

Warm Springs National Fish Hatchery Operational Plan and Implementation Plan 2002-2006



Developed by
The Confederated Tribes of the
Warm Springs Reservation of Oregon
And
United States Fish and Wildlife Service



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**WARM SPRINGS NATIONAL FISH HATCHERY
OPERATIONAL PLAN and IMPLEMENTATION PLAN
2002-2006**

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Warm Springs National Fish Hatchery Operational Plan 2002-2006

BACKGROUND

The tribes, states, and federal government share the responsibility to protect and enhance fish runs and fish habitat. The right of the tribes to govern their members and manage their territories and resources flows from tribal sovereignty as recognized by treaty. The federal government and its implementing agencies owe an affirmative duty to use their expertise and authority in meaningful consultation with the tribes to safeguard natural resources that are of crucial importance to self-government and prosperity.

In 1959, The Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) requested that the U.S. Fish and Wildlife Service (USFWS) investigate the possibilities of salmon and steelhead enhancement on the Reservation. It was believed that some potential spawning and rearing areas for anadromous fish in the system were underutilized due to passage problems (Cates 1981). Weir counts of salmon and steelhead entering the Warm Springs River were initiated in 1963. That same year, the CTWSRO requested that the USFWS initiate hatchery feasibility studies on the Reservation.

Construction of Warm Springs National Fish Hatchery (WSNFH) was authorized by an Act of Congress on May 31, 1966 to stock the waters of the Warm Springs Reservation of Oregon. It was expected that the hatchery would produce about 1.0 million salmon and trout annually providing substantial economic benefits to the CTWSRO through the sale of fishing permits and related enterprises, as well as employment and training opportunities (USFWS and CTWSRO 1983).

For the tribes, the cultural and spiritual value of salmon is immense. Salmon are an essential aspect of tribal nutritional health and a part of spiritual and cultural identity. The annual return of the salmon allows the transfer of traditional values from generation to generation. Because the Warm Springs tribal population is growing, the need for salmon is more important than ever.

The operation of WSNFH was considered to be pivotal for the enhancement of the anadromous fish runs as well as for meeting the resident salmonid program needs of the CTWSRO. Among the Tribal priorities was and still is the enhancement of anadromous fish runs in all Reservation waters to meet the future needs of the resource as well as those of the Tribe.

The WSNFH Master Plan was developed in 1971. The first Warm Springs National Fish Hatchery Operational Plan was developed and approved in October, 1977. Full production began in 1978 and included spring chinook salmon, summer steelhead, and rainbow trout.

The initial spring chinook salmon program required 355 spawners. Based on recent run years, every third fish in the run was to be retained for broodstock. If necessary, no more than 1/2 of the run would be taken for hatchery broodstock. Upon realizing returns from hatchery production, 1/2 of the broodstock needed would be randomly selected from marked fish and 1/2 from unmarked fish (USFWS and CTWSRO 1977). The objectives for hatchery operations were to maintain genetic integrity while enhancing the Warm Springs River stocks by producing and releasing fish indistinguishable from native stocks. Upstream escapement was to be maintained at recent levels by releasing fish in excess of hatchery needs.

The steelhead program was discontinued in 1981 because of disease and growth problems and physical limitations of the facility. The spring chinook salmon broodstock need was expanded to 900 adults (USFWS and CTWSRO 1983).

In 1984 the CTWSRO asserted that separating the hatchery and natural producing fish would “ultimately best serve the fish and our people into the future”. The CTWSRO proposed a two-stock concept, whereby only wild (unmarked) fish would be passed above the hatchery (Stainbrook and Greene 1984; Jackson 1984). This was to assure maintenance of genetic integrity within the naturally producing stock, to allow for future management alternatives in the Deschutes River spring chinook stocks, to evaluate the performance of the WSNFH through positive fish identification, and to provide consistent long term data on the life-history patterns and possible changes which may occur within the stocks.

Beginning with the 1984-1987 Operational plan, hatchery broodstock was to consist of returning hatchery adults and a number of unmarked native stock not to exceed 10% of the total return to the hatchery weir. The hatchery was to reduce the number of wild adults taken for broodstock when wild returns were low, to ensure that at least 1,000 wild adults were passed above the hatchery. If marked fish returns did not amount to 567 adults, unmarked adults in excess of the 10% limitation were to be retained and utilized to reach the minimum broodstock requirement.

The CTWSRO and the USFWS, with input from the Oregon Department of Fish and Wildlife (ODFW) and the National Marine Fisheries Service (NMFS) has designed recent operational plans to minimize the impacts of the hatchery on the existing wild stocks of spring chinook spawning in the Warm Springs River by utilizing only Warm Springs River stocks in the hatchery, limiting hatchery take of wild broodstock to a percentage of the total run, retaining broodstock proportionally throughout the run, and annually including up to 10% wild fish in the hatchery broodstock.

The continuing goal of the CTWSRO and USFWS is to cooperatively manage WSNFH in a manner that will protect remaining wild fish populations and preserve their genetic integrity, maintain the existing physical characteristics of Warm Springs anadromous fish stocks and their production above the hatchery, and not impact fish populations below the hatchery while abiding by the goals and objectives of the Deschutes River Subbasin Salmon and Steelhead Plan (ODFW and CTWSRO 1990) and the Integrated Resource Management Plan I for Forested Areas of the Reservation (CTWSRO 1992).

The means for accomplishing this goal are discussed in the enclosed Operational Plan for WSNFH among which are the following goals and objectives:

- Maintain stock integrity and genetic diversity of the hatchery and wild stocks.
- The goal for the wild spring chinook populations is to have abundant self sustaining runs that fully seed available habitats to their production potential, with harvestable surpluses.
- The CTWSRO's minimum escapement objective for wild spring chinook salmon above WSNFH is 1,300 adults.
- Produce up to 750,000 healthy, externally clipped spring chinook salmon smolts for on-station release.
- Approximately 10% of the hatchery broodstock will be of wild fish origin.
- Only wild (unmarked) steelhead will be passed above the hatchery weir.
- Monthly and annual coordination meetings will be held between the CTWSRO and the USFWS.
- All other native fish entering the trap will be passed upstream or allowed to pass upstream volitionally.

This plan will be revised every five years to meet the changing needs of the resource or operations of the hatchery and to meet management objectives.

**Warm Springs National Fish Hatchery
Operational Plan
2002-2006**

INTRODUCTION

Warm Springs National Fish Hatchery (WSNFH) was authorized by Federal Statute 184 on May 31, 1966 to stock the waters of the Warm Springs Reservation of Oregon with salmon and trout. The hatchery is operated by the United States Fish and Wildlife Service (USFWS) on lands leased from the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO).

