

CASCADE HATCHERY



PROGRAM MANAGEMENT PLAN 2017

Cascade Hatchery

INTRODUCTION

Cascade Hatchery is located along Eagle Creek, 2.5 miles west of Cascade Locks, Oregon, off of Interstate 84 (Exit 41). The site is located at an elevation of 100 feet above sea level, at latitude 45° 38' 30" N (45.64167) and longitude 121° 55' 33" W (121.9258). The area of the site is 3.8 acres, owned by US Forest Service, Mt. Hood National Forest District.

Water is supplied by gravity flow from Eagle Creek. The total water right is 20,205 gpm.

The hatchery is staffed with 5.0 FTE's.

Rearing Facilities at Cascade 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
Adult Holding Pond	210	35	4	22,050	1	22,050	concrete	1960	fair	Very irregular shape
Raceways	78	16	2.5	3,120	30	93,600	concrete	1960	fair	
Deep Troughs	16	1.42	1.25	28	5	140	Fiberglass	1985	good	Not used for incubation
Vertical Incubators					990			Various	fair	66 stacks of 15 trays

PURPOSE

Cascade Hatchery was authorized under the Mitchell Act and began operating in 1959 as part of the Columbia River Fisheries Development Program – a program to enhance declining fish runs in the Columbia River Basin. The facility is used for egg incubation and rearing of Coho.

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.

Cascade Hatchery participates in both harvest and conservation programs. The Tanner Creek (014) Coho program and the Sandy River (011) spring Chinook program are harvest programs used to mitigate for the loss of fishing and harvest opportunities due to habitat loss and migration blockage resulting from the Columbia Basin hydropower system. The Mid-Columbia/Leavenworth (508)

Coho program and the Umatilla River (091) Coho Program are conservation programs for the restoration of extirpated populations.

GOALS

Big Creek (13H) Coho: Produce lower Columbia Coho that will contribute to NE Pacific and Columbia River Basin commercial and sport fisheries.

Tanner Creek (14H) Coho: Produce fish to help meet the goals of the Columbia River Fish Management Plan (*U.S. v. Oregon Agreement*).

Umatilla River (91H) Coho: Produce fish from a locally-adapted broodstock for a restoration program to reintroduce coho into the Umatilla River Basin and establish ocean and in-river harvest opportunities.

Nez Perce (85H) Coho: Produce fish to release into the Lostine River Basin.

Mid-Columbia/Leavenworth (508H) Coho: Produce fish for a restoration program to reintroduce coho into the Wenatchee River Basin.

Sandy River (11H) Spring Chinook: Mitigate for the loss of spring Chinook catch in sport and commercial fisheries that was lost due to habitat degradation and passage impairment resulting from City of Portland construction and operation of dams on the Bull Run River.

OBJECTIVES

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

Coho:

Tanner Creek (14H) Stock:

Produce 883,000 fingerlings (6,689 pounds) for transfer to Upper Herman Creek Ponds (Oxbow Hatchery).

Produce 500,000 fingerlings (3,788 pounds) for transfer to Lower Herman Creek Ponds (Oxbow Hatchery).

Produce 600,000 fry (500 pounds) and 230,000 fingerlings (1,742 pounds) for transfer to Bonneville Hatchery.

Produce 500,000 smolts (31,250 pounds) for transfer to the Nez Perce Tribe (eggs for this production may be received from the Nez Perce Tribe).

Umatilla River (91H) Stock:

Produce 500,000 smolts (33,333 pounds) for acclimation and release into the Umatilla River System.

Mid-Columbia/Leavenworth (508H) Stock:

Produce 390,000 smolts (19,500 pounds) for release into the Wenatchee River System.

Produce 310,000 smolts (12,100 pounds) for transfer to Leavenworth National Fish Hatchery.

Spring Chinook (11H) Stock:

Produce 132,500 smolts (7,361 pounds) for transfer to Sandy 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 used 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

Coho:

Tanner Creek (14H) Stock: Adult coho (Eagle Creek/Tanner Creek stock) return to Eagle Creek from late September to mid-November. Spawning occurs in October and November with a peak in November. No adult fish are collected at the hatchery. All adult fish are

collected and spawned at Bonneville Hatchery. There is some adult salmon escapement above the hatchery.

