# KLAMATH HATCHERY


# PROGRAM MANAGEMENT PLAN 2017

# Klamath Hatchery

## INTRODUCTION

Klamath Hatchery is located 8 miles west of Chiloquin just off Highway 62. The site is at an elevation of 4,120 feet, at latitude 42$^{o}$ 39’ 05” N (42.6503) and longitude 121$^{o}$ 56’ 47” W (121.9475). The site consists of 57.4 acres.

The hatchery water is obtained from five separate springs, which supply water to the rearing ponds and egg incubation facilities. The northern springs temperature is 49 degrees and the southern springs temperature is 45 degrees. Water rights are for 20 cfs.

The facility is staffed with 4.4 FTE's.

**Rearing Facilities at Klamath 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rearing Pond | 98.5 | 20 | 3 | 5,910 | 9 | 53,190 | concrete | | good | |
| Raceways | 70 | 9.5 | 2.5 | 1,663 | 7 | 11,638 | concrete | | good | |
| Raceways | 70 | 18.5 | 2.5 | 3,238 | 3 | 9,713 | concrete | | good | |
| Troughs | 15.5 | 2.6 | 1.5 | 60 | 16 | 967 | concrete | | good | indoor |
| Starter troughs | 16 | 1.17 | 0.4 | 7 | 32 | 240 | aluminum | | good | |
| Troughs | 10 | 2.5 | 1.4 | 35 | 4 | 140 | fiberglass | 2003 | excellent | |
| Vertical Incubators | | | | | 128 | | | | fair | 8 stacks of 16 trays |
| Vertical Incubators | | | | | 40 | | | 2003 | good | 5 stacks of 8 trays, isolation |

## PURPOSE

The Klamath Fish Hatchery was originally constructed in 1929. Many improvements have been made since original construction. The hatchery currently receives 75% funding from Federal sources through the Sport Fish Restoration Program, and 25% from license fees.

The hatchery produces legal and trophy sized rainbow trout, fingerling rainbow trout, brown trout, and cutthroat trout for release throughout the Klamath Basin, Deschutes Basin, Umpqua Basin and the southeast part of the state. The hatchery assist with remote egg takes for wild rainbow and brown trout at Crane Prairie and Wickiup Reservoirs.

## 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.

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

## GOALS

Brook Trout: Produce brook trout fingerlings to meet statewide trout management program objectives.

Brown Trout: Produce brown trout fingerlings to meet statewide trout management program objectives.

Cutthroat Trout: Produce cutthroat trout fingerlings to meet statewide trout management program objectives.

Rainbow Trout: Produce four different stocks of rainbow trout fingerlings, legal catchables and trophies to meet statewide trout management program objectives.

## OBJECTIVES

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

Brook Trout:

Three Creeks Lake (158W) Stock

Produce 175,000 unfed fry for transfer to Fall River Hatchery.

Hold 27,750 fingerlings (139 pounds) for high lakes airstocking (odd years only)

Brown Trout:

Wickiup (68W) Stock

Produce 10,000 fingerlings (333 pounds) for release into Lake of the Woods.

Produce 44,500 sub-legals (7,417 pounds) for release into various lakes.

Cutthroat Trout:

Lahontan (302W) Stock

Produce 40,000 fingerlings (2,000 pounds) for release into various lakes. Program is odd brood years only.

Rainbow Trout:

Oak Springs (53) Stock:
Rear 424,850 fingerlings (8,797 pounds) for release into various lakes and reservoirs.

Oak Springs Triploid (53T) Stock:
Rear 26,750 fingerlings (535 pounds) for release into various lakes and reservoirs.

Rear 49,000 sub-legals (6,125 pounds) for release into various lakes and reservoirs.

Cape Cod Triploid (72T)Stock:
Produce 112,000 fingerlings (470 pounds) for high lakes airstocking (odd years only)

Produce 3,000 fingerlings (30 pounds) for release into Blue Lake

Produce 68,000 sub-legals (7,650 pounds) for transfer to Rock Creek Hatchery.