WSNFH began fish production in 1978 with eggs from spring chinook salmon and steelhead captured from the existing natural runs passing the hatchery site. The steelhead program was terminated in 1981.

The hatchery has the capacity to produce 750,000 spring chinook salmon smolts resulting in a broodstock requirement of about 630 adults.

The USFWS recognizes that the CTWSRO has the principal management responsibility for fishery resources on the Warm Springs Reservation. The USFWS and the CTWSRO enter into this operational plan with the objective to assure that the operation of the hatchery is compatible with, and compliments the CTWSRO's fishery management goals. The steps necessary to meet this objective are outlined in the following portions of this plan.

SPRING CHINOOK PROGRAM

The adult production goal from the 750,000 smolts released at WSNFH is at least 2,250 adults returning to the mouth of the Deschutes River.

The escapement objective for wild spring chinook salmon is a minimum of 1,300 wild adults released above the hatchery to spawn naturally.

The goal is to have, on a 10 year average, 10% of the hatchery broodstock of wild fish origin. A sliding scale for wild broodstock retention based on projected wild fish returns will be used as follows:

Projected Wild Escapement	Wild fish retained for WSNFH brood	Percent of hatchery brood Contributed by Wild Fish
<800	0	0
800-899	31	5
900-999	38	6
1000-1099	45	7
1100-1199	50	8
1200-1299	57	9
1300-1399	63	10
1400-1499	69	11
1500-1599	76	12
1600-1699	82	13
1700-1799	88	14
1800-1899	95	15
1900-1999	100	16
2000-2099	107	17
2100-2199	113	18
2200-2299	120	19
>2300	126	20

No wild fish will be retained for hatchery broodstock when the predicted escapement of wild spring chinook salmon above WSNFH is less than 800. This practice will help promote wild fish escapement and the retention of wild genetic traits in the hatchery broodstock. If hatchery brood needs are changed from 630, the number of wild fish retained for the hatchery brood will follow the sliding scale, and percent of wild fish in the brood will vary in proportion to total brood need.

A systematic approach to the selection and spawning of spring chinook salmon broodstock will be used to preserve the natural characteristics inherent to the native run. The total broodstock requirement will normally be 630 adults.

The procedures to be followed in the selection, spawning, and rearing of spring chinook salmon at WSNFH are listed below:

1. Spring chinook salmon from the Warm Springs River will be the stock of choice to be used at the hatchery.
2. If the wild run allows, it is the policy that at least 63 wild adults be spawned with the hatchery stock.
3. Retrieval of fish for hatchery broodstock shall be random and occur throughout the run. Fish that are 60 cm or longer will be considered adults. In addition, between 2% and 5% of the broodstock will be fish less than 60 cm in length, based on the percentage of jacks in the wild population and their estimated contribution during spawning.
4. If hatchery fish return in numbers above broodstock needs, they will be reserved to meet other Warm Springs Reservation needs as identified by the CTWSRO.
5. Handling of wild fish will be minimized by operation of the fish passage system. Operation of the system will occur as outlined in the attached implementation plan.
6. All fish handled at the hatchery will be injected with erythromycin to control prespawning mortality caused by Bacterial Kidney Disease (BKD) and to reduce vertical transmission of the causative agent to the offspring. Fish held for broodstock will be injected twice with a dosage of 10-20 mg/kg body weight. Fish will not be injected when water temperatures exceed 60°F or within 30 days of spawning.
7. Adults (wild and hatchery origin) to be held for the hatchery program and for supplementation outplants will be collected proportionately throughout the run based on wild stock run timing to ensure that run timing for both stocks are maintained. The intent is to utilize a spawning population of 630 adults and to use a 1:1 male to female spawning ratio.
8. At spawning, all fish used for brood production will be examined for BKD using the enzyme-linked immunosorbent assay (ELISA) and given a fish health exam as outlined in the USFWS Fish Health Policy and Implementation Guidelines (USFWS 1995). Carcasses of brood fish to be outplanted in Reservation streams for nutrient enrichment will be tagged and frozen after spawning until disease screening is complete. To minimize risk of passing infection to wild populations, only carcasses of pathogen-free or low risk fish will be outplanted.
9. All juvenile spring chinook salmon released from the hatchery will be adipose fin clipped to visibly differentiate them from wild fish upon return. Additionally, 100% of hatchery released fish will be coded wire tagged (CWT) which will allow the automated passage system to pass wild (untagged) returning adults upstream of the hatchery without being handled.

Other marking may occur to evaluate specific fish cultural practices or for hatchery contribution studies. Such studies may be implemented by the USFWS at no expense to the CTWSRO, but

only after discussions with CTWSRO. Ongoing studies will be reviewed annually. A written report of progress and results to date will be completed by the principal investigator and distributed to Hatchery Evaluation Team members, and presented as requested to Tribal Fish and Wildlife Committee and at the annual coordination meeting between CTWSRO and USFWS.

10. All juvenile releases will be at the hatchery except to meet Tribal requests. The CTWSRO will be notified in writing two weeks prior to release. The CTWSRO will notify WSNFH in writing that it has received the release plans.

11. In addition to this Operational Plan, all procedures and policies described in the attached "Warm Springs National Fish Hatchery Implementation Plan 2002-2006" will be adhered to by the Parties to this plan.

STEELHEAD PROGRAM

In 1981, the steelhead hatchery program at WSNFH was discontinued primarily due to disease problems and the apparent physical limitations of the facility in rearing two-year-old steelhead smolts. Using WSNFH to protect wild steelhead is the current goal of the CTWSRO and the USFWS. To meet this goal, only wild steelhead will be passed above WSNFH and all known hatchery origin steelhead will be sacrificed and distributed to the CTWSRO. The heads from stray hatchery steelhead will be tested for the parasite that causes whirling disease (WD). The trap at WSNFH will be operated year round, weather and river conditions permitting. Catch summaries will be submitted to the CTWSRO each month.

TROUT PROGRAM

At the request of the CTWSRO, WSNFH will arrange for rainbow trout to be delivered to WSNFH for stocking in the Warm Springs River at Kah-Nee-Ta resort. The Tribe will pay for purchase and transport of the fish. The USFWS/WSNFH will maintain the fish and stock into the Warm Springs River according to a schedule agreed to by the CTWSRO and WSNFH. Only Deschutes River origin hatchery rainbow trout which are resistant to the parasite *C. shasta* will be stocked into the Warm Springs River.