Umatilla River (91H) Stock: Adults are collected and held at Three Mile Falls Dam; see the Umatilla Hatchery plan for details.

Mid-Columbia/Leavenworth (508H) Stock: No adults are collected at the hatchery; eggs are received from Leavenworth Nation Fish Hatchery in December.

Spring Chinook:

Sandy River (11H) Stock: No adult fish are collected at Cascade Hatchery; see the Clackamas Hatchery Plan for details. Fingerlings are received from Oxbow Hatchery in July.

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.

Coho:

Tanner Creek (14) Stock:

Rear 882,000 fingerlings to a size of 132 fish/pound for transfer to Upper Herman Creek in late June – early July. All fish are adipose-clipped and 50,000 are coded-wire tagged prior to transfer.

Rear 500,000 fingerlings to a size of 132 fish/pound for transfer to Lower Herman Creek in late June. All fish are adipose-clipped and 30,000 are coded-wire tagged prior to transfer.

Produce 600,000 unfed fry at a size of 1,200 fish/pound for transfer to Bonneville Hatchery in February.

Rear 230,000 fingerlings to a size of 132 fish/pound for transfer to Bonneville Hatchery in June. All fish are adipose-clipped and 25,000 are coded-wire tagged prior to transfer.

Rear 500,000 smolts to a size of 18 fish/pound for the Lostine River for the Nez Perce Tribe. All fish are adipose-clipped and 60,000 are coded-wire tagged prior to transfer.

Umatilla River (91H) Stock:

Rear 500,000 smolts to a size of 15 fish/pound for transfer to Umatilla Acclimation site in mid-March for acclimation and release into the Umatilla River. 400,000 fish are fin-clipped and the remaining 100,000 fish are coded-wire tagged prior to transfer.

Mid-Columbia/Leavenworth (508H) Stock:

These programs change each year as the needs are reassessed.

Rear 70,000 fingerlings to 28 fish/pound for transfer to Leavenworth NFH in October for acclimation and release. These coho are now parental based marked.

Rear 240,000 fingerlings to 25 fish/pound for transfer to Leavenworth NFH in November for acclimation and release. These coho are now parental based marked.

Rear 390,000 fingerlings to 20 fish/pound for transfer Wenatchee Basin acclimation sites in March for acclimation and release. These coho are now parental based marked.

Spring Chinook:

Sandy River (11H) Stock:

Receive 133,000 fingerlings from Oxbow Hatchery at a size of 80 fish/pound in mid-July and rear to a size of 18 fish/pound for transfer to Sandy Hatchery in October. All fish are adipose-clipped and coded-wire tagged prior to transfer.

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

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

Broodstock Selection and Spawning

Coho:

Tanner Creek (14H) Stock: Adult collection and spawning take place at Bonneville Hatchery; see the Bonneville Hatchery Plan for details.

Lostine (85H) Stock: Adult collection and spawning is conducted in Idaho by Nez Perce Tribe staff.

Umatilla River (91H) Stock: Adult collection and spawning take place at Three Mile Falls Dam; see the Umatilla Hatchery plan for details. Tanner Creek (014) stock will be used as a backup source of eggs for this program.

Mid-Columbia/Leavenworth (508H) Stock: Eggs are received from Leavenworth National Fish Hatchery.

Spring Chinook:

Sandy River (11H) Stock: Adult collection takes place on the Sandy River and spawning takes place at Clackamas Hatchery; see the Clackamas Hatchery Plan for details.

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 Cascade Hatchery

Health Monitoring

- Monthly health monitoring examinations of healthy and clinically diseased fish are conducted on each fish lot at the hatchery. The sample includes a minimum of 10 moribund/dead fish (if available) and 4-6 live fish per lot.
- 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.
- 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. If pre-spawning mortality is above normal, necropsies are conducted on dead adult fish for bacteria, parasites and other causes of death.
- At spawning, all females are tested for the presence of bacterial kidney disease (BKD). Eggs from positive females may be culled and destroyed, depending on the levels of BKD present and the availability of eggs to meet production needs.

