

# **House Bill 3489 – Plan to Reform Department-Operated Fish Hatcheries on the Oregon Coast**

**Submitted by the Oregon Department of Fish and Wildlife  
December 14, 2010**

The 75<sup>th</sup> Oregon legislature directed the Oregon Department of Fish and Wildlife (ODFW) to develop a plan for reforming department-operated fish hatcheries on the Oregon coast, and asked the department to report findings to the 76<sup>th</sup> legislative assembly on or before October 1, 2010.

House Bill 3489 directed ODFW to do the following:

SECTION 1. (1) The State Department of Fish and Wildlife shall develop a plan to reform operation of department-operated fish hatcheries on the Oregon coast.

(2) The plan shall include provisions for the evaluation of current coastal hatchery programs with respect to:

- (a) Broodstock and production management strategies;
- (b) Hatchery infrastructure enhancement plans in support of management strategies;
- (c) Hatchery effluent management and National Pollutant Discharge Elimination system compliance recommendations;
- (d) Recommended strategies for the management of fish disease, and
- (e) Prioritization of deferred maintenance.

(3) The department shall complete the plan and submit the plan to an interim legislative committee related to environment and natural resources for review on or before October 1, 2010.

## Executive Summary

Acting on the direction received from the Legislature, ODFW assembled an internal team comprised of fish management, propagation, engineering, and fish health staff to develop this plan. The department-operated hatcheries considered in this plan are the Alsea, Bandon, Cedar Creek, Elk River, North Nehalem, Rock Creek, Salmon River, and Trask River Hatcheries; the Cole Rivers Hatchery was not considered in this plan as it is operated under an agreement with the Army Corps of Engineers as mitigation for lost fish production in the upper Rogue basin.

This plan is based on existing policies and plans, such as the Native Fish Conservation Policy (NFCP), the Fish Hatchery Management Policy (FHMP), the Fish Health Policy (FHP), Commission-adopted Conservation and Basin Plans, Hatchery Genetic Management Plans (HGMP), and the Oregon Plan for Salmon and Watersheds (OPSW). There is no comprehensive multi-species plan that provides a complete conservation and utilization framework from which ODFW can effectively reform the current programs. The current program largely reflects dated and hatchery-specific fish management objectives that do not encompass the collective needs across the Oregon Coast.

Based on the management and policy backdrop described above, ODFW offers the following Key Findings and Recommendations regarding reform of Oregon's coastal hatchery programs.

### **Key Findings:**

#### ***1. Overall ODFW continues to implement a strong program:***

- a. Despite long-standing budget challenges, ODFW hatchery managers and staff have met the fish management goals for their programs over the last decade:
  - i. Meeting production goals and providing diverse sport and commercial fisheries;
    1. In 2009, the production goal for Oregon's coastal hatcheries was 4,721,600 fish and the goal was met as follows:

|                     |           |
|---------------------|-----------|
| a. Winter Steelhead | 1,060,000 |
| b. Summer Steelhead | 290,000   |
| c. Coho             | 260,000   |
| d. Spring Chinook   | 705,000   |
| e. Fall Chinook     | 1,993,600 |
| f. Rainbow trout    | 413,850   |
| Total               | 4,722,450 |
    2. The most recent returns contributed 44,674 hatchery salmon and steelhead to sport and commercial fisheries and 151,540 trout to sport fisheries.
  - ii. The cost to implement this program for the 2009-2011 biennium is estimated at \$8,103,930 and is funded with a combination of general funds and license funds. These costs include hatchery

operations and maintenance, engineering, Fish Health Services, fish marking, and fish liberation.

**2. *Aggressively managing to minimize fish health issues;***

- a. ODFW Fish Health staff works continuously to reduce our reliance on drugs and chemicals in fish culture practices by implementing new technology such as moist air incubators. While complete elimination of therapeutics (chemical use) will not be possible, reductions have been made and should continue to be made. Water supplies that are free of or have reduced pathogens can improve adult holding conditions and increase survival. ODFW continues to ensure that chemicals are not improperly discharged into receiving waters.

