

SOUTH SANTIAM HATCHERY



PROGRAM MANAGEMENT PLAN 2023

South Santiam Hatchery/Foster Adult Collection Facility

INTRODUCTION

South Santiam Hatchery is located on the South Santiam River just downstream from Foster Dam, 5 miles east of downtown Sweet Home. The facility is at an elevation of 500 feet above sea level, at latitude 44.4158 and longitude -122.6725. The site area is 12.6 acres, owned by the US Army Corps of Engineers and is used for egg incubation and juvenile rearing.

The hatchery currently receives water from Foster Reservoir. A total of 8,400 gpm is available for the rearing units. An additional 5,500 gpm is used in the large rearing pond. All rearing ponds receive single-pass water. ODFW has no water right for water from Foster Reservoir, although it does state in the Cooperative agreement between the USACE and ODFW that the USACE will provide adequate water to operate the facility.

The Foster Dam Adult Collection Facility was completed in July of 2014 which eliminated the need to transport adults to and hold brood stock at South Santiam Hatchery. ODFW took over operations of the facility in April of 2014. The new facility consists of an office/maintenance building, pre-sort pool, fish sorting area, 5 long term post-sort pools, 4 short term post-sort pools, and a water-to-water fish-to-truck loading system. Adult fish collection, adult handling, out planting, recycling, spawning, carcass processing, and brood stock holding will take place at Foster. The Foster Dam Adult Collection Facility is located about 2 miles east of Sweet Home, Oregon at the base of Foster Dam along the south shore of the South Santiam River at RM 37.3, directly across from the hatchery.

The facility is staffed with 4.3 FTE's.

Rearing Facilities at South Santiam Hatchery

Unit Type	Unit Length (ft)	Unit Width (ft)	Unit Depth (ft)	Unit Volume (ft ³)	Number Units	Total Volume (ft ³)	Construction Material	Age	Condition	Comment
Large Rearing Pond	147	47	6.7	26,595	1	26,595	concrete	1969	fair	Showing signs of erosion and in need of repair.
Burroughs Raceways	75	17	4	4,147	10	41,470	concrete	1969	good	Starting to show signs of erosion.
Burroughs Raceways	75	20.5	4	5,022	4	20,088	concrete	1985	good	Starting to show signs of erosion.
Vertical Incubators					480		fiberglass		good	
Starter Troughs	14	3	3	126	3	378	fiberglass	2011	new	
Starter Troughs	20	4	4	320	2	640	fiberglass	2005	good	

PURPOSE

South Santiam Hatchery began operation at its present location in 1968. It is funded by both the state of Oregon and the U.S. Army Corps of Engineers (USACE). The USACE's obligation is to mitigate for fishery losses caused by development of Foster and Green Peter dams. The hatchery is used for adult collection, egg incubation and rearing of spring chinook and summer steelhead.

PROGRAM TYPE

The ODFW Hatchery Management Policy defines hatchery programs as either harvest or conservation programs. Harvest programs operate to enhance or maintain fisheries without impairing naturally reproducing populations. Conservation programs operate to maintain or increase the number of naturally produced fish without reducing the productivity of naturally reproducing populations.

South Santiam Hatchery programs are harvest programs, used to mitigate loss of fishing and harvest opportunities due to loss of habitat and migration blockage resulting from the construction of dams in the Santiam River system.

GOALS

South Santiam River (24H) Spring Chinook: This is a mitigation program with the following goals:

- Mitigate the loss of spring chinook catch in sport and commercial fisheries resulting from the construction and operation of Foster and Green Peter dams (IHOT, 1999);
- Provide adequate adult returns to the hatchery for broodstock to meet program goals as outlined in the Santiam River Subbasin Fish Management Plan (OAR 635-500-1666); and
- Maintain suitable broodstock for ongoing and future population recovery efforts throughout the subbasin.

South Santiam River (24H) Steelhead: This is a mitigation program with the following goals:

- Mitigate the loss of steelhead catch in sport fisheries resulting from the construction and operation of Foster and Green Peter dams (IHOT, 1999);
- Provide adequate adult returns to the hatchery for broodstock to meet program goals as outlined in the Santiam River Subbasin Fish Management Plan (OAR 635-500-1500); and
- Minimize the potential impact of summer steelhead on native winter steelhead and trout.

