WILLAMETTE HATCHERY

PROGRAM MANAGEMENT PLAN
2023

Willamette Hatchery
(Dexter Ponds)

INTRODUCTION

Willamette Hatchery is located along Salmon Creek, approximately 3 miles upstream from its confluence with the Middle Fork of the Willamette River, 1 mile southeast of Oakridge on Fish Hatchery Road, off of Highway 58. The site is at an elevation of 1,217 feet above sea level, at latitude 43.9249 and longitude -122.8078. The site area is 108 acres. The hatchery is basically split into two separate rearing sections.

Dexter Holding Ponds, located immediately below Dexter Dam, is operated as a satellite facility. The Dexter site is at an elevation of 675 feet above sea level, at latitude 43.9248 and longitude - 122.8072.

Water flow available to the hatchery, based on the current water delivery system, ranges from a low of 29,623 gpm to a high 37,028 gpm. All rearing units receive single-pass water.

The hatchery is staffed with 9.7 FTE's.

Rearing Facilities at Willamette 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
Willamette										
Adult Holding Pond	250	20	1.90	9,500	1	9,500	earth/gravel	1940	Poor	
Brood Ponds	74	26.5	3.50	6,864	2	13,727	concrete	1953	fair	
Burroughs Ponds	80	20	2.50	3,710	40	14,400	concrete	1952	fair	
Canadian Troughs	16	2.67	1.75	75	13	975	fiberglass	1987	good	
Raceways	100	20	3.75	7,500	10	75,000	concrete	1953	fair	
Vertical Incubators					810		fiberglass	1980	good	
Dexter Ponds										
Adult Holding Pond	75	18	4.50	6,075	1	6,075	concrete	1978	good	
Raceways	135	18	6.00	14,580	4	58,320	concrete	1978	good	
Rearing Pond	172	64	6.00	66,048	1	66,048	asphalt	1978	good	

PURPOSE

Willamette Trout Hatchery and the adjacent Oakridge Salmon Hatchery were combined in 1983 and operate today as Willamette Hatchery. The trout hatchery was constructed in 1922 and the salmon hatchery in 1911. The U.S. Army Corps of Engineers (USACE) rebuilt the salmon hatchery in 1952 to mitigate for fishery losses caused by Hills Creek, Lookout Point and the Dexter hydroelectric/flood control projects. The trout side was rebuilt between 1950-56.

Today, Willamette Hatchery is used for adult holding/spawning, egg incubation and rearing of spring chinook and rainbow trout. The Dexter satellite facility serves as an adult collection, rearing and acclimation release site for spring chinook. All facilities are funded with state and federal revenues.

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.

Willamette Hatchery programs are harvest programs, used to mitigate for fishing and harvest opportunities lost due to habitat loss and migration blockage resulting from the Willamette Basin hydroelectric/flood control projects.

GOALS

Spring Chinook:

Middle Fork Willamette River (22H) Stock: To provide fish for harvest and to mitigate for hydro impacts and habitat loss. The goals of this hatchery program are:

- Replacement of spring Chinook in sports and commercial fisheries that were lost due to the construction and operation of Hills Creek, Lookout Point, Dexter (IHOT, 1997) and Fall Creek Dams.
- Increase the average annual run size and maintain recreational-catch opportunities.
- Return adequate fish to the Dexter facility to maintain the existing broodstock, as well as to have hatchery broodstock available as a reserve population for the naturally produced run.
- Maintain the hatchery population as similar to the historical wild run as possible (OAR 635-500-1663).

South Santiam River (24H) Stock: 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).
- Maintain suitable broodstock for ongoing and future population recovery efforts throughout the subbasin.

Rainbow Trout: to provide triploid rainbow trout to mitigate for trout harvest opportunities lost as a result of 13 flood control projects in the Upper Willamette River subbasin.

OBJECTIVES

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

Spring Chinook:

Middle Fork Willamette River (22H) Stock:
Provide 15,000 eggs for STEP.