Trapped bull trout will be enumerated and approximate lengths recorded. Additionally, trapped bull trout will be examined for tags and/or marks, and presence of radio tags (antenna protruding from body). The collected data will be submitted to the CTWSRO as requested.

OTHER FISH

All other native fish species entering the WSNFH fish ladder will be passed or allowed to pass upstream.

TIME SPAN

This operational plan shall be in effect from the time of signing until December 31, 2006. At that time, a new agreement will be established for future years. Alterations to this plan shall have the mutual agreement of both parties.

Warm Springs National Fish Hatchery Implementation Plan 2002-2006

INTRODUCTION

Warm Springs National Fish Hatchery (WSNFH) is located at Rm 9 on the Warm Springs River, approximately 14 mi north of Warm Springs, Oregon. The hatchery is operated by the U.S. Fish and Wildlife Service (USFWS) on lands leased from the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO).

WSNFH began fish production in 1978 with eggs from spring chinook salmon and steelhead captured from the existing wild runs passing the hatchery site. Rainbow trout were raised at the hatchery for planting in reservation waters. The steelhead hatchery program was terminated in 1981 and the spring chinook salmon program was expanded to fully utilize hatchery production potential.

All water rights on the Warm Springs River are the property of the CTWSRO. Nonconsumptive water use is included in the business lease between the CTWSRO and the USFWS. The lease specifies use of approximately 100 cfs (44,883 gpm) to be supplied by pumping from the Warm Springs River. Water use currently ranges from 20-40 cfs (9,000 gpm to 18,000 gpm). All rearing ponds are supplied with single-pass water. An advanced engineering plan is being developed for a re-use/ozone water supply/disinfection system.

The USFWS recognizes that the CTWSRO has the principal management responsibility for fishery resources on the Warm Springs Reservation. The USFWS and the CTWSRO enter into this operational plan with the objective to assure that the operation of the hatchery is compatible with, and compliments the CTWSRO's management goals as described within. The steps necessary to meet this objective are outlined in the following portions of this plan.

PURPOSE

At the request of the CTWSRO, WSNFH was authorized by Federal Statute 184 on May 31, 1966 to stock the waters of the Warm Springs Reservation with salmon and trout to increase fishing opportunities. The facility is now used for adult collection, egg incubation, rearing of spring chinook salmon, holding rainbow trout for planting in reservation waters, and for enumerating fish, including wild chinook salmon, steelhead, rainbow trout and bull trout passing the facility.

GOALS

- Produce spring chinook salmon that will contribute to fisheries in the Deschutes River while providing escapement for hatchery production.
- Minimize negative effects of production of hatchery spring chinook salmon on indigenous fish species.
- Monitor and evaluate the health of wild and cultured fish populations.
- Monitor and evaluate the ecological effects attributable to the specific hatchery products following release.
- Monitor and evaluate genetic effects of artificially propagated fish on wild and cultured populations.
- Minimize disease impacts to indigenous fish by releasing healthy smolts.
- Minimize competition/interaction between hatchery fish and indigenous fish.
- Ensure that hatchery operations are compatible with the CTWSRO's fishery management goals.
- Maintain close interagency communication and coordination between the CTWSRO, USFWS, and the Oregon Department of Fish and Wildlife (ODFW).

OBJECTIVES

Objective 1: Protect indigenous fish populations.

-The goal for the wild spring chinook populations is to have abundant self sustaining runs that fully seed available habitats to their production potential, with harvestable surpluses.

- The CTWSRO's minimum escapement objective for wild spring chinook salmon above WSNFH is at least 1,300 adults (60 cm or greater).

Objective 2: Hatchery production:

- Produce up to 750,000 healthy, externally clipped and coded wire tagged (CWT), spring chinook salmon smolts for on-station release.

- Produce a return to the mouth of the Deschutes River of at least 2,250 hatchery spring chinook salmon.

Objective 3: Maintain stock integrity and genetic diversity of the hatchery and wild stocks through proper management of genetic resources.

Objective 4: Maximize survival at all life stages using disease control and disease prevention techniques. Prevent introduction, spread, or amplification of fish pathogens.

Objective 5: Minimize interactions with indigenous fish populations through proper rearing and release strategies.

Objective 6: Monitor and evaluate wild and hatchery spring chinook salmon populations and production.

Objective 7: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health.

Objective 8: Stock the lower Warm Springs River with catchable trout as requested by CTWSRO.

Objective 9: Design and implement projects to improve quality of production at WSNFH.

Objective 10: Effectively communicate with other salmon producers and managers in the Columbia River Basin.

CURRENT PRACTICES TO ACHIEVE OBJECTIVES

Objective 1: Protect indigenous fish populations.

Only known indigenous fish species will intentionally be passed above WSNFH. The CTWSRO's escapement objective for wild spring chinook salmon above WSNFH is at least 1,300 adults. The escapement objective was developed by the CTWSRO and ODFW based on a stock-recruitment analysis developed by Lindsay et al. (1989) and updated annually by the CTWSRO and USFWS. The escapement objective takes into account pre-spawning mortality. There is no maximum escapement objective. The goal for the wild spring chinook populations is to have abundant self sustaining runs that fully seed available habitats to their production potential, with harvestable surpluses.

WSNFH will be operated to minimize negative impacts of hatchery production on indigenous fish populations. WSNFH will be operated in compliance with all regionally adopted genetics, fish health, ecological interactions, and hatchery performance standards (IHOT 1995).

The best available information will be used to determine appropriate operating standards at WSNFH.

Objective 2: Hatchery production

Adult collection and juvenile release

The current hatchery broodstock need is 630 adult fish to produce a release of up to 750,000 healthy smolts. This release target is the maximum capacity of the hatchery. A return to the hatchery of 630 fish should result in an egg take of 884,500 eggs based on a 90% prespawning survival, a return that is 60% female, and an average fecundity of 2,600 eggs/female. On average, green egg to eye, eye to fry, and fry to smolt survival is 95%. Broodstock needs may be adjusted if rearing density studies indicate better returns from smaller release groups reared at lower densities than current production levels.

With greater than average egg to smolt survival (85%), the broodstock goal of 630 will produce greater than 750,000 smolts, exceeding the rearing capacity of WSNFH. When rearing capacity is anticipated to be exceeded, eggs will be discarded from females with the highest ELISA values.

Up to 750,000 juvenile fish will be released from the hatchery into the Warm Springs River. Approximately 10% of this production is volitionally released in the fall, from early October to late November, with most production releases occurring the following spring during March and April. The release is usually completed by mid-April to make room for the next year's brood.