OBJECTIVES

Objective 1: Foster and sustain opportunities for sport, commercial, and tribal fishers consistent with the conservation of naturally produced native fish.

Spring Chinook:

South Santiam River (24H) Stock:

Provide 1,200,000 eyed eggs to Willamette Hatchery.

Provide 975,000 eyed eggs to Gnat Creek Hatchery.

Provide 1,600,000 eyed eggs to Oxbow Hatchery.

Provide 20,000 eggs to Oregon's Salmon and Trout Enhancement Program (STEP).

Produce 1,020,000 smolts (117,500 pounds) for release into the South Santiam River.

Summer Steelhead:

South Santiam River (24H) Stock:

Provide 645,000 eyed eggs to Willamette and Bonneville hatcheries.

Produce 121,000 smolts (26,667 pounds) for release into the South Santiam River.

Produce 125,000 fingerlings (1,786 pounds) for transfer to Leaburg Hatchery.

- Objective 2: Contribute toward the sustainability of naturally produced native fish populations through the responsible use of hatcheries and hatchery-produced fish.
- Objective 3: Maintain genetic resources of native fish populations spawned or reared in captivity.
- Objective 4: Restrict the introduction, amplification, or dissemination of disease agents in hatchery produced fish and in natural environments by controlling egg and fish movements and by prescribing a variety of preventative, therapeutic and disinfecting strategies to control the spread of disease agents in fish populations in the state.
- Objective 5: Minimize adverse ecological impacts to watersheds caused by hatchery facilities and operations.
- Objective 6: Communicate effectively with other fish producers, managers and the public.

CURRENT PRACTICES TO ACHIEVE OBJECTIVES

The sections that follow describe the current hatchery practices associated with anadromous fish production at this facility. Because ODFW hatcheries are managed to maximize use of the hatchery rearing space, hatchery operations are dynamic and subject to annual change depending upon statewide program needs.

The Native Fish Conservation Policy, the Fish Hatchery Management Policy, the Fish Health Management Policy and Hatchery Genetic Management Plans provide guidelines for the management of wild and hatchery fish in Oregon. These policies describe the brood collection, rearing, release, and health management strategies currently used at this facility.

Objective 1: Foster and sustain opportunities for sport, commercial, and tribal fishers consistent with the conservation of naturally produced native fish.

Adult Collection

Spring Chinook:

South Santiam River (24H) Stock: Adult spring chinook return to the South Santiam River from May to September. Adults are collected at the Foster Dam fish collection facility located across the river from the hatchery. The annual adult collection goal is 269 pairs. An additional 700 pairs are collected for the Oxbow and Gnat Creek Hatcheries production. In the past, unclipped, and clipped fish were transported above Foster Dam for out planting into the South Fork of the Santiam River. Starting in 2009 to present, only unclipped adults are used for out planting above Foster. Additional clipped adults can be used for out plantings to other streams in the Santiam drainage. Broodstock are held in long-term holding ponds at the FAFF.

Summer Steelhead:

South Santiam River (24H) Stock: Adults return to the South Santiam River from April to November. Adults are collected at the Foster Dam fish collection facility and are held in long term holding pools until spawning from May through February.

Winter Steelhead:

South Santiam River (24W) Stock: Adults return to the South Santiam River from November through June. Adults are collected at Foster Dam fish collection facility and transported upstream to be released into the South Fork of the Santiam River to continue their migration and natural spawning.

Objective 2: Contribute toward the sustainability of naturally produced native fish populations through the responsible use of hatcheries and hatchery-produced fish.

Rearing and Release Strategies

Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size that smoltification occurs within nearly the entire population, which will reduce the retention time in downstream migration. Rearing on parent river water, or acclimation to parent river water for several weeks, is used to ensure strong homing to the hatchery, thus reducing the stray rate to natural populations. Various release strategies are used to ensure that fish migrate from the hatchery with least amount of interaction with native populations. The specific rearing and release strategies used at this hatchery are outlined below.

Spring Chinook:

South Santiam River (24H) Stock:

Receive 610,000 fingerlings at a size of 150 fpp from Willamette hatchery in late May.