Produce 1,722,000 fingerlings (17,220 pounds) for transfer to Dexter Ponds to produce 1,665,000 smolts (182,084 pounds) for release into the Middle Fork Willamette River.

Produce 528,000 smolts (54,205 pounds) for release into the Coast Fork Willamette River.

Produce 100,000 fingerlings (1,000 pounds) for release into Hills Creek Reservoir.

South Santiam River (24H) Stock:
Produce 1,100,000 fingerlings for transfer to South Santiam Hatchery.

Cutthroat Trout:

Hackleman Creek – Fish Lake (119) Stock:
Hold 15,000 fingerlings (60 pounds) for high lakes backpack stocking (even years only).

Rainbow Trout:

Cape Cod Triploid (72T) Stock:
Produce 270,000 legal-size trout (114,900 pounds) for stocking in various waterbodies.

Produce 225,000 fingerlings (9,000 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 and resident 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:

Middle Fork Willamette (22H) Stock: Adults arrive from May to October. Peak spawning occurs during mid-September. Adults are collected at Dexter Rearing Pond and trucked to the Foster Facility on the South Santiam for holding and spawning. The annual adult collection goal is 1,500 pairs, with up to 3,000 fish collected to account for brood losses.

South Santiam River (24H) Stock: No adults are collected at this facility (see South Santiam Hatchery Plan for additional information).

Rainbow Trout:

Cape Cod (72) Stock: Broodstock are maintained at Roaring River Hatchery.

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:

Middle Fork Willamette (22H) Stock:

Rear 1,722,000 fingerlings to a size of 100 fpp for transfer to Dexter Ponds in June for final rearing. All fish are otolith marked and fin-clipped and 330,000 are coded-wire tagged prior to transfer.

Release 300,000 smolts from Dexter Ponds at a size of 8 fpp into the Middle Fork Willamette in late October – early November. All fish are otolith marked and fin-clipped and 50,000 are coded-wire tagged prior to release.

Release 255,000 smolts from Dexter Ponds at a size of 12 fpp into the Middle Fork Willamette in early February. All fish are otolith marked and fin-clipped and 60,000 are coded-wire tagged prior to release.

Release 255,000 smolts at a size of 9 fpp from Dexter Ponds into the Middle Fork Willamette in early March. All fish are otolith marked and fin-clipped and 60,000 are coded-wire tagged prior to release. Due to the rebuild of Dexter Adult Collection facility these fish will be reared at Willamette Hatchery and released at Pengra Boat ramp from 2023- 2026.

Release 255,000 smolts at a size of 9 fpp from Dexter Ponds into the Middle Fork Willamette in late March. All fish are otolith marked and fin-clipped and 60,000 are coded-wire tagged prior to release. Due to the rebuild of Dexter Adult Collection facility these fish will be reared at Willamette Hatchery and released at Pengra Boat ramp from 2023- 2026.

Release 600,000 smolts from Dexter Ponds at a size of 9 fpp into the Middle Fork Willamette in mid-April. All fish are otolith marked and fin-clipped and 100,000 are coded-wire tagged prior to release. Due to the rebuild of Dexter Adult Collection facility these fish will be reared at Willamette Hatchery and released at Pengra Boat ramp from 2023- 2026.

Rear 267,000 smolts to a size of 9.5 fpp for release into the Coast Fork Willamette River in mid-February. All fish are otolith marked and fin-clipped and 45,000 are coded-wire tagged prior to release.

Rear 261,000 smolts to a size of 10 fpp for release into the Coast Fork Willamette River in early November. All fish are otolith marked and fin-clipped and 45,000 are coded-wire tagged prior to release. Due to the rebuild of Dexter Adult Collection facility these fish will be reared off station or will not be produced from 2023 – 2026.

Rear 100,000 fingerlings to a size of 100 fpp for release into Hills Creek Reservoir in early June. All fish are otolith marked and fin-clipped prior to release.