Adult returns

The return goal for WSNFH fish to the mouth of the Deschutes River is 2,250 adults and jacks based on the average juvenile-to-adult survival rate of 0.3% for brood years 1978-1996.

Returns above production needs will be distributed to the CTWSRO. In years with poor returns to Round Butte Hatchery (RBH), transfer of WSNFH fish to RBH will be considered. Additional uses of excess returning hatchery spring chinook may include outplanting of live adults to supplement or reestablish naturally spawning populations in suitable habitat or outplanting spent carcasses for nutrient enrichment in underseeded stream reaches. Concerns of disease transmission, genetic impacts to wild chinook stocks and other species, and carrying capacity of the habitat will be evaluated prior to implementation of adult or carcass outplanting programs.

Pre-season and in-season run predictions and average run timing will be used by WSNFH staff to determine when fish will be distributed.

CTWSRO and USFWS staff will continue looking at available information to determine if return goals are appropriate.

Objective 3: Maintain stock integrity and genetic diversity through proper management of genetic resources.

Broodstock selection

The return of wild and WSNFH spring chinook salmon will be projected preseason and updated in-season using all available information including run timing and returns to date. Olson and Spateholts (2001) examined 13 years (1987-1999) of return timing data collected at the hatchery. Wild and hatchery fish returned to the Warm Springs River from late April through September, spawning from late August through September. Most wild and hatchery fish returned to the Warm Springs River by late June. However, in the early part of the run, hatchery fish typically had a one to two week lag in their return when compared to wild fish (Figure 1). For example, by May 31 of each year, an average 64% of the wild and 49% of the hatchery fish had returned to the Warm Springs River. By June 30 of each year, an average 89% of the wild and 85% of the hatchery fish had returned.

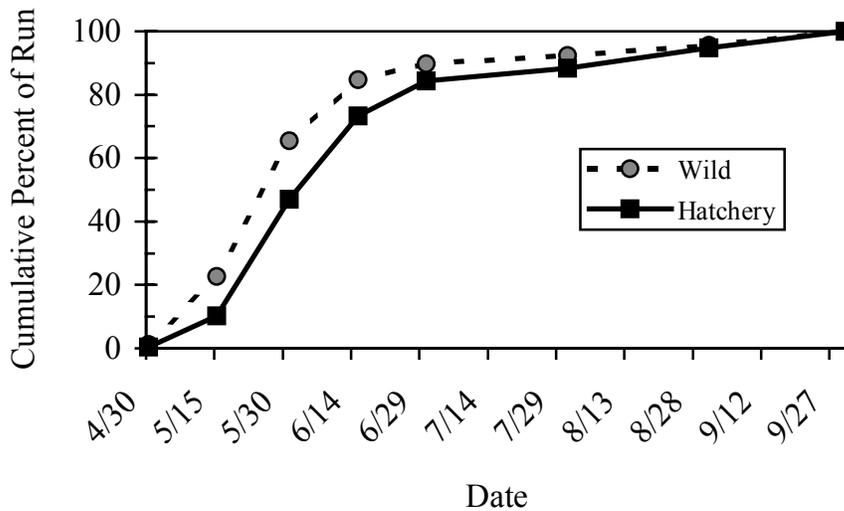


Figure 1. Cumulative run timing (%) of wild and hatchery spring chinook salmon returning to the Warm Springs River, 1987-1999.

Adults (hatchery and wild origin) to be retained for the hatchery program or for outplants will be collected proportionately throughout the run based on **wild stock run timing** to ensure that run timing for both stocks are maintained as follows:

Date	Cumulative Percent of Brood Collected
May 8	12
May 15	24
May 23	45
May 31	67
June 8	77
June 15	86
June 23	89
June 30	91
July 31	93
Aug 25	100

The goal is to have, on a 10 year average, 10% of the hatchery broodstock of wild fish origin. A sliding scale for wild broodstock retention based on projected wild fish returns will be used as follows:

Projected Wild Escapement	Wild fish retained for WSNFH brood	Percent of hatchery brood Contributed by Wild Fish
<800	0	0
800-899	31	5
900-999	38	6
1000-1099	45	7
1100-1199	50	8
1200-1299	57	9
1300-1399	63	10
1400-1499	69	11
1500-1599	76	12
1600-1699	82	13
1700-1799	88	14
1800-1899	95	15
1900-1999	100	16
2000-2099	107	17
2100-2199	113	18
2200-2299	120	19
>2300	126	20

No wild fish will be retained for hatchery broodstock when the predicted escapement of wild spring chinook salmon above WSNFH is less than 800. This practice is intended to promote both wild fish escapement and the retention of wild genetic traits in the hatchery broodstock. If hatchery brood needs are changed from 630, the number of wild fish retained for the hatchery brood will follow the sliding scale, and percent of wild fish in the brood will vary in proportion to total brood need. Wild fish retained for hatchery brood will be selected proportionately based on cumulative run timing.

Spawning protocol

The intent is to utilize a spawning population of 630 fish and to use a 1:1 male to female spawning ratio. When the number of returning males is low, the male to female spawning ratio will be 1:2. When less than 400 broodstock are available, in order to increase effective population size, the number of eggs taken from each female will be divided in half and each half fertilized with gametes from a different male. Males will be used with more than one female only as often as necessary to fertilize the eggs of all females. Attempts will be made to include all of the males in the same number of matings. Fish that are 60 cm or longer will be considered adults. Between 2% and 5% of the broodstock will be fish less than 60 cm in length, based on the percentage of jacks in the wild population and their estimated contribution during spawning. On average, 10% of the broodstock will be wild fish when returns allow.

Only spring chinook salmon indigenous to the Warm Springs River will be used for broodstock. During years with low returns to the hatchery, RBH eggs will be considered for transfer to WSNFH. In this situation, Round Butte stock would be spawned at RBH with green eggs transferred to WSNFH. Round Butte stock fish reared at WSNFH would be marked differently from the Warm Springs stock, to distinguish them from WSNFH fish upon return. RBH fish returning to WSNFH would be excluded from the broodstock and distributed to the CTWSRO or to RBH if needed. If returns to WSNFH are projected to be below broodstock needs, RBH fish returning to WSNFH would be spawned with eggs and juveniles reared separately from WSNFH stock, and juveniles marked differently.

Genetics testing is recommended to determine if WSNFH, RBH, and wild spring chinook salmon are genetically similar. Both hatchery broodstocks were developed using wild spring chinook salmon from the Deschutes River. Sampling protocol for genetic testing will be determined by the USFWS regional geneticist and approved by HET and CTWSRO Fish and Wildlife Committee.