Receive 130,000 fingerlings at a size of 75 fpp from Willamette hatchery in late May.

Receive 300,000 smolts at a size of 13 fpp from Willamette hatchery in late May.

Rear 300,000 smolts to a size of 9 fpp for on-station release in late October/early November. All fish are fin-clipped and otolith-marked and 50,000 are also coded-wire tagged.

Rear 720,000 smolts to a size of 8-10 fpp for on-station release in February thru mid-March. All fish are fin-clipped and otolith-marked and 180,000 are also coded-wire tagged prior to release.

Summer Steelhead:

South Santiam River (24H) Stock:

Rear 125,000 fingerlings to a size of 70 fpp for transfer to Leaburg Hatchery in mid-July. All fish are fin-clipped prior to transfer.

Rear 121,000 smolts to a size of 4.5 fpp for on-station release into the South Santiam River in early April. All fish are fin-clipped prior to release.

Rear 121,000 smolts to a size of 4.5 fpp for transfer to Minto in March. All fish are fin-clipped prior to transfer.

Objective 3: Maintain genetic resources of native fish populations spawned or reared in captivity.

Broodstock Selection and Spawning

Oregon's Native Fish Conservation Policy and Hatchery Genetic and Management Plans outline broodstock selection and spawning protocols for some fish stocks. The following practices are currently being used at South Santiam Hatchery:

Spring Chinook:

South Santiam River (24H) Stock: Broodstock is comprised entirely of hatchery fish. Adults are collected throughout the run, and spawned at a 1:1 male to female ratio.

Summer Steelhead:

South Santiam River (24H) Stock: Broodstock is comprised of entirely hatchery origin fish that originated from Skamania stock. More adults return to the trapping facility than are needed for hatchery production. None are passed above Foster Dam. Adults are spawned at a 1:1 male to female ratio. Any Skamania stock is acceptable for broodstock use, but Santiam stock is preferred.

Objective 4: Restrict the introduction, amplification, or dissemination of disease agents in hatchery produced fish and in natural environments by controlling egg and fish movements and by prescribing a variety of preventative, therapeutic and disinfecting strategies to control the spread of disease agents in fish populations in the state.

Fish Health Management Programs--All Stocks

ODFW has adopted a Fish Health Management Policy that describes measures that minimize the impact of fish diseases on the state's fish resources. The primary objective of fish health management programs at ODFW hatcheries is to produce healthy smolts that will contribute to the fishery and return sufficient numbers of adults to continue propagation of the stocks and provide supplementation if desired. Equally important is to prevent the introduction, amplification or spread of fish pathogens that might negatively affect the health of both hatchery and naturally reproducing stocks.

ODFW has implemented both disease control and disease prevention programs at all of its facilities to achieve these objectives. These programs include the following standard elements:

Disease Control (Reactive)

- Perform necropsies of diseased and dead fish to diagnose the cause of loss.
- Prescribe appropriate treatments and remedies to disease. This includes recommending modifications in fish culture practices, when appropriate, to alleviate disease-contributing factors.
- Apply a disease control policy as stated in the Oregon Administrative Rules which dictates how specific disease problems will be addressed and what restrictions may be placed on movements of diseased stocks.
- Conduct applied research on new and existing techniques to control disease epizootics.

Disease Prevention (Proactive)

- Routinely remove dead fish from each rearing container and notify ODFW Fish Pathology if losses are increasing. Monthly mortality records are submitted to Fish Pathology from each hatchery.
- Routinely perform examinations of live fish to assess health status and detect problems before they progress to clinical disease or mortality.
- Implement disease preventative strategies in all aspects of fish culture to produce a quality fish. This includes prescribing the optimal nutritional needs and environmental conditions in the hatchery rearing container based on historical disease events. It also involves the use of vaccines or antibiotics in order to avoid a disease problem.
- Use a disease prevention policy that restricts the introduction of stocks into a facility. This will help avoid new disease problems and fish pathogens not previously found at the site.
- Use sanitation procedures that prevent introduction of pathogens into and/or within a facility.
- Conduct applied research on new and existing disease prevention techniques.
- Utilize pond management strategies (e.g., Density Index and Flow Index guidelines) to help optimize the quality of the aquatic environment and minimize fish stress that can be conducive to infectious and noninfectious diseases. For example, a Density Index is used to estimate the maximum number of fish that can occupy a rearing unit based on the rearing unit's size. A Flow Index is used to estimate the rearing unit's carrying capacity based on water flows.