South Santiam River (24H) Stock:
Rear 1,100,000 fingerlings to a size of 150 fpp (7,333) for transfer to South Santiam Hatchery in late May – early June. All fish are otolith marked and fin-clipped, and 80,000 are coded-wire tagged prior to transfer.

Cutthroat Trout:

Hackleman Creek – Fish Lake (119H) Stock:
Hold 15,000 fingerlings at 200 fpp for high lakes backpack stocking in early July. This program occurs every other year (even years only).

Rainbow Trout:

Cape Cod Triploid (72T) Stock:

Rear 270,000 fish to a size of 2 fpp for liberations from Willamette Hatchery occurring March through October.

Transfer 76,500 fish at 5 fpp in Feb. to South Santiam Hatchery to finish and liberate.

Rear 225,000 fish to a size of 25 fpp for transfer to Leaburg Hatchery in July.

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 Management Plans outline broodstock selection and spawning protocols for some fish stocks. The following practices are currently being used at Willamette Hatchery:

Spring Chinook:

Middle Fork Willamette (22H) Stock: Adults are collected throughout the run. Most adults are collected during the middle of the run with smaller numbers collected at the early and late portions of the run. The annual spawning population is large enough to maintain a 1:1 male to female spawning ratio. The majority of the run is comprised of hatchery fish. Willamette, McKenzie and South Santiam spring chinook stocks are all acceptable stocks for use at Willamette Hatchery. During the construction of the new Dexter Facility adults will be collected from June 15th to July 15th. Fish will be transferred and held at Foster Adult Facility.

South Santiam River (24H) Stock: Broodstock selection and spawning take place at South Santiam Hatchery.

Cutthroat Trout:

Hackleman Creek – Fish Lake (119H) Stock: Broodstock selection and spawning take place at Oak Springs Hatchery.

Rainbow Trout:

Cape Cod (72) Stock: Broodstock selection and spawning take place at Roaring River Hatchery.

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 flow.

Fish Health Activities at Willamette Hatchery/Dexter Ponds

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. 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 are injected with antibiotics for the control of bacterial diseases.
- 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.
- 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 Ponded 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.