- 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

- At spawning, eggs are water-hardened in iodophor for disinfection.
- Eggs from BKD-positive females are culled and destroyed.
- Juvenile fish are administered antibiotics orally as needed for the control of bacterial infections and for prevention of diseases.
- Formalin and/or Hydrogen Peroxide are 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 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.
- Different lots of fish/eggs are physically segregated from each other by using separate ponds and incubator units.

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 grab 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.
- Water Temperatures – daily maximum and minimum water temperatures are measured within the hatchery. Temperature units are recorded for egg development in some hatcheries.

- 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.

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.

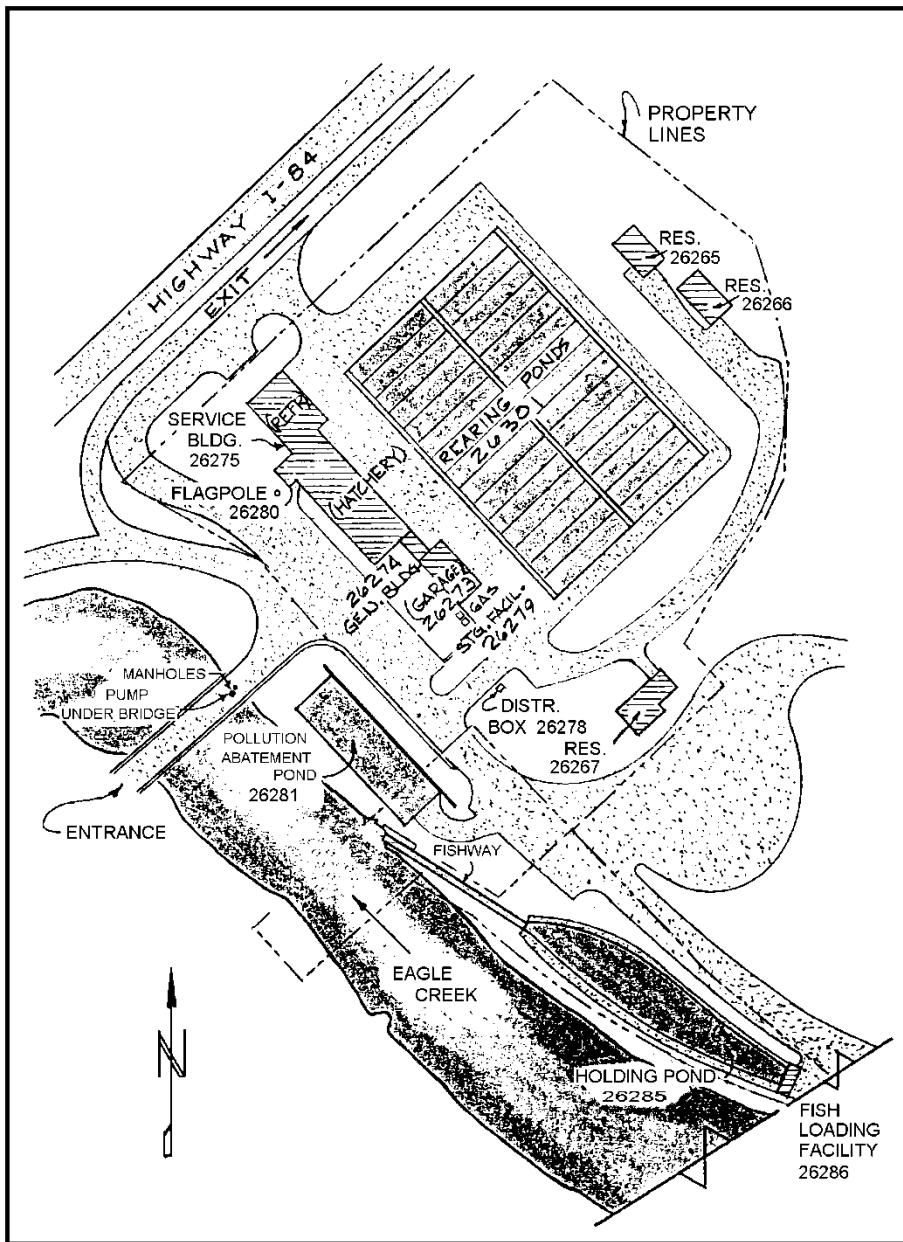
In-River Agreements: State and tribal representatives meet annually to set Columbia River harvests as part of the *U.S. v. Oregon Agreement*. Periodic meetings are also held throughout the year to assess if targets are being met.