Produce 9,500 sub-legals (950 pounds) for transfer to Elk River Hatchery.

Produce 23,000 sub-legals (5,750 pounds) and 23,000 legals (7,667 pounds) for transfer to Fall River Hatchery.

Produce 3,000 trophy fish (3,000 pounds) for transfer to Bandon Hatchery.

Produce 50,000 fingerlings (1,000 pounds) for release into Lake of the Woods.

Produce 15,000 sub-legals (1,875 pounds), 59,750 legals (12,317 pounds) and 13,200 trophies (25,350 pounds) for release into various lakes and rivers.

Eagle Lake Triploid (171T) Stock:
Rear 26,000 sub-legals (4,333 pounds) for release into various waterbodies.

Produce 33,200 fingerlings (166 pounds) for high lakes airstocking (odd years only)

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 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*

Brook Trout:

Three Creeks Lake (158W) Stock: No adult broodstock is kept at Klamath Hatchery; eggs are taken from wild adults captured at Three Creeks Lake.

Brown Trout:

Wickiup Reservoir (68W) Stock: Broodstock are collected with a collapsible box trap and weir and spawned at Brown's Creek (tributary of Deschutes River above Wickiup Reservoir). Peak spawning occurs from mid to late October.

Cutthroat Trout:

Lahontan (302W) Stock: No adult broodstock is kept at Klamath Hatchery; eggs are received from Omak Hatchery in Washington.

Rainbow Trout:

Oaks Springs Hatchery (53 and 53T) stock: No adult brood is kept at Klamath Hatchery.

Cape Cod (72 and 72T) Stock: No adult brood is kept at Klamath Hatchery.

Eagle Lake Triploid (171T) Stock: No adult brood is kept at Klamath Hatchery; eggs are received from Mt. Shasta Hatchery in California.

**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 for resident trout stocking programs are released only into standing water bodies to reduce impacts on natural stocks in streams.

Brook Trout:

Three Creeks Lake (158W) Stock:

Produce 175,000 unfed fry (175 pounds) for transfer to Fall River Hatchery in March for airstocking (odd years only).

Rear 27,750 fingerlings to a size of 200 fish/pound for high lakes airstocking in the Upper Rogue district in July (odd years only).

Brown Trout:

Wickiup Reservoir (68W) stock:

Produce 10,000 fish at a size of 30 fish/pound for release into Lake of the Woods in late September/early October.

Produce 44,500 fish at a size of 6 fish/pound for release into various lakes in June.

Cutthroat Trout:

Lahontan (302W) Stock:

Produce 40,000 fish at a size of 20 fish/pound for release into Mann Lake, Juniper Lake, Willow Valley Reservoir and Paiute Reservoir in early May (odd brood years only).

Rainbow Trout:

Oak Springs Hatchery (053) stock:

Rear 409,850 fish to a size of 50 fish/pound for release into various standing water bodies from May to September.

Rear 15,000 fish at 25 fish/pound for release into Miller Lake in July.

Oak Springs Hatchery Triploid (53T) stock:

Rear 26,750 fish to a size of 50 fish/pound for release into various waterbodies in May and June.

Rear 49,000 fish to a size of 8 fish/pound for release into various reservoirs in late September/early October.

Cape Cod Triploid (72T) Stock:

Rear 115,000 fingerlings to a size of 250 fish/pound for transfer to Fall River, Wizard Falls and Sandy hatcheries in July for subsequent high lakes air stocking (odd years only).

Rear 2,000 fingerlings to a size of 200 fish/pound for high lakes airstocking in early July (odd years only).

Rear 3,000 fingerlings to a size of 100 fish/pound for release into Blue Lake in early May.

Rear 50,000 fingerlings to a size of 50 fish/pound for release into Lake of the Woods in late June/early July.

Rear 15,000 fish to a size of 8 fish/pound for release into Hyatt Reservoir and Medco Pond in September.

Rear 23,000 fish to a size of 4 fish/pound and 23,000 to a size of 3 fish/pound for transfer to Fall River Hatchery in early April.