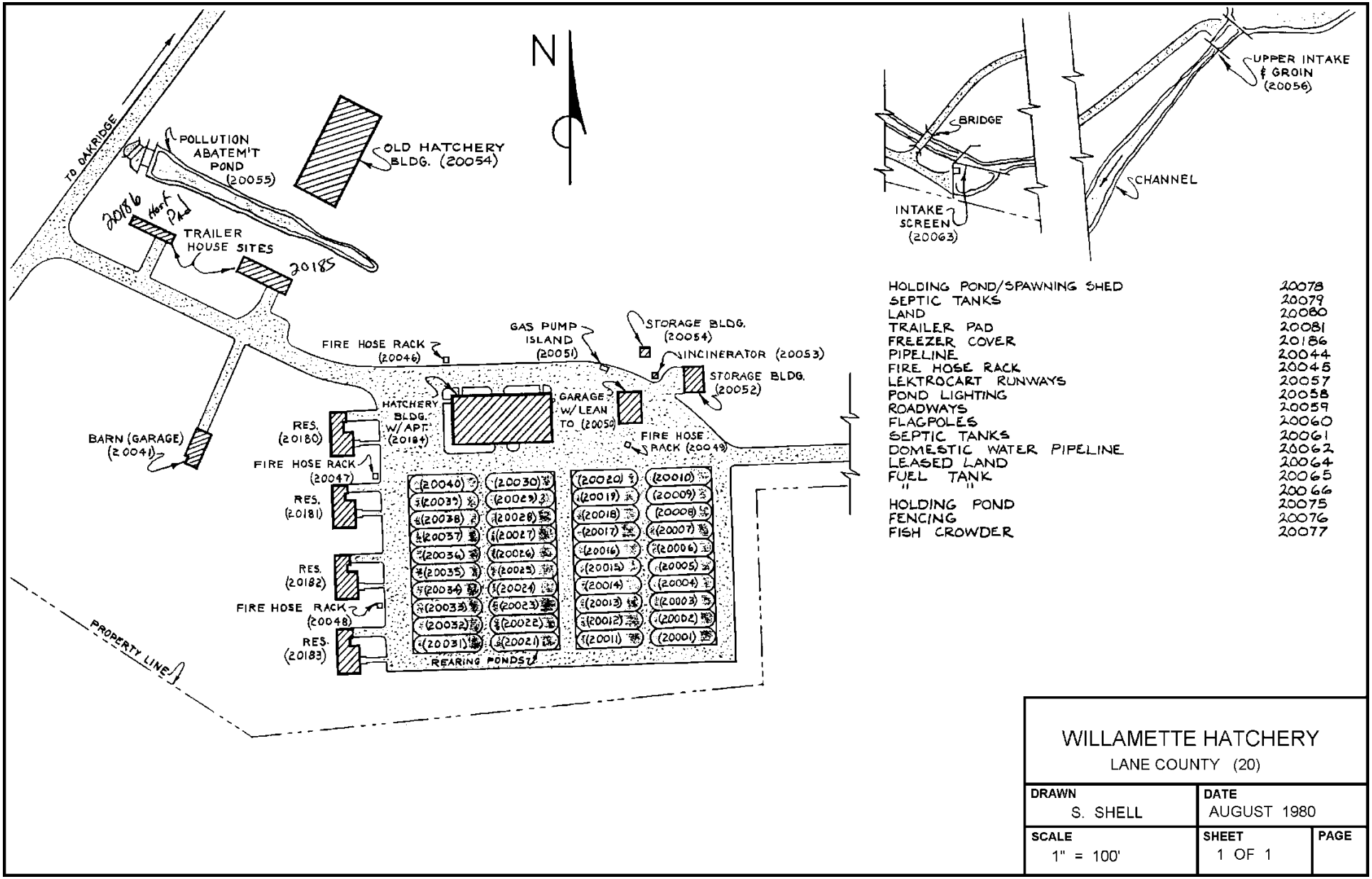
In-River Agreements: State and tribal representatives meet annually to set Columbia River harvests as part of the *U.S. v. Oregon Agreement*. Periodic meetings are also held throughout the year to assess if targets are being met.

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).

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

Willamette/Dexter facilities receive approximately 20,000 visitors each year.