Fish Health Activities at South Santiam Hatchery

Health Monitoring

- All fish are given a health inspection no longer than 6 weeks before fish are released or transferred. This exam may be in conjunction with the routine monthly visit.
- Monthly health monitoring examinations of healthy and clinically diseased fish are conducted on each fish lot. The sample includes a minimum of 10 moribund/dead fish (if available) and 4-6 live fish per lot.
- Examinations for *Myxobolus cerebralis*, agent of whirling disease, are conducted annually on 60 fish held for a minimum of 180 days at the facility.
- At spawning, a minimum of 60 ovarian fluids and 60 kidney/spleen/pyloric caeca (based on a minimum sampling at the 5% incidence level) are examined for viral pathogens from each salmon lot. In addition all Spring Chinook salmon females are sampled for BKD levels so positive eggs maybe culled from the egg take. All Summer Steelhead females and males spawned are sampled for viral pathogens. If pre-spawning mortality is above normal, necropsies are conducted on dead adult fish for bacteria, parasites and other causes of death.
- Whenever abnormal behavior is reported or observed, or mortality exceeds 0.1% per day over five consecutive days in any rearing container, the fish pathologist will examine the affected fish, make a diagnosis and recommend the appropriate remedial or preventative measures.
- Reporting and control of specific fish pathogens are conducted in accordance with the Fish Health Management Policy. Results from each examination mentioned above are reported on the ODFW Fish Health or Virus Examination forms.

Fish and Egg Movements

- Movements of fish and eggs are conducted in accordance with the Fish Health Management Policy.

Therapeutic and Prophylactic Treatments

- Adult spring chinook and summer steelhead are injected with antibiotics for the control of bacterial diseases. These fish are treated weekly with hydrogen peroxide for the control of fungus.
- At spawning, eggs are water-hardened in iodophor for disinfection.
- Juvenile fish are administered antibiotics orally as needed for the control of bacterial infections and for prevention of diseases.
- Hydrogen Peroxide or formalin is dispensed into water for control of parasites and fungus on eggs and juveniles. Treatment dosage and exposure time varies with species, life stage and condition being treated.
- Only approved or permitted therapeutic agents are used for treatments:
 - FDA labeled and approved for use on food fish
 - Allowed by the FDA as an Investigational New Animal Drug
 - Obtained by extra-label prescription from a veterinarian
 - Allowed by the FDA as low regulatory priority or deferred regulatory status
 - Approved by the FDA through USFWS for fish listed under the federal Endangered Species Act.

Sanitation

- All eggs brought to the facility are surface-disinfected or water-hardened in buffered iodophor.
- Disinfection footbaths (or other means of disinfection) are provided at the incubation facility's entrance and exit areas while embryos are incubating in the facility.
- All equipment (e.g., nets, tanks, rain gear, boots) is disinfected with iodophor between uses with different fish/egg lots or different rearing containers.
- Dead fish are disposed of promptly and in a manner that prevents introduction of disease agents to the waters of the state.
- Rearing units are cleaned on a regular basis.
- Fish transport trucks are disinfected between the hauling of different fish lots.
- Rearing units are sanitized after removing fish and before introducing a new fish stock either by thorough cleaning and use of a disinfectant or by cleaning and leaving dry for an extended time.

Objective 5: Minimize adverse ecological impacts to watersheds caused by hatchery facilities and operations.