Rear 34,000 fish to a size of 10 fish/pound and 34,000 to a size of 8 fish/pound for transfer to Rock Creek Hatchery in mid-October.

Rear 9,500 fish to a size of 10 fish/pound for transfer to Elk River Hatchery in October.

Rear 3,200 fish to a size of 1 fish/pound for transfer to Bandon Hatchery in late October.

Rear 47,350 fish to a size of 3 fish/pound for release into various standing water bodies in April and May.

Rear 12,400 fish to a size of 2.0 fish per pound for release into various standing water bodies in June.

Rear 1,050 fish to a size of 1 fish/pound for release into various standing water bodies in November.

Rear 10,650 fish to a size of 0.5 fish/pound release into various standing water bodies from May and June.

Rear 1,500 fish to a size of 0.5 fish/pound for Free Fishing Day/Youth Fishing activities in June.

Eagle Lake Triploid (171T) Stock:
Rear 26,000 fish to a size of 6 fish/pound for release into various waterbodies in early June.

Rear 33,200 fingerlings to a size of 200 fish/pound for airstocking in Klamath District high lakes in late June/early 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 Klamath Hatchery:

Three Creeks Lake (158W) Stock Brook Trout: No broodstock is maintained or collected by the hatchery. Spawning takes place at Three Creeks Lake.

Wickiup Reservoir (68W) Stock Brown Trout: Adults are collected from Browns Creek, a tributary of Wickiup Reservoir and are spawned at a 1:1 male to female ratio.

Lahontan (302W) Stock Cutthroat Trout: No broodstock is maintained or collected by the hatchery. Eggs come from Omak Hatchery in Washington.

Oak Springs (53 and 53T) Stock Rainbow Trout: No broodstock is maintained or collected by the hatchery. Spawning takes place at Oak Springs Hatchery.

Cape Cod (72 and 72T) Stock Rainbow Trout: No broodstock is maintained or collected by the hatchery. Spawning takes place at Roaring River Hatchery.

Eagle Lake Triploid (171T) Stock Rainbow Trout: No broodstock is maintained or collected by the hatchery. Eggs come from Mt. Shasta Hatchery in California.

## 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 Klamath 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 at the hatchery.

- 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

- 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, and 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.

- Different lots of fish/eggs are physically segregated from each other by separate ponds, incubator units and water supplies. Some of the incubators have sheet metal splash guards to decrease cross contamination between incubator stacks.

- 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 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 whenever flows are altered for hatchery management activities (i.e., ponding of fish, splitting of fish lots, fish releases, etc.).