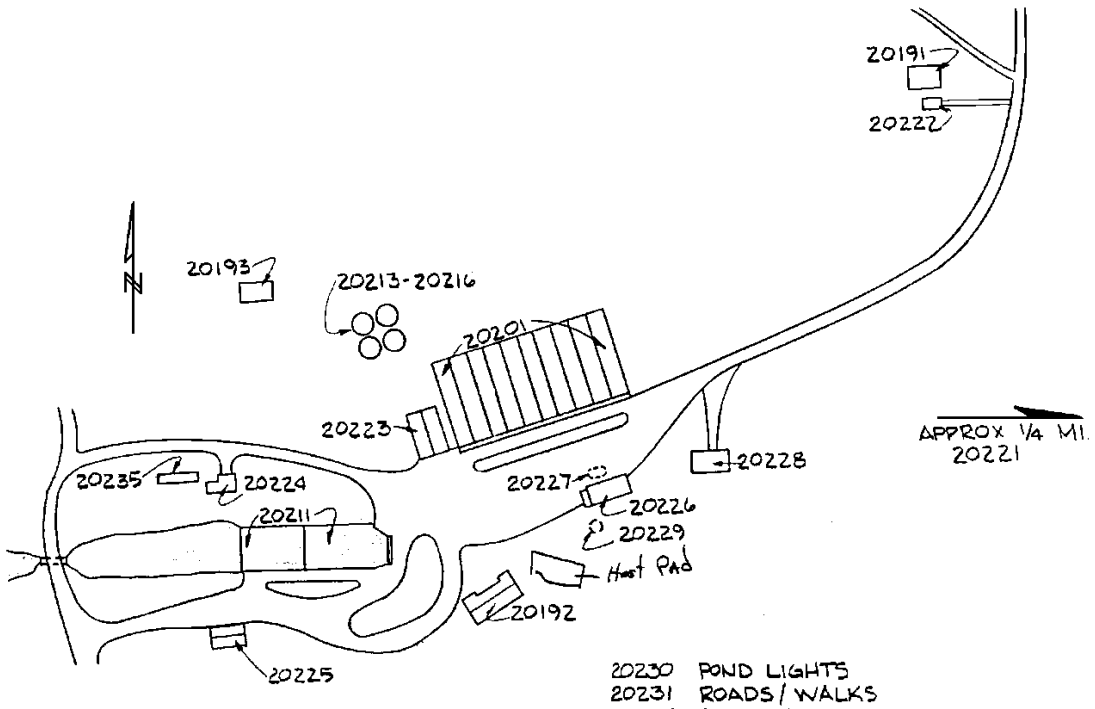


HOLDING POND/SPAWNING SHED	20078
SEPTIC TANKS	20079
LAND	20080
TRAILER PAD	20081
FREEZER COVER	20186
PIPELINE	20044
FIRE HOSE RACK	20045
LEKTROCART RUNWAYS	20057
POND LIGHTING	20058
ROADWAYS	20059
FLAGPOLES	20060
SEPTIC TANKS	20061
DOMESTIC WATER PIPELINE	20062
LEASED LAND	20064
FUEL TANK	20065
" "	20066
HOLDING POND	20075
FENCING	20076
FISH CROWDER	20077

WILLAMETTE HATCHERY

LANE COUNTY (20)

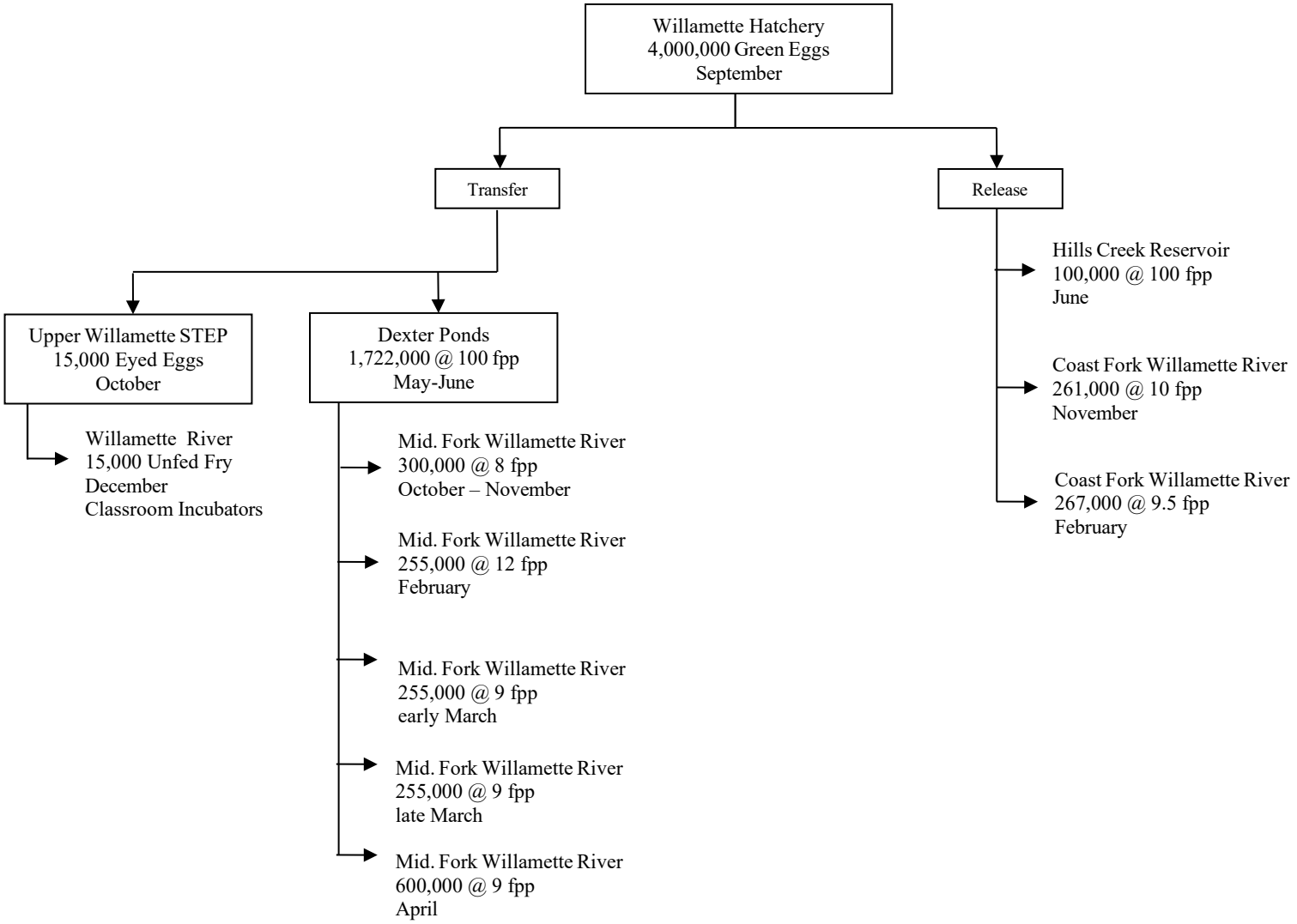
DRAWN	DATE	
S. SHELL	AUGUST 1980	
SCALE	SHEET	PAGE
1" = 100'	1 OF 1	