**3. *Being good stewards of local watersheds;***

- a. All hatcheries reviewed have been in compliance with National Pollutant Discharge Elimination System permits (NPDES) system since 2007. Compliance was met despite the lack of or undersized abatement ponds. It should be noted, however, that major increases in production may require construction or expansion of existing abatement ponds.
- b. ODFW maintains a strong professional staff that has built lasting relationships in local communities; and has developed an army of volunteers, without which the hatcheries couldn't get their work done.

**4. *ODFW has made significant progress addressing long-standing deferred maintenance needs at state-operated hatcheries;***

- a. Since 2005, ODFW has made significant investments in reducing the backlog (\$2.1 million) of deferred maintenance needs at coastal hatcheries, through the judicious use of ODFW funds and supplemental funding from the Restoration and Enhancement Board.
- b. ODFW believes the remaining deferred maintenance needs are relatively manageable (\$1.1 million). The department has developed a priority list to address deferred maintenance and will seek to complete with existing budgets and additional requests to the R&E Board.
- c. Continued investments must be made to ensure the long-term sustainability of the system.

**5. *Existing Programs Need Few Changes to Address Current Management Needs;***

- a. Evaluations of existing hatchery programs suggest few adjustments to broodstock sources and fish production are needed to meet *current* management strategies. Adjustment will be considered during the development of a multi-species coastal conservation plan, e.g., the release of Siletz wild stock smolts in the Yaquina drainage will need to be addressed. Broodstock goals and production goals are being met with existing facility and personnel. Additional infrastructure at existing facilities may be required to implement multi-species coastal species conservation plan.

Based on these Key Findings, ODFW makes the following Key Recommendations for the reform of ODFW's Coastal Hatcheries:

### **Key Recommendations:**

#### ***1. Fully Fund the On-Going Operations, Maintenance and Monitoring Needs of the Existing Program;***

- a. The annual Operations and Maintenance needs of ODFW's coastal hatcheries have been chronically under-funded for decades. Operations and Maintenance has been eroded by ties to state general funds, and growth has not kept pace with the needs of the programs.
- b. The basic monitoring of hatchery programs, as called for in ODFW's Hatchery Management Policy, has not been fully funded, leaving managers unable to evaluate the performance of the programs and adaptively manage them as new information dictates.
  - i. ODFW's analysis found that critical monitoring data for programmatic review and reform was inadequate for analysis of strays, natural production, and sport/commercial fisheries. For example, south coast fall Chinook programs would benefit from marking of hatchery releases to identify hatchery fish on the spawning grounds and to assess ocean harvest contributions. Current assessment of harvest relies on punch card data which is not robust enough to evaluate all harvest (ocean and mixed stock) contributions. Foundational to any reform plan is a robust program for evaluating efficiency and effectiveness of propagation programs.

#### ***2. To fully realize hatchery reform, ODFW needs to complete a Coastal Multi-Species Conservation Plan to serve as the conservation and fisheries framework for reform;***

- a. Aside from Rogue fall Chinook and Oregon Coast coho, which have Commission-approved fish conservation plans, most coastal hatchery programs are largely based on outdated and hatchery-specific fish management goals. ODFW needs coast-wide management plans for fall Chinook, winter/summer steelhead and chum salmon to provide the conservation framework to revise fish management goals to reflect the management and conservation needs of species management units as directed by the Native Fish Conservation Policy. **As the result of these findings, in the fall of 2010 ODFW began development of a multi-species Coastal Conservation Plan, with the goal of completing this plan by December 2012.** When this plan is complete, ODFW will have completed conservation plans for all the significant coastal salmonids. The focus will be establishing the conservation framework that drives fish management for these species going forward, with an emphasis on addressing the conservation, fisheries and subsequent hatchery opportunities associated with a comprehensive coastal management plan. Critical scientific uncertainties such as strays and genetic introgression issues will be addressed by the Oregon Hatchery Research Center.

### ***3. The Time is Not Right for New Programs.***

- a. Without the multi-species Coastal Conservation Plan outlined above, ODFW has no reliable method to evaluate potential new hatchery/fishery opportunities and the conservation needs/risks associated with them. With a comprehensive plan, ODFW will have worked with the public to do the risk analysis and identify the trade-offs that might come with expanding existing programs in some places while reducing them in others.
- b. In addition, without adequate resources to operate, maintain, and monitor existing programs, adding new programs will ultimately be a further drain on the existing system.