Objective 4: Maximize survival at all life stages using disease control and disease prevention techniques. Prevent introduction, spread, or amplification of fish pathogens.

Disease prevention

- Hatchery operations will comply with the USFWS Fish Health Policy and Implementation Guidelines and the Integrated Hatchery Operations Team's (IHOT) Fish Health Policy.
- Pond management strategies will be utilized to help optimize the quality of the aquatic environment and to minimize fish stress which can amplify pathogens resulting in disease outbreaks.

Health monitoring

- On at least a monthly basis, beginning at two months after starting feed until release, a minimum of 10 fish from each fish lot will be examined to help assess health status and to detect problems before they progress to clinical disease or mortality.
- Three to six weeks prior to release or transfer, 60 fish from each lot will be given a health exam. If fish are held longer than one month from the designated release date, a second exam will be done.
- Whenever abnormal behavior or mortality is observed, the fish health specialist will examine the affected fish, make a diagnosis, and recommend the appropriate remedial or preventative measures.

- At spawning, all fish used for brood production will be examined for health as outlined in the USFWS Fish Health Policy and Implementation Guidelines. All fish will be tested for bacterial kidney disease (BKD) using the ELISA procedure.
- As needed, additional health testing will be done to evaluate hatchery protocols and procedures or to support special studies.

Therapeutic and prophylactic treatments

- At spawning, eggs will be water-hardened in iodophor as a disinfectant. The current protocol uses 75 ppm iodine for 20 minutes which is safe and deemed equivalent to the USFWS Fish Health Policy requirement.
- Fertilized eggs from each female will be incubated separately until eye-up. After eye-up, eggs will be segregated based on the females BKD group, as measured by ELISA, and reared separately until release.
- Formalin (37% formaldehyde) will be dispensed into water if necessary for the control of fungus on eggs and the control of parasites on juvenile and adult salmon. Treatment dosage and time of exposure will vary with the condition being treated.
- Only therapeutants approved by the U.S. Food and Drug Administration or those under Investigative New Animal Drug (INAD) permits will be used for treatments. In special circumstances, veterinarian prescribed treatments may be used if recommended by the USFWS Fish Health Center.
- Juvenile fish will be administered antibiotics orally in their feed when needed for the control of bacterial infections. Under INAD permit, spring and late summer feedings of erythromycin, each at 21 to 28 days, are currently used to control BKD in the subyearlings.
- All spring chinook salmon held for broodstock and for outplanting will be injected with erythromycin to prevent prespawning mortality by BKD and to reduce vertical transmission of its causative agent to their progeny. Fish will be injected twice with a dosage of 10-20 mg/kg body weight. Wild fish handled in the hatchery will also receive an injection prior to release above the hatchery weir. No wild fish will be injected when water temperatures exceed 60°F or within 30 days of spawning.

Fish and egg movements

- Movements of fish and eggs will be conducted in accordance with IHOT's Policies and Procedures guidelines and the USFWS Fish Health Policy and Implementation Guidelines. Carcasses outplanted for nutrient enrichment must be certified pathogen – free or of minimum risk.

Sanitation

- Sanitation procedures as given in the IHOT Policies and Procedures will be followed at WSNFH to prevent the spread of pathogens. This includes frequent removal and proper disposal of dead fish/eggs, the use of disinfected net/other equipment for each pond or tank, disinfection of equipment, vehicles and facilities after use, and regular pond cleaning.

Objective 5: Minimize interactions with indigenous fish populations through proper rearing and release strategies.

Specific hatchery practices such as fish size at release, time of release, acclimation, and the use of volitional release will be used to minimize interactions between hatchery fish and indigenous populations.

The total production target is up to 750,000 healthy spring chinook salmon smolts. Approximately 10% of these fish leave in the fall. The remaining fish are released the following spring as 1+ age smolts.

All juvenile spring chinook salmon released from WSNFH will be externally marked to differentiate them from wild fish upon return. Juvenile fish will be marked in the spring of their first year. Additionally, 100% of hatchery released fish will be coded wire tagged (CWT), which will allow the automated passage system to pass wild (untagged) returning adults upstream of the hatchery without being handled. These fish will be sampled by the USFWS for mark quality and tag retention prior to release. The goal is a minimum tag retention of 95%. Parties to this plan will make every effort to achieve this tag retention goal.

CTWSRO and USFWS staff will continue looking at available information to determine if juvenile production goals are appropriate, including method, number, size and timing of releases.

The effect of releases of juveniles from the hatchery on wild fish needs to be closely examined, especially in regards to the fall release program. Differential marking, tagging, downstream monitoring, scale analysis, and other potential projects will be used to determine the fate of fall migrants.

All juvenile releases will be at the hatchery except to meet CTWSRO requests. Additional release sites may be used for establishment of a terminal fishery in White River and for studies associated with reestablishment of anadromous fish passage above the Pelton/Round Butte hydroelectric facilities. WSNFH will notify the CTWSRO in writing two weeks prior to any releases. The CTWSRO will notify WSNFH in writing after receiving the release notice.

The CTWSRO operates a migrant trap near the mouth of the Warm Springs River. During volitional releases from WSNFH, the CTWSRO will operate this trap to estimate the number of hatchery fish leaving the system and will biosample a representative number of fish. The CTWSRO will pull the trap during forced releases or if fish numbers become unmanageable.

Objective 6: Monitor and evaluate wild and hatchery spring chinook salmon populations and production.

Run size estimates

Pre-season estimates of wild, WSNFH, and RBH adult and jack returns will be completed prior to returns in April. The CTWSRO and the USFWS will formulate run predictions using the best available information. The CTWSRO and the USFWS will co-author a report detailing pre-season run predictions for Warm Springs River stocks returning to the Deschutes River. The CTWSRO and the USFWS will jointly work with the ODFW to estimate returns of RBH spring chinook salmon to the Deschutes River. In-season run size estimates will be made throughout the run using all available information.

Fish passage system

Spring chinook salmon

An automated fish passage facility has been installed for use during the spring chinook migration time period, April 16 - September 30. The system is designed to minimize handling of the wild fish by separating returning hatchery fish with coded wire tags (CWTs) from other fish attempting to pass the barrier dam. The system detects CWTs in the hatchery fish and diverts these fish into a separate holding area. The system allows wild fish and fish without CWTs to proceed upstream without being handled. Wild fish will be monitored and enumerated using video technology and then directed to the fish ladder to continue their upstream migration without being handled.