Environmental Monitoring

Primarily, environmental monitoring is conducted at ODFW facilities to ensure these facilities meet the requirements of the National Pollution Discharge Elimination Permit administered by the Oregon

Department of Environmental Quality. It 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 to quantify water quality impacts resulting from changes in the watershed (e.g., logging, road building and urbanization). The following environmental parameters are currently monitored at all ODFW hatcheries:

- Total Suspended Solids (TSS) – measured quarterly. Two composite samples are collected, one during normal operations and one during cleaning. Some facilities may take more samples because of multiple outfalls.
- Settleable Solids (SS) – measured quarterly. Two composite samples are collected, one during normal operations and one during cleaning. Some facilities may take more samples because of multiple outfalls.
- pH – measured quarterly when settleable solids are measured.
- Total Ammonia and Total Phosphorus – measured quarterly during the first 12 months of the permit when settleable solids are measured.
- Water Temperatures – daily maximum and minimum water temperatures are measured within the hatchery. Temperature units are recorded for egg development in some hatcheries. Effluent and receiving stream temperatures are measured weekly from April to October.
- Dissolved Oxygen (DO) – measured only when conditions warrant (e.g., periods of low flows and high temperatures).
- Air Temperatures – maximum and minimum temperatures are recorded daily at some stations, but there are no special monitoring requirements.
- Flow Logs – changes in water flows through the hatchery ponds are recorded weekly.

Objective 6: Communicate effectively with other fish producers, managers and the public.

Coordination/Communication within ODFW

Annual Fish Production Meetings: ODFW conducts meetings throughout the state to set annual fish production goals for all public hatcheries in Oregon. These meetings involve the participation of ODFW research, management and fish culture staff as well as representatives from applicable federal agencies and tribes.

Record Keeping: The following records are kept at all ODFW hatcheries:

- Anadromous Adult Transaction Report – details the collection and disposition of all adult fish handled at the facility.
- Mark Recovery Report – details sex, fish length and tag information from all marked adult fish that are captured.
- Egg and Fry Report – records all egg and fry movements, treatments, etc.
- Monthly Poned Report – updates hatchery operations from the previous month (i.e., current number of fish, size, transfers or releases, feed conversion, mortality, medication, etc.).
- Monthly Progress Report – document summarizing operational activities for the hatchery and all satellite facilities (e.g., fish culture, fish health, fish distribution, maintenance and safety).

- Fish Loss and Treatment Report – records disease problems and daily mortality.
- Fish Loss Report/Investigation – when 1,000 or more juveniles or 10 or more adult fish are accidentally lost in a single accident.
- Predator Mortality Report – documents any fish predators that may die at the hatchery facility.
- Fish Liberation Reports – details information regarding all fish releases (e.g., fish numbers, size, location, method of release, marks, etc.).
- Coded–Wire Tag Release Reports – record of all juvenile fish released with coded-wire tags.
- Length Frequency Record – details fish lengths of all anadromous fish released (based on a sample of the releases).
- Chemical use, waste discharge monitoring, purchasing, budget, hazardous materials, safety, vehicles, equipment, maintenance and alarm logs.
- Visitor Log – some facilities record the daily visitor use of the facility; however, this is not a requirement.

Hatchery Management System (HMS): Computerized system to collect, report, summarize and analyze hatchery production data. This system is a tool to be used in production control at all hatchery management levels.

Coordinated Information System (CIS): Future record keeping will be coordinated with the basin-wide Coordinated Information System (CIS) currently under development. The CIS development is being funded by Bonneville Power Administration. It will be a system to access all necessary databases in the region. It is hoped that coordinated information collection and reporting will result in consistency between the various agencies.

Interagency Coordination/Communication

Production Advisory Committee (PAC): The Columbia River PAC is comprised of representatives from the regulatory management agencies and tribes. This group meets monthly to discuss anadromous fish production issues and to provide an opportunity for communication among the anadromous fish hatchery managers.

Technical Advisory Committee (TAC): The Columbia River TAC is comprised of regulatory fish harvest technicians. This group provides management direction used in establishing hatchery fish production goals. TAC meets monthly.