## **(2) The plan shall include provisions for the evaluation of current coastal hatchery programs with respect to:**

### **a) Broodstock and production management strategies;**

ODFW raises winter and summer steelhead, fall and spring Chinook, coho salmon and rainbow trout at the eight coastal hatcheries. The following sections summarize our current broodstock and production management strategies by species/race at the coastal hatcheries.

#### **Winter Steelhead**

Winter Steelhead are produced in seven of the eight coastal hatcheries plus the Cole Rivers Hatchery (federal mitigation hatchery). Smolts are released in fourteen coastal watersheds from thirteen individual populations. The annual production goal is 1.1 million smolts and since 2006, ODFW has released an average of 1.0 million smolts annually (Table 1). Annual harvest is estimated at 17,600 adults or 96.7% of the identified goal. The program provides an economic benefit on average of \$3.98 for every dollar invested in production.

#### **Summer Steelhead**

Summer Steelhead are produced in three of the eight coastal hatcheries. Smolts are released in three coastal watersheds from three individual populations. The production goal is 290,000 smolts and since 2006, ODFW has released an average of 341,650 smolts annually (Table 2). Annual harvest is estimated at 4,408 adults or 62.4% of the goal. The program provides an economic benefit of \$3.28 for every dollar invested in production.

#### **Coho Salmon**

Coho are produced in four of the eight coastal hatcheries although coho produced at Salmon River are transferred and released in the Columbia River at Youngs Bay. Smolts are released in three coastal watersheds from three individual populations. The production goal is 260,000 smolts and since 2006, ODFW has released an average of 419,721 smolts annually (Table 3). Annual harvest is estimated at 4,836 adults or 127.9% of the goal. The program provides economic benefit of \$2.93 for every dollar invested in production.

### **Spring Chinook Salmon**

Spring Chinook are produced in three of the eight coastal hatcheries plus the Cole Rivers Hatchery (federal mitigation hatchery). Smolts are released in three coastal watersheds from three individual populations. The production goal is 705,000 smolts and since 2006, ODFW has released an average of 679,679 smolts annually (Table 4). Annual harvest is estimated at 5,777 adults or 44.8% of the goal. The program provides economic benefit of \$1.53 for every dollar invested in production.

### **Fall Chinook Salmon**

Fall Chinook are produced in five of the eight coastal hatcheries. The Coos River and Coquille STEP programs were included in the analysis due to their significant contributions to production and harvest goals. Smolts are released in seven coastal watersheds from seven different populations. The production goal is 1.99 million smolts annually and since 2006, ODFW has released an average of 1.64 million smolts annually (Table 5). Annual harvest is estimated at 12,366 adults or 106.2% of the identified goal. The program provides economic benefit of \$1.58 for every dollar invested in production.

### **Rainbow Trout**

Rainbow Trout are produced in six of the eight coastal hatcheries. Legal- and trophy-sized trout are released in 94 water bodies across the coastal watersheds. The majority of trout are production from ODFW domestic brood stock (Cape Cod) and few from a wild source in the Umpqua watershed. The annual production goal is 413,850 fish (Table 6) with an annual harvest goal of 165,720 fish.

### **(b) Hatchery infrastructure enhancement plans in support of management strategies;**

Hatchery infrastructure is currently supporting management strategies; however, repairs and enhancements would improve operations and increase the flexibility of the overall program as well as individual hatcheries. The level of enhancements ODFW ultimately recommends will depend on the outcome of the multi-species Coastal Conservation Plan.