The automated passage system at WSNFH will be operated daily from April 16 - September 30. Only wild fish, without CWTs, will be intentionally passed above the hatchery. We realize, however, that hatchery fish missing CWTs and poorly clipped fish may be inadvertently passed above the hatchery. Steelhead may still be passing WSNFH in April. If stray hatchery steelhead are detected passing the hatchery or if the inadvertent passage of hatchery chinook exceeds 10% of the total upstream escapement, WSNFH staff will inform CTWSRO staff and a decision will be made on whether or not to delay using the automated fish passage system.

The system will be operated to allow volitional upstream migration. Wild fish will not be left overnight in the trap, unless trapping efficiency is being evaluated.

Videotapes will be reviewed by WSNFH staff to estimate wild fish passage above the hatchery. Estimated returns of wild and hatchery fish to WSNFH will be reported to CTWSRO staff on Tuesday of each week.

The minimum operating standards for the system are the removal of 95% of the fish with CWTs and a 95% accuracy in counting upstream-bound-fish. With 95% tag retention and 95% removal of fish with CWTs, no more than 10% of the total chinook passed upstream should be of hatchery origin.

The system must be tested for efficiency of separation and counting at activation and at least one night per month. This should coincide with biosampling. Efficiency testing will require that fish diverted into the wild catch pond be held over night. These fish will be crowded, anesthetized, and examined for fin clips and the presence of CWTs. Handled fish will be injected with erythromycin if water temperature is below 60° F, and wild fish released upstream. Video tapes will be viewed and verified at this time. If the passage system is not operating within the minimum operating standards, necessary adjustments will be made. If adjustments are not sufficient, the system will be bypassed and all fish will be taken into the hatchery and sorted by hand. The CTWSRO staff will be notified of the situation and a decision on how to proceed will be negotiated. During the peak of the migration, the trap will be tested daily using a dummy outfitted with a CWT.

Use of the passage system may be curtailed with agreement of the Parties. Potential reasons to curtail use of the system include all Parties agreeing that the wild fish need to be injected with erythromycin, the minimum operating standards are not being met, or other unforeseen circumstances.

Indicators to reinstate injections of erythromycin may include but not be limited to: estimated high pre-spawning mortality in two or more consecutive years (>3.1 fish per redd), low egg to smolt survival, and high levels of *Renibacterium salmoninarum* (the causative pathogen of BKD) found in wild smolts trapped at the mouth of the Warm Springs River.

Minimum operating standards may not be met if the return ratio of wild fish to WSNFH hatchery fish is projected to be low or tag retention of WSNFH fish is poor.

A protocol will be developed detailing operation of the fish passage system. This protocol will continually be updated based on continued testing and updating of the system

Wild smolt disease sampling

While the automated fish passage system is in operation, wild spring chinook salmon volitionally passing upstream of the hatchery will not be injected with erythromycin. To monitor the potential effects of stopping the injections, wild smolts emigrating from the Warm Springs River may be sampled for levels of *R. salmoninarum*. Prior to sampling, the USFWS will submit a request to the CTWSRO, detailing the sampling plan, and receive permission from the Fish and Wildlife Committee to proceed.

Summer steelhead

The steelhead hatchery program was terminated in 1981, primarily due to disease problems and the physical limitations of the facility to rear two-year-old steelhead smolts. Currently, there are no plans to reinstate this program. This agreement, however, does not prevent a steelhead program from being developed in the future.

The current goal is to use the hatchery to protect wild steelhead. The automated fish passage system will not be used during the steelhead migration (February - April 15). The hatchery trap, however, will be operated and all fish handled in the hatchery. Only wild steelhead will be passed above WSNFH. All known hatchery origin steelhead will be sacrificed and distributed to the CTWSRO. Stray hatchery steelhead may be sampled for pathogens, including whirling disease. Catch summaries will be submitted to the CTWSRO each month.

Other Fish

The trap at WSNFH will be operated year round. Monthly estimates of passage will be provided to Tribal staff. Rainbow trout and bull trout handled at WSNFH will be enumerated and their lengths recorded. Bull trout will be examined for presence of marks and tags, including antennae of radio tags. The collected data will be submitted to the CTWSRO with the monthly trap summaries. All other fish species will be counted and passed upstream.

Biosampling

Wild and hatchery salmon will be biosampled by the USFWS and CTWSRO staff. Biosampling is necessary to monitor size, age structure, sex ratios and mark retention of returning adults. Biosampling of wild salmon will coincide with trap efficiency testing. Approximately 10% of the wild run will be biosampled. Fish will be anesthetized and measured (cm). Three to four scales will be removed and aged. Surplus hatchery fish donated to the tribes for consumption will be anesthetized with carbon dioxide. All hatchery fish and wild fish held for broodstock will be sampled at time of spawning. Hatchery fish will have CWTs removed and read by the USFWS within 30 days from the last day of spawning. All wild chinook salmon handled will be injected with erythromycin before being released above the hatchery, unless water temperature exceeds 60° F or within 30 days of spawning.

A minimum of 500 surplus hatchery fish + 500 hatchery broodstock will be sampled to recover coded-wire tags. Typically, sampling of surplus hatchery fish will occur on each Monday, throughout the run from May through August, sampling about 40% of the return.

Hatchery production studies

The Hatchery Evaluation Team (HET) for WSNFH is composed of representatives from the CTWSRO, WSNFH, and the USFWS Columbia River Fisheries Program Office and Lower Columbia River Fish Health Center. Abernathy Fish Technology Center staff are available for assistance as well.

All proposed studies must be approved by the HET. A research proposal, developed following the guidelines outlined in the HET Vision Action Plan (USFWS 1993), must be completed and undergo a peer review prior to initiation of a study. A study will not begin until the proposal has final approval. Each proposal will contain a timeline for completion of the project and reporting.

Ongoing studies will be reviewed annually. A written report of progress and results to date will be completed by the principal investigator and distributed to HET members. These reports will also be provided to and discussed at an annual meeting of the parties in March and posted on the USFWS website (<http://www.r1.fws.gov/crfpo>). Investigators are encouraged to involve tribal radio and newspaper media and to present their findings at workshops and conferences.

Marking and tagging of hatchery fish may occur to evaluate specific fish culture practices or for hatchery contribution studies. Such studies may be implemented by the USFWS at no expense to the CTWSRO, but only after approval of the HET.

Natural production studies

CTWSRO staff will conduct chinook index area redd counts each September. This data will be used to estimate production and prespawning mortality. Redd count and survival data will be provided to the USFWS in October.

Juvenile production will be estimated by CTWSRO staff through trapping at the mouth of the Warm Springs River. Using mark/recapture and trapping efficiency estimates, tribal staff estimate the number of wild and in some instances hatchery spring chinook salmon leaving the Warm Springs River. CTWSRO staff will provide estimates of hatchery fish leaving the Warm Springs River following fall releases.