## 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.

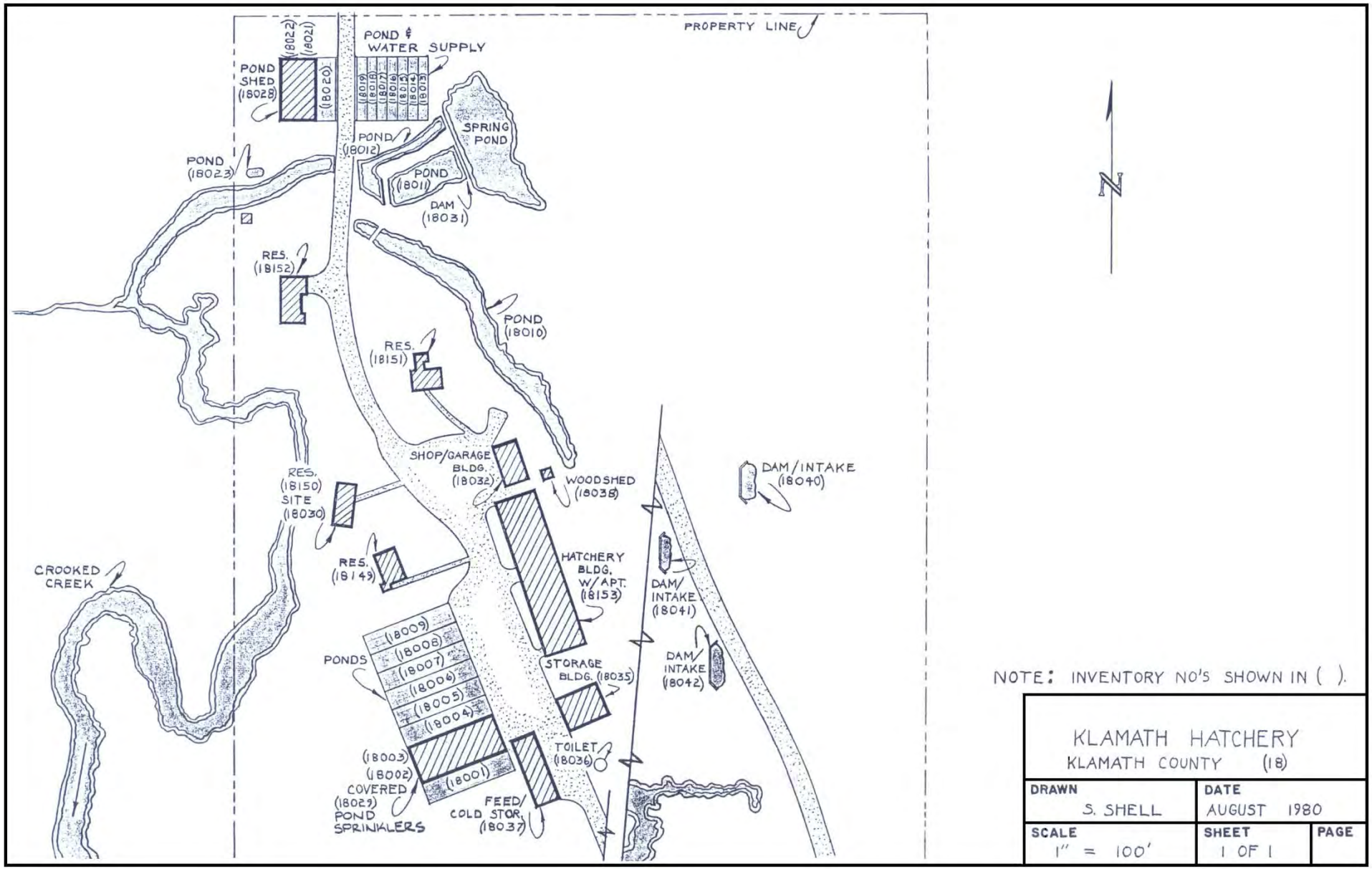
Hatchery Management System (HMS): Computerized system to collect, report, summarize and analyze hatchery production data. This system is a tool to be used in production control at all hatchery management levels.

### *Interagency Coordination Communication*

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.