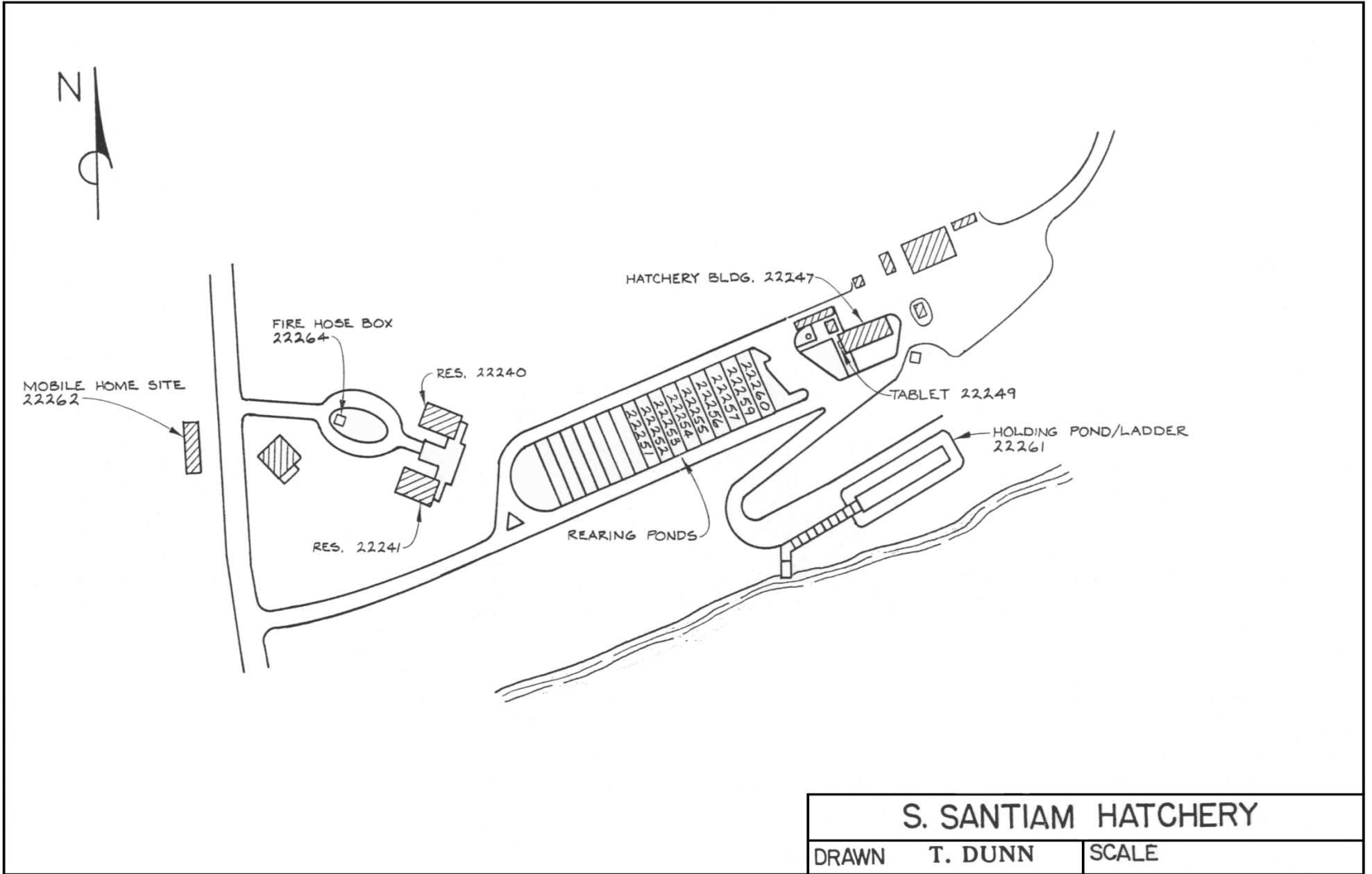
Pacific Northwest Fish Health Protection Committee (PNFHPC): This group is comprised of representatives from U.S. and Canadian fish management agencies, tribes, universities, and private fish operations. The groups meets twice a year to monitor regional fish health policies and to discuss current fish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

In-River Agreements: State and tribal representatives meet annually to set Columbia River harvests as part of the *U.S. v. Oregon Agreement*. Periodic meetings are also held throughout the year to assess if targets are being met.

In-Season Communications: Communication with PAC, the Columbia River Inter-Tribal Fish Commission, Washington Department of Wildlife, Washington Department of Fisheries, U.S. Fish and Wildlife Service and Idaho Department of Fish and Game takes place each year to coordinate proper fish and egg transfers in an effort to meet basin-wide goals at all facilities, where applicable.