Key elements in support of the current program might include:

1. Facilities:
  - a. Alsea Hatchery – a satellite facility in the Yaquina basin to provide for adult trapping and acclimation (Big Elk Creek).
  - b. Bandon Hatchery - multiple traps, weirs and acclimation sites in Coquille basin to more effectively manage broodstock collection and hatchery/wild interactions.
  - c. Cedar Creek Hatchery – improved weir, adult trapping, and passage at the Three Rivers site.
  - d. Trask Hatchery - Gold Creek hatchery weir
2. Fish Passage (design):
  - a. Alsea Hatchery
  - b. Bandon/Coquille programs
  - c. China Creek trap
  - d. East Fork Trask diversion
3. Hatchery Screening (meeting screening criteria):

- a. Alsea Hatchery
  - b. Cedar Creek Hatchery
  - c. North Nehalem Hatchery
  - d. Salmon River Hatchery
  - e. Trask Hatchery
4. Hatchery Operations needs:
- a. Bandon Hatchery – Fish liberation truck
  - b. North Nehalem Hatchery – backup generator replacement and jib crane on lower fish trap
  - c. Rock Creek Hatchery
    - i. Polymer coat two raceways and adult holding ponds
    - ii. UV water treatment system
    - iii. Replace wood pens with aluminum
    - iv. Shade cover for adult broodstock holding pen
    - v. Predator covers
    - vi. Five new raceways
    - vii. Intake design on North Umpqua
5. Salmon River—Replace adult holding pens

Most of these items will require an engineering design to estimate costs.

**(c) Hatchery effluent management and National Pollutant Discharge Elimination System compliance recommendations;**

Coastal Hatcheries has been in compliance with all NPDES requirements for the past 3 years. In order to ensure continued compliance with NPDES permits, the following preventive measures (estimated cost \$147,100) should be implemented:

- 1. Alsea Hatchery - Repair cracks in settling pond asphalt (~\$100,000)
- 2. Bandon Hatchery - Purchase portable pump and underground vacuum lines to move waste and chemically-treated wastewaters from rearing ponds to abatement ponds (~\$8,000)
- 3. Salmon River Hatchery - Excavation of the earthen abatement pond and proper disposal (~\$1,600)
- 4. Trask Hatchery - Repair or replacement of the pollution abatement pond and rebuilding or installation of a liner in the pollution abatement pond at Trask Pond (~\$37,500).

**(d) Recommended strategies for the management of fish disease;**

ODFW Fish Health Services recommends filtered and Ultraviolet-treated (UV) water supplies for egg incubation and early rearing at all coastal hatcheries. System size varies from 200 gallons per minute (gpm) to 700 gpm, depending on the hatchery. Secondary recommendations include a 3,000 gpm water treatment system for Elk River Hatchery, a 4,500 gpm system for Trask Hatchery, and a 1,400 gpm system for the Tuffy Creek facility. The department estimates it will cost \$1.5 million to retrofit the eight coastal hatcheries with UV treatment systems; a value engineering review is required to determine final costs.

Fish Health Services also supports experimenting with moist air incubation technology to further reduce the risk of pathogens along with reducing overall water use.

**(e) Prioritization of deferred maintenance;**

ODFW has reduced the coastal hatcheries deferred maintenance list to approximately \$1.1 million.

ODFW's prioritized list of maintenance includes:

1. Safety - Hand rails if required by OSHA, \$150,000.
2. Fish Culture - Water Valves replacement, \$121,350
  - a. Alsea Hatchery - \$20,000
  - b. Cedar Creek Hatchery - \$36,350
  - c. North Nehalem Hatchery - \$6,000
  - d. Rock Creek Hatchery - \$36,000
  - e. Trask Hatchery - \$23,000
3. Effluent Management - \$180,000
  - a. Alsea Hatchery - seal coat cracked settling pond, \$100,000
  - b. Bandon Hatchery – Pump and vacuum system, \$8,000
  - c. Trask Hatchery - replace pond membrane and associated tasks, \$72,000
4. Fish Culture - Raceway repairs - \$620,000
  - a. Alsea Hatchery - \$102,000
  - b. Bandon Hatchery - \$20,000
  - c. North Nehalem Hatchery - \$271,000
  - d. Rock Creek Hatchery (design) - \$20,000
  - e. Salmon River Hatchery - \$115,000
  - f. Trask Hatchery - \$92,000
5. Screens – \$100,000
6. Stream stabilization (Elk Creek intake) – \$10,000

