INTRODUCTION

Roaring River Hatchery is located along Roaring River (tributary to Crabtree Creek of the South Santiam River in the Willamette Basin) about 18 miles northeast of Albany, Oregon. The facility is at an elevation of 570 feet above sea level, at latitude 44° 37’ 28” N (44.62444) and longitude 122° 43’ 20” W (122.7222). The site area is 41 acres.

Water rights total 11,225 gpm from Roaring River. Water is delivered by gravity flow. Some water is pumped through a filter system to insure a clean supply for egg incubation and starter tanks. Low flow available to the hatchery is 3,366 gpm in October and the high flow is about 15,000 gpm during the winter/spring. Water is reused from the upper to lower ponds.

The hatchery is staffed with 4.8 FTE’s.

### Rearing Facilities at Roaring River Hatchery

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Length (ft)</th>
<th>Width (ft)</th>
<th>Depth (ft)</th>
<th>Volume (ft³)</th>
<th>Number Units</th>
<th>Total Volume (ft³)</th>
<th>Material</th>
<th>Age</th>
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PURPOSE

Roaring River Hatchery was constructed in 1924 and currently receives 75% funding from Federal sources through the Sport Fish Restoration Program, and 25% from license fees. Many
improvements have been made to the hatchery since original construction. In 1987 and 1996 new raceway ponds were constructed to replace the original raceways.

The hatchery is mixed-stock facility producing both anadromous fish and resident trout. The hatchery is used for rearing summer and winter steelhead from fingerling to smolt. The rainbow trout program involves broodstock maintenance, spawning, egg incubation and rearing.

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.

Roaring River Hatchery programs are harvest programs, used for the augmentation of fishing and harvest opportunities.

GOALS

Rainbow Trout: Meet subbasin fishery management objectives for six ODFW Fishery Districts, and produce trout for broodstock to meet program objectives.

Summer Steelhead: Produce fish to contribute to sport harvest in the Willamette and North Santiam River basins.

Winter Steelhead: To provide for an average annual sport harvest of 2,000 hatchery winter steelhead while minimizing interactions with wild fish, as outlined in the Siuslaw River Basin Fish Management Plan.

OBJECTIVES

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

Rainbow Trout:
- Cape Cod (072) Stock & Cape Cod Triploid (072T) Stock:
  - Provide 4,528,000 eggs to ODFW hatcheries, STEP, and private hatcheries.
  - Produce 60,000 fingerlings (857 pounds) for transfer to Salmon River Hatchery.
  - Produce 184,230 legal-sized trout (61,410 pounds) for release into streams and standing water bodies in three ODFW Fishery Districts.
Produce 6,600 legal-sized trout (2,200 pounds) for transfer to South Santiam, Bonneville and Cedar Creek Hatcheries.

Produce 1,000 legal-sized trout (333 pounds) for ODFW Fish Health Services for educational purposes.

Produce 5,105 trophy-sized trout (6,133 pounds) for release into streams and standing water bodies in three ODFW Fishery Districts.

**Summer Steelhead:**

*South Santiam River (024) Stock:*
Rear 96,000 smolts (21,334 pounds) for release into the Willamette River.

Rear 55,000 smolts (12,222 pounds) for release into the North Santiam River System.

**Winter Steelhead:**

*Sioulaw River (038) Stock:*
Produce 85,000 smolts (14,167 pounds) for release into the Sioulaw River System.

**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**

**Rainbow Trout:** Broodstock are maintained at the hatchery.

**Summer Steelhead:** No adults are collected at this hatchery. Summer steelhead fingerlings are shipped in from Oak Springs Hatchery.

**Winter Steelhead:** No adults are collected at this hatchery. Winter steelhead fingerlings are shipped in from Willamette 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. Steelhead are reared to sufficient size that smoltification occurs within nearly the entire population, which will reduce the retention time in downstream migration. All steelhead are released off-station. The specific rearing and release strategies used at this hatchery are outlined below.