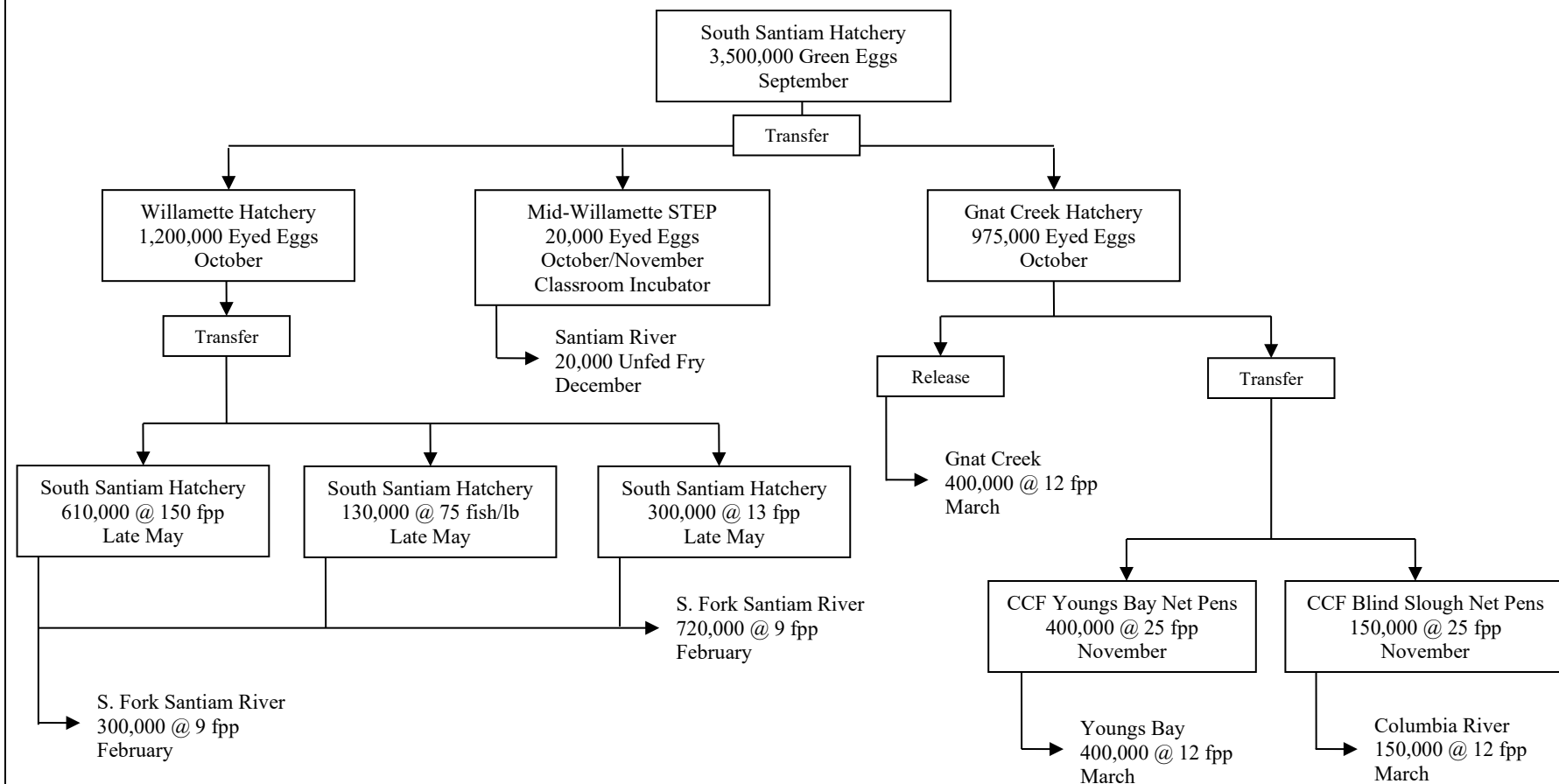
Communication with the General Public

South Santiam Hatchery receives approximately 8,000 visitors per year.



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South Santiam Hatchery Spring Chinook Salmon – Stock 24H (South Santiam River)



South Santiam Hatchery Summer Steelhead – Stock 24H (South Santiam River)