Other studies to assess abundance, distribution, life history, movements and ecology of fishes in the Deschutes Basin may be conducted by CTWSRO staff or other agencies under contract or through cooperative agreements with CTWSRO. All studies which include trapping, handling or taking of live fishes, collection and incubation of gametes from fish (wild or hatchery), liberation or removal of live fish from waters on or bordering the Warm Springs Reservation must be approved by the HET and by the Fish and Wildlife Committee prior to implementation. A detailed written project proposal shall be submitted which addresses:

- Purpose of the work
- Project description
- Contact person
- Number, species, methods of take
- Dates, location, personnel, vehicles
- Budget summary and funding source identification
- Documentation of ESA consultation and compliance (non tribal funded projects)
- Completion Date

Investigators may be required to provide progress reports of natural production studies. Ongoing projects will be reviewed annually. A written report of progress and results to date will be completed by the principal investigator and distributed to HET members and the Fish and Wildlife Committee. These reports will also be provided to and discussed at an annual meeting of the parties in March and posted on the USFWS website (<http://www.r1.fws.gov/crfpo>). Investigators

are encouraged to involve tribal radio and newspaper media and to present their findings at workshops and conferences.

Harvest

The CTWSRO will work with the ODFW to monitor the tribal fisheries at Sherars Falls and other locations in the Deschutes drainage to provide harvest estimates. CWT recovery data will be used to provide estimates of hatchery contribution to the fishery (RBH and WSNFH).

Objective 7: Conduct Environmental Monitoring.

Environmental monitoring

Environmental monitoring will be conducted at WSNFH to ensure that this facility meets the requirements of the National Pollution Discharge Elimination Permit. Environmental monitoring will also be used in managing fish health. At a minimum, the following parameters will be monitored at this hatchery:

- Total Suspended Solids (TSS)— Effluent will be sampled once per week during heaviest load months of March, April, September, and October. Influent will be sampled when effluent is out of compliance.
- *Settleable Solids (SS)*— Effluent will be sampled once per week during heaviest load months of March, April, September, and October. Influent will be sampled when effluent is out of compliance.
- *In-hatchery Water Temperatures*—maximum, minimum and average daily.
- *In-hatchery Dissolved Oxygen, Nitrogen, Ammonia, and pH*—as needed by changes in flow or temperature.

Instream monitoring

Once monthly, CTWSRO staff will monitor conductivity, pH, turbidity, and dissolved oxygen at six sites on the mainstem Warm Springs River. Two Isco samplers will also be operated, one at Culpus Bridge and one at HeHe, to provide daily sediment load estimates. Flows will be recorded at Culpus Bridge and HeHe. Temperature will be recorded at a number of sites throughout the mainstem. The CTWSRO will provide this data as requested. The CTWSRO will also monitor stream temperature near the hatchery intake.

Objective 8: Stock the lower Warm Springs River with catchable trout, as requested by CTWSRO.

Originally, WSNFH was expected to provide trout for all programs on the Warm Springs Reservation of Oregon, including Lake Simtustus, and also provide trout for the Umatilla Reservation. Due to disease considerations and changing priorities, the program has been reduced to holding rainbow trout for planting in the Warm Springs River at Kah-Nee-Ta Resort.

At the request of the CTWSRO, WSNFH will arrange for rainbow trout to be delivered to WSNFH for stocking in the Warm Springs River. The CTWSRO will pay for purchase and transport of the fish. WSNFH/USFWS will maintain fish and stock into the Warm Springs River according to a schedule agreed to by the CTWSRO and WSNFH.

Only hatchery rainbow trout of Deschutes River origin which are resistant to the parasite *C. shasta* will be stocked into the Warm Springs River. The CTWSRO and the USFWS will identify appropriate trout for stocking and determine whether or not to externally mark these fish.

Objective 9: Develop and implement projects to improve quality of production at WSNFH.

Constraints to production at Warm Springs National Fish Hatchery

Low survival is caused by several factors, including high summer water temperatures, untreated water, parasite loads, BKD, predation, Columbia River passage problems past The Dalles and Bonneville Dams, poor ocean productivity, and fisheries.

Modifications made (1997-2001)

Shade structures have been constructed over the rearing ponds. These structures will diffuse the direct sunlight on the ponds simulating the natural environment, while allowing access for feeding, pond cleaning, etc.

A self-cleaning water system has been installed on the early rearing tanks to provide a better environment.

Projects to implement/improvements needed

Continue to investigate methods to increase survival while minimizing impacts on wild populations. This may include size and time of release studies, rearing density variations, rearing hatchery fish similar to natural fish, different feed types, and feed methods.

Develop a genetics monitoring program to help maintain the hatchery stock characteristics similar to the wild stock. Develop a Hatchery and Genetic Management Plan (HGMP).

Develop and implement an annual monitoring program to determine number and size of fish released and to evaluate migration timing in the Warm Springs, Deschutes, and Columbia rivers.

Install shade structure and/or sprinklers over the adult separator and adult catch areas to provide protection and relief from the sun for adults passing the facility and being retained at the hatchery.

Develop and implement a plan to significantly improve the juvenile rearing environment. Increase inside rearing space.

Investigate the feasibility of a reuse system including biological filters, ozone disinfection, and chilling during the summer months.

Investigate replacing vertical rearing pond water inlet system with a horizontal style to achieve better pond flow characteristics.

Replace the hatchery water intake structure to meet NMFS Hatchery Biological Opinion criteria.

The HET will identify additional hatchery reform measures and will develop funding proposals as sources are available.

Implement remedial actions recommended by the IHOT audit team that are appropriate for WSNFH (Intake, more inside rearing space).

Refurbish or replace the floating Humphrey Scoop trap used to monitor outmigrants from the Warm Springs River. Relocate trap to a new site with better trapping efficiency.

Design and install an improved coded wire tag detection equipment and gates on the automated volitional passage system to improve sorting efficiency and to reduce unintentional upstream escapement of hatchery adults and jacks .

Investigate and implement techniques to improve retention of fin clips and coded wire tags in hatchery spring chinook. Objective should be minimum 95% and preferably 99+% retention.

Implement studies of ecological interactions between hatchery and wild fish including: winter rearing and migration of fall hatchery releases, behavioral interactions between hatchery and wild juveniles in simulated streams, evaluate relative reproductive success of wild and hatchery chinook spawning together in a natural stream, and monitor habitat utilization of outplanted adult hatchery fish.