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.

Streamnet (www/streamnet.org)): Hatchery return data are input into StreamNet, a cooperative information management and data dissemination project focused on fisheries and aquatic related data and data related services in the Columbia River basin and the Pacific Northwest. StreamNet is funded through the Northwest Power and Conservation Council's Fish and Wildlife Program by the Bonneville Power Administration and are administered by the Pacific States Marine Fisheries Commission. The data are maintained and disseminated through the Pacific States Marine Fisheries Commission (PSMFC).

Communication with the General Public

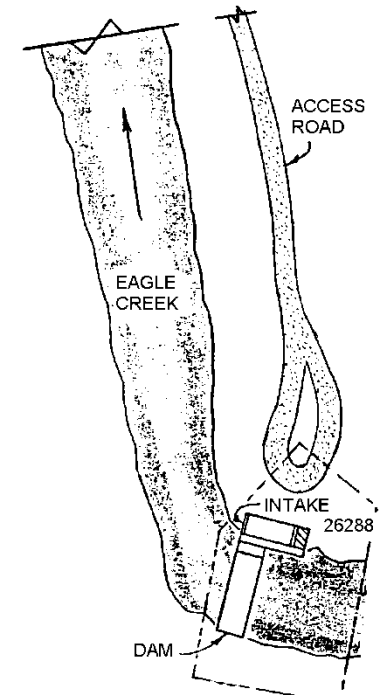
Cascade Hatchery receives approximately 5,000 visitors per year.