**Rainbow Trout:**

- **Cape Cod Triploid (072T) Stock:** Rear 60,000 fingerlings to a size of 70 fish/pound for transfer to Salmon River Hatchery in mid-July.

- Rear 184,230 legal-size trout to a size of 3 fish/pound for release into various standing water bodies throughout the year.

- Rear 6,600 legal-sized trout for Free Fishing Day activities and hatchery displays.

- Rear 1,000 legal-sized trout for ODFW Fish Health Section for classroom dissection.

- Rear 3,135 fish to a size of 1.5 fish/pound for release into various standing water bodies throughout the year.

- Rear 1,970 fish to a size of 0.5 fish/pound for Free Fishing Day activities and for release into various standing water bodies throughout the year.
Summer Steelhead:

**South Santiam River (024) Stock:**
Rear 55,000 smolts to a size of 4.5 fish/pound release into the North Fork Santiam River in mid-March. All fish are fin-clipped prior to transfer.

Rear 96,000 smolts to a size of 4.5 fish/pound for non-acclimated release into the Willamette River in mid-April. All fish are fin-clipped prior to release.

Winter Steelhead:

**Siuslaw River (038) Stock:**
Rear 85,000 smolts to a size of 6 fish/pound for release into Whittaker Creek (70,000) and Green Creek (15,000) in early May. All fish are fin-clipped prior to release.

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

**Broodstock Selection and Spawning**

Rainbow Trout: Broodstock are spawned at a 1:1 male to female ratio. Triploidy is induced by pressure shocking the eggs shortly after fertilization.

Summer Steelhead: No spawning is conducted at this hatchery. See the South Santiam Hatchery Plan for summer steelhead spawning protocols.

Winter Steelhead: No spawning is conducted at this hatchery. See the Willamette Hatchery Plan for winter steelhead spawning protocols.

**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 Roaring River 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 dead fish (if available) and 4-6 live fish per lot.

- 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 lot of rainbow trout. Feeding fry (60 fish) are subsequently sampled for IPN virus because the brood fish are not killed at spawning. If prespawning mortality level is above normal, necropsies are conducted on dead adult fish for bacteria, parasites and other causes of death.

- 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.

- 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.

- 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.

- 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 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 Information System (HMIS): 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
Roaring River Hatchery receives approximately 18,000 visitors per year.
Roaring River Hatchery
Rainbow Trout – Stock 72 (Cape Cod Diploid)

Roaring River Hatchery
850,000 Green Eggs
December

Wallowa Hatchery
50,000 Eyed Eggs
January

8 Wallowa District waterbodies
39,720 @ 3 fish/lb, 335 @ 0.5 fish/lb
May - July
Roaring River Hatchery
Summer Steelhead – Stock 24 (South Santiam River)

Roaring River Hatchery
195,000 @ 200 fish/lb
from Oak Springs Hatchery
June

North Santiam River
55,000 @ 4.5 fish/lb
March

Willamette River (Island Park, Springfield)
10,500 @ 4.5 fish/lb
April

Willamette River (D Street Boat Ramp)
10,500 @ 4.5 fish/lb
April

Willamette River (Alton Baker Boat Ramp)
10,500 @ 4.5 fish/lb
April

Willamette River (Valley River Boat Ramp)
10,500 @ 4.5 fish/lb
April

M. Fork Willamette River (Clearwater Boat Landing)
12,000 @ 4.5 fish/lb
April

M. Fork Willamette River (Jasper Bridge)
12,000 @ 4.5 fish/lb
April

Willamette River (Beltline Rd)
30,000 @ 4.5 fish/lb
April
Roaring River Hatchery
Winter Steelhead – Stock 38 (Siuslaw River)

Roaring River Hatchery
85,000 @ 200 fish/lb
from Willamette Hatchery
June

Release

Whittaker Creek
70,000 @ 6 fish/lb
April

Green Creek
15,000 @ 6 fish/lb
April