### *Communication with the General Public*

Klamath Hatchery welcomes approximately 8,000 visitors annually.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SPRING POND
POND (18012)
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POND (18011)
DAM (18031)
RES. (18152)
POND (18010)
RES. (18151)
SHOP/GARAGE BLDG. (18032)
WOODSHED (18038)
DAM/INTAKE (18040)
RES. (18150) SITE (18030)
RES. (18149)
HATCHERY BLDG. W/APT. (18153)
DAM/ INTAKE (18041)
CROOKED CREEK
(18009)
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PONDS
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TOILET (18036)
COVERED (18029) POND SPRINKLERS
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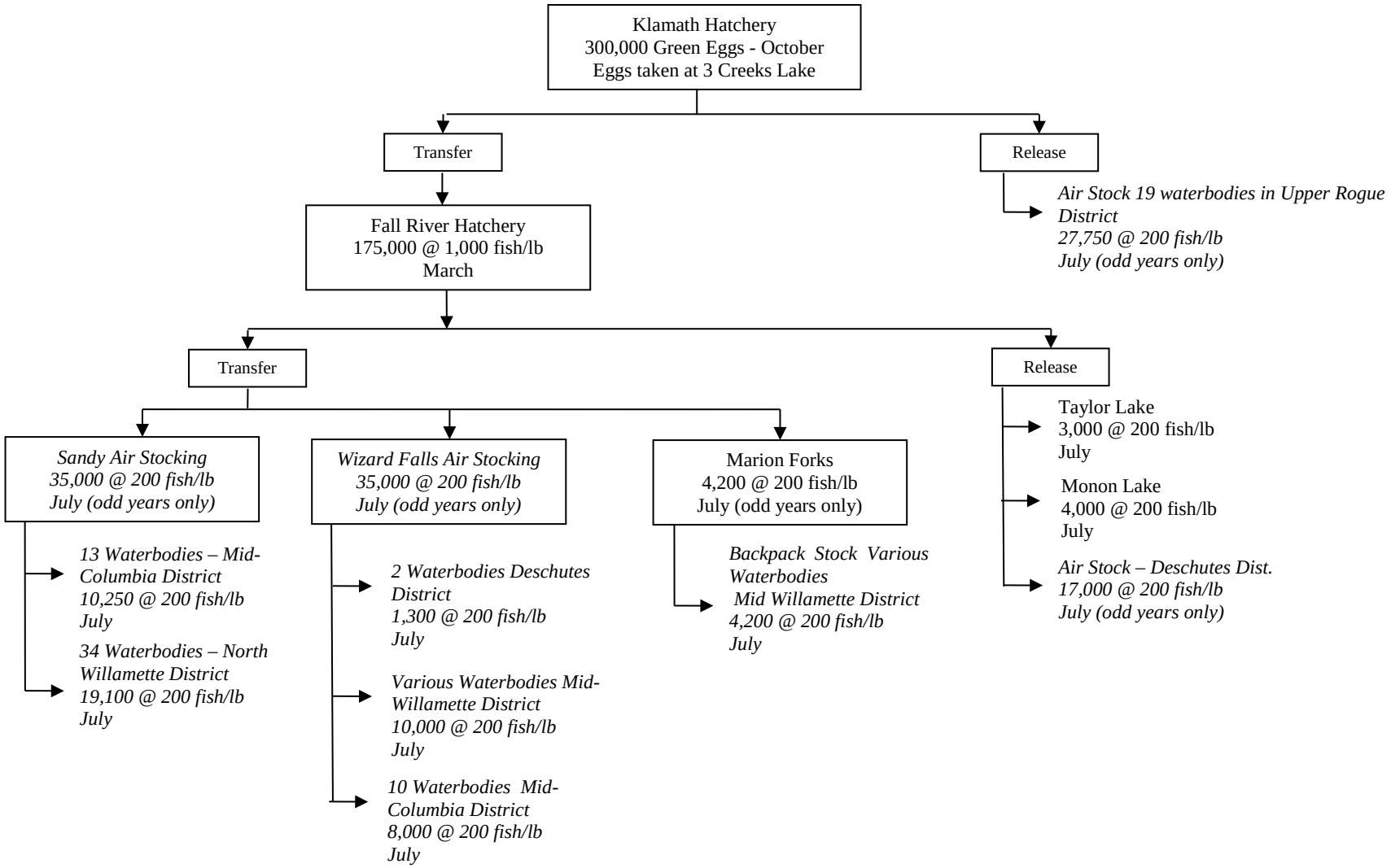
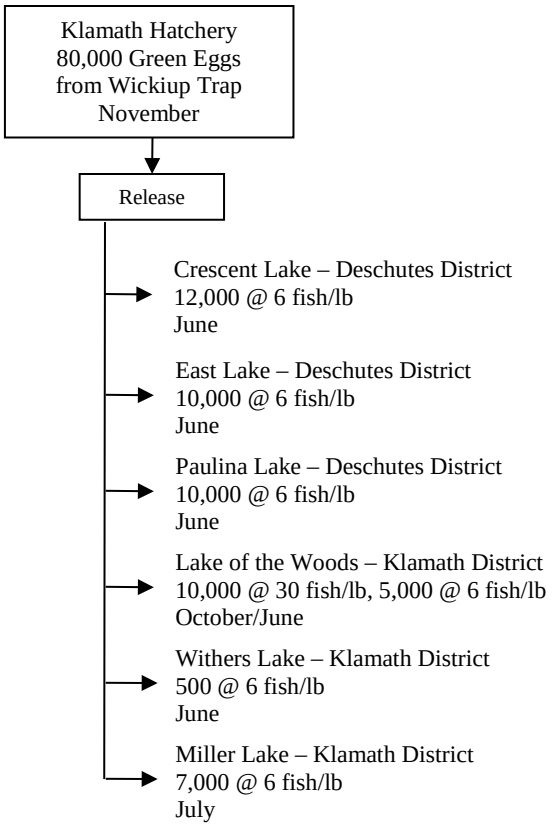
NOTE: INVENTORY NO'S SHOWN IN ( ).
KLAMATH HATCHERY
KLAMATH COUNTY (18)
DRAWN S. SHELL
DATE AUGUST 1980
SCALE 1" = 100'
SHEET 1 OF 1
PAGE