Conduct studies to create a more natural-like environment at the hatchery.

Investigate potential for development of facilities for propagation of other indigenous fish species, including sockeye and lamprey, for reintroduction into formerly occupied habitats above Pelton/Round Butte project.

Investigate methods to deter avian predators away from the raceway outlet drain where it enters the Warm Springs River. Hatchery smolts are concentrated at the mouth of the drain during volitional and forced releases. Fish may become disoriented after passing through the drain and vulnerable to predation. Predator deterrence is needed to allow outmigrants time to adjust to the river environment.

Produce Station Development Plans and a Comprehensive Hatchery Management Plan. Assess health and monitor for Whirling Disease in the wild fish of the Warm Springs River and Deschutes Basin.

Predator control

WSNFH staff will notify the CTWSRO fish and wildlife staff as soon as a predation problem is suspected. Each agency will notify appropriate staff and policy level representatives. The Parties will immediately develop appropriate actions to be taken considering all existing Tribal, State, and Federal codes and laws.

Objective 10: Effectively communicate with salmon producers and managers.

Quarterly hatchery evaluation team (HET) and monthly coordination meetings will be held. These meetings will include hatchery, management, fish health and tribal representatives. Cooperators and other interested parties are invited to hear reports on the accomplishments, review plans, and present management programs that might affect, or be affected by hatchery operations. A yearly meeting with all cooperators and policy level personnel will be held in March.

The CTWSRO and USFWS each have representatives on the Artificial Production Advisory Committee (APAC). Each agency will review operating procedures at WSNFH with these representatives to ensure compliance with APAC's policies and procedures for Columbia Basin anadromous salmonid hatcheries.

The CTWSRO and the USFWS each have representatives on the Production Advisory Committee (PAC). Each agency will review production numbers in this plan to ensure compliance with the US v. Oregon production agreements.

ODFW, Portland General Electric (PGE), CTWSRO, Bonneville Power Administration (BPA) and USFWS will participate in annual production coordination meetings for operation of the Round Butte Fish Hatchery.

Record keeping

Records will be kept to comply with IHOT standards. Fish rearing records will be updated monthly and be available upon request.

WSNFH staff will keep accurate records of returns to the hatchery on a standard data form approved by HET. Fish will be examined closely for the presence/absence of marks and tags. Tag numbers will be recorded and reported to appropriate agencies.

Data reporting

WSNFH records and reports data using the Columbia River Information System of the USFWS. WSNFH will make every attempt to provide the CTWSRO with trap and video counts every Tuesday and Friday during the spring chinook salmon migration (April 16 through September 30). Counts of steelhead and other species will be provided monthly. Egg and run summaries will also be provided to the CTWSRO. Prior to release of adult chinook salmon and steelhead return data outside the USFWS, the information will be provided to and reviewed by CTWSRO staff. CTWSRO staff will review data and provide comments within one week of receiving data. Data will not be released until the USFWS has confirmed the data with the CTWSRO. The USFWS will only release accurate and up to date information. The hatchery production data is a responsibility of the USFWS.

A summary of data reports will be provided at regularly scheduled HET meetings, the annual meeting, and at the Round Butte hatchery coordination meeting. Prior to making presentations at outside workshops and conferences, the HET members will present their findings to the HET, Tribe and USFWS as requested.

Data requests

Parties to this plan agree to provide requested data in a timely matter.

ESA - SECTION 7 CONSULTATION

The USFWS will coordinate and write applicable Hatchery and Genetic Management Plans (HGMP's) and biological assessments (BA's) for WSNFH. These documents will have tribal review prior to submission to NMFS and USFWS record.

DISPUTE RESOLUTION PROCESS

All Parties to this operational plan agree to make a good faith effort to resolve disagreements on all issues. On issues for which the Parties are unable to reach consensus, the technical representatives will submit in writing a statement in support of their position on the disputed issue to appropriate executive management level representatives. A meeting will be convened at this level to resolve the issue. Issues not resolved at this level shall be submitted in writing to a policy level forum with appropriate technical, executive, policy and/or legal analysis and recommendations.

AGENCY RESPONSIBILITIES

The USFWS is responsible for operation and management of WSNFH. Nothing in this agreement is intended to alter, amend, modify, or abridge any sovereign responsibilities of the United States or intended to impose a legal obligation on the USFWS that conflicts with applicable federal laws, regulations, procedures and policies. The USFWS will operate the facility in accordance with IHOT or other mutually acceptable standards. The Columbia River Fisheries Program Office will provide management assistance to WSNFH staff, CTWSRO, and regional fisheries programs. USFWS Employees will comply with all applicable codes, laws, and policies, i.e. water and wildlife codes.

The Parties have the responsibility of ensuring that WSNFH is operated to produce fish for harvest while minimizing negative effects on indigenous populations. The Parties will ensure that the hatchery is operated within CTWSRO fishery management guidelines and within Tribal codes, laws, and policies to the extent that they do not conflict with Federal laws, codes, or policies. The Parties also have the responsibility of ensuring that the facility is operated in an efficient matter, considering the effects of operations on the biological world around the facility.

TIME SPAN

This operational plan will be in effect from the time of signing until December 31, 2006. At that time, a new agreement will be established for future years. Alterations to this plan shall have the mutual agreement of both parties.

ANTICIPATED TIMELINE FOR MEETINGS AND TASK COMPLETION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HET												
Coordination Meetings												
Annual Meeting												
Run Prediction Completed												
Studies Reports Distributed												
Redd Counts												
Redd Count Data Reported												
Rainbow stocking												
Fish Counts Reported												
Fish Passage System Operated												
Broodstock Collection												
Hatchery Adult Spawning												
Juvenile/Smolt Releases												

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SIGNATURES

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Assistant Regional Director
Fishery Resources
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Region 1
Portland, Oregon

March 27, 2002
Date

Cheryl Patt, Jr.
Tribal Council Chairman
The Confederated Tribes of the
Warm Springs Reservation of Oregon
Warm Springs, Oregon

March 27, 2002
Date

Edmund Scott P.
Chairman, On-Reservation Fish and Wildlife Committee
The Confederated Tribes of the
Warm Springs Reservation of Oregon
Warm Springs, Oregon

3-27-02
Date

Zerry Courtney
Chairman, Off Reservation Fish and Wildlife Committee
The Confederated Tribes of the
Warm Springs Reservation of Oregon
Warm Springs, Oregon

3.27.02
Date

Tim A. Luther ACTING
Natural Resources General Manager
The Confederated Tribes of the
Warm Springs Reservation of Oregon
Warm Springs, Oregon

3/27/02
Date