guide is kept current and generally updated annually. Copies can be obtained from the hatchery or the Fisheries Program Regional Office in Portland.

Real Property Inventory: The Real Property Inventory (RPI) provides an annual update on Service real property (anything fixed to the ground or a building). The RPI was maintained by the Realty Branch until automated in the spring of 1999. The update function was “pen-and ink changes to a paper file”. This was changed to an automated system using FileMaker Pro software in FY1999. It was converted to a web-based data base in FY2001. This method of updating the database is expected to continue until FY2004 when it will probably be converted to Maximo/SAMMS, also a web-based database.

Columbia River information System Reports: This database is used at Columbia River Basin hatcheries to record information related to hatchery operations, marking and tagging, juvenile releases, adult returns, etc. The CRiS also is 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.

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