# Klamath Hatchery
# Brook Trout – Stock 158W (3 Creeks Lake)

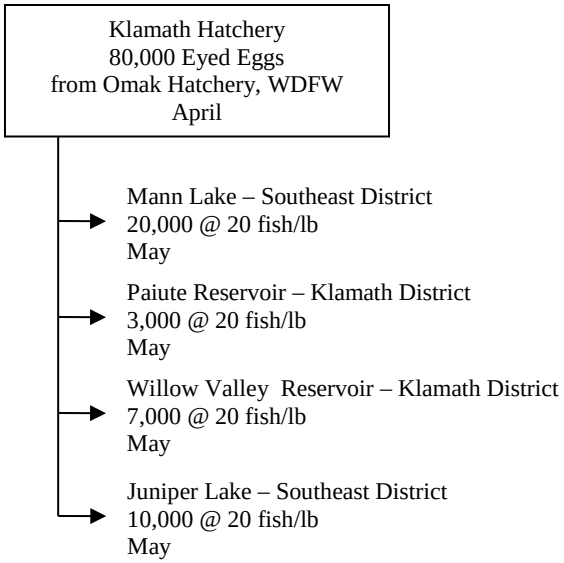


# Klamath Hatchery
# Brown Trout – Stock 68W (Wickiup Reservoir)

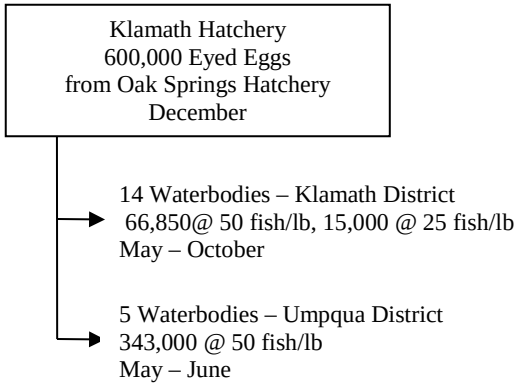


# Klamath Hatchery
# Cutthroat Trout – Stock 302W (Lahontan)

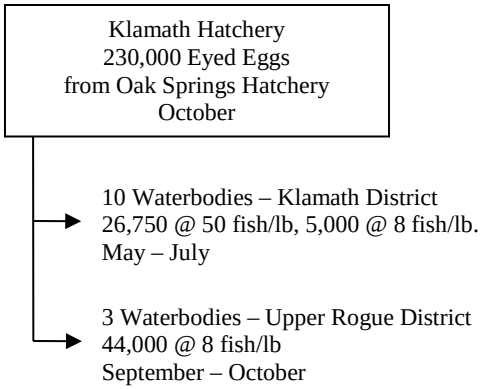
(Every other year – eggs received in odd brood years, fish released in even years)