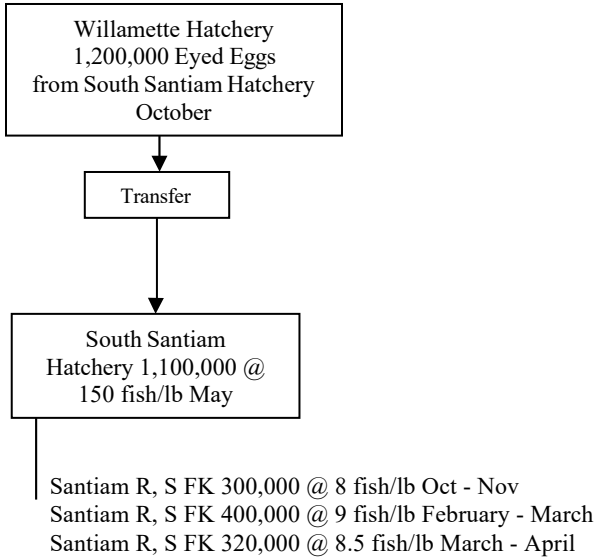
20230 POND LIGHTS
20231 ROADS / WALKS
20232 PIPELINE
20233 LANDSCAPING
20234 GROUNDS IMPROVEMENTS
20236 MOBILE HOME PAD
20199 POND WALKWAY

WILLAMETTE HATCHERY	
D. WYSS	FEB 4, 1991
1" = 100'	

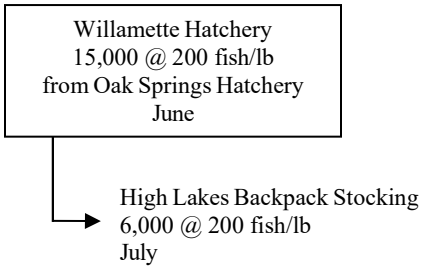
Willamette Hatchery
Spring Chinook Salmon – Stock 22H (Middle Fork Willamette)



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



Willamette Hatchery
Cutthroat Trout – Stock 119H (Hackleman Creek)
(even years only)



Willamette Hatchery
Rainbow Trout – Stock 72T (Cape Cod Triploid)