11,500 GAL. WATER STORAGE TANK
 26289



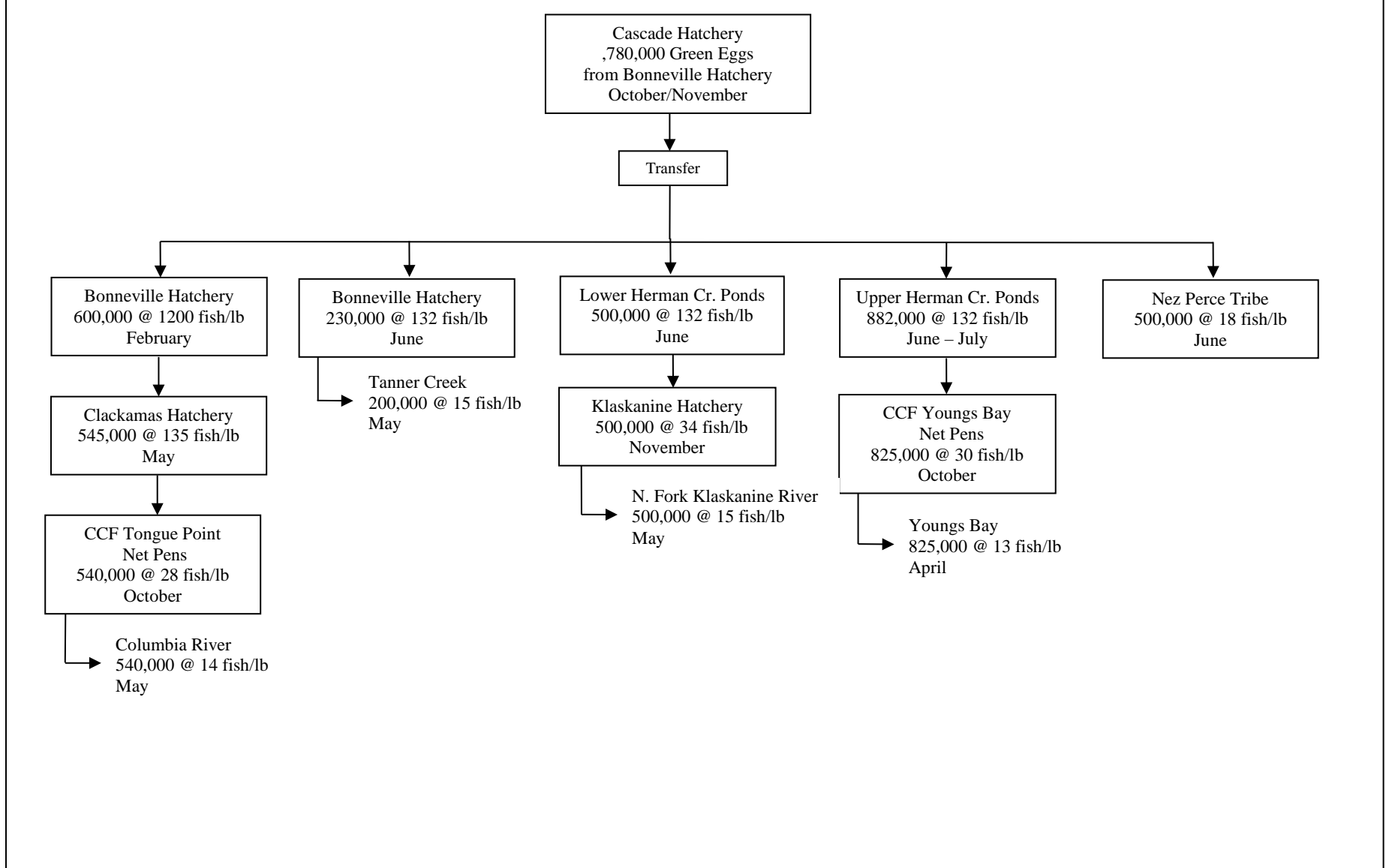
SPRING



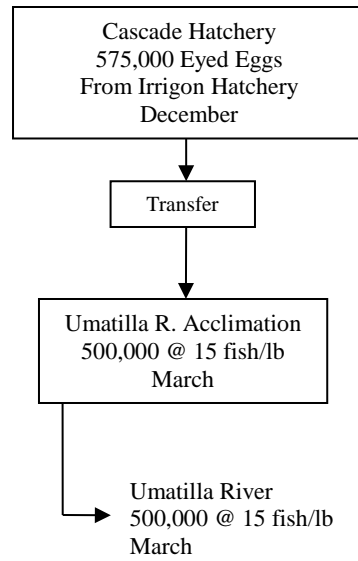
NOTE:
 INTAKE IS APPROX.
 2,900' UPSTREAM
 FROM HATCHERY

CASCADE		HATCHERY	
DRAWN	M. KALLAS	DATE	FEB. 1980
SCALE	1" = 100'	SHEET	PAGE

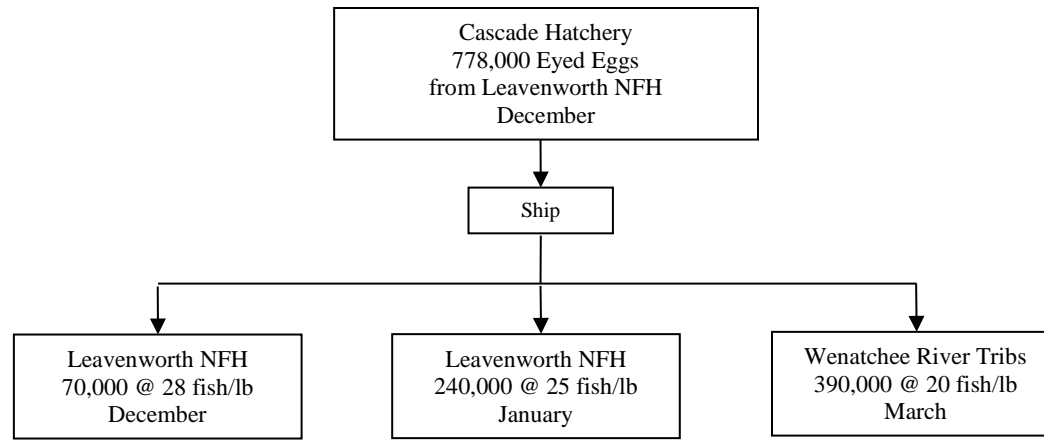
Cascade Hatchery Coho Salmon – Stock 14H (Tanner Creek)



**Cascade Hatchery
Coho Salmon – Stock 91H (Umatilla River)**



**Cascade Hatchery
Coho Salmon – Stock 508H (Mid-Columbia)**



Cascade Hatchery
Spring Chinook Salmon – Stock 11H (Sandy River)