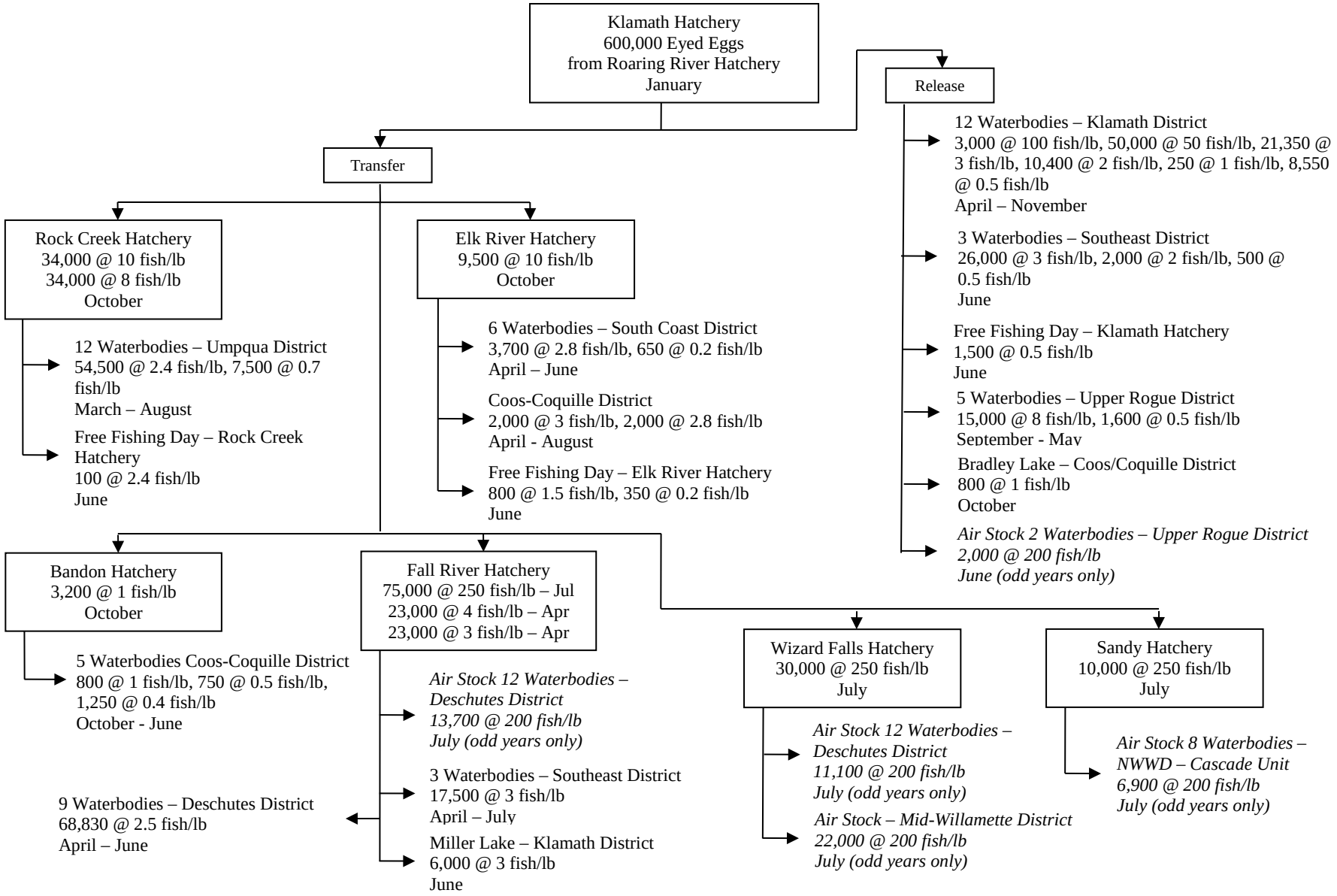
# Klamath Hatchery
# Rainbow Trout – Stock 53H (Oak Springs)



# Klamath Hatchery
# Rainbow Trout – Stock 53T (Oak Springs Triploid))



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



# Klamath Hatchery
# Rainbow Trout – Stock 171T (Eagle Lake Triploid))