| Table 1. Winter Steelhead Hatchery program summary |       |         |              |                |                |                |                |                  |
|----------------------------------------------------|-------|---------|--------------|----------------|----------------|----------------|----------------|------------------|
| Hatchery                                           | Stock | Purpose | Harvest Goal | Harvest (est.) | Release Number | 3-year average | Benefit / Cost | Release location |



|                                                                                                                                                                                      |                                   |         |        |        | Goal      |           | ratio(\$) |                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------|--------|--------|-----------|-----------|-----------|-----------------------------------------------------|
| Alsea                                                                                                                                                                                | Siletz                            | Harvest | 1,500  | 1,908  | 50,000    | 52,203    | 6.39      | Palmer Creek                                        |
| Alsea                                                                                                                                                                                | *Alsea Hatchery/Wild              | Harvest | 2,400  | 2,325  | 120,000   | 150,547   | 4.87      | Hatchery, Alsea River                               |
| Alsea                                                                                                                                                                                | *Alsea Wild                       | Harvest | Na     | 201    | 20,000    | 20,533    | 1.71      | Yaquina (Big Elk Cr.)                               |
| Bandon                                                                                                                                                                               | **Coos River                      | Harvest | 2,000  | 1,533  | 125,000   | 132,260   | 2.03      | Millicoma (E/W Forks)& S. Fork Coos River           |
| Bandon                                                                                                                                                                               | Coquille River & So. Fk. Coquille | Harvest | 3,000  | 2,360  | 118,000   | 114,891   | 7.18      | Coquille Tributaries (Ferry Cr.) S. Fork Coquille R |
| Bandon                                                                                                                                                                               | Ten Mile Lakes                    | Harvest | 2,000  | 209    | 21,000    | 20,468    | 1.79      | Eel, Saunders, and Tenmile creeks                   |
| Cedar Creek                                                                                                                                                                          | Nestucca Hatchery/wild            | Harvest | 1,900  | 1,509  | 195,000   | 210,633   | 2.46      | Nestucca Three Rivers Wilson*** Kilchis***          |
| Elk River                                                                                                                                                                            | Chetco                            | Harvest | 800    | 762    | 50,000    | 47,908    | 3.04      | Chetco River                                        |
| North Nehalem                                                                                                                                                                        | N. FK. Nehalem                    | Harvest | 1,300  | 1,498  | 130,000   | 135,296   | 2.01      | N.F. Nehalem& Necanicum                             |
| Rock Creek                                                                                                                                                                           | S. Umpqua                         | Harvest | 2,340  | 3,233  | 77,000    | 77,582    | 7.29      | S. FK. Umpqua & Deer Creek                          |
| Trask                                                                                                                                                                                | Wilson River                      | Harvest | 1,000  | 2,109  | 100,000   | 144,991   | 4.99      | Wilson                                              |
| Summary                                                                                                                                                                              |                                   |         | 18,240 | 17,647 | 1,006,000 | 1,107,312 | 3.98      |                                                     |
| *Alsea hatchery stock is used as back-up source for the wild Alsea program.<br>**Shipped to Cole Rivers Hatchery for incubation and rearing<br>***Released from Tuffy Creek facility |                                   |         |        |        |           |           |           |                                                     |

Table 2. Summer Steelhead Hatchery program summary

| Hatcher<br>y                                                                                                       | Stock        | Purpose     | Harves<br>t Goal | Harves<br>t (est.) | Release<br>Number<br>Goal | 3-year<br>averag<br>e | Benefit<br>/ Cost<br>ratio(\$) | Release<br>location                                 |
|--------------------------------------------------------------------------------------------------------------------|--------------|-------------|------------------|--------------------|---------------------------|-----------------------|--------------------------------|-----------------------------------------------------|
| *Cedar Cr.<br>& Salmon<br>River                                                                                    | Siletz       | Harves<br>t | 2,400            | 1,419              | 80,000                    | 67,343                | 3.69                           | Siletz River                                        |
| Cedar<br>Creek                                                                                                     | Nestucc<br>a | Harves<br>t | 1,000            | 1,126              | 100,00<br>0               | 150,547               | 1.97                           | Nestucca,<br>Three Rivers,<br>S.Fk. Wilson<br>River |
| Rock<br>Creek                                                                                                      | N.<br>Umpqua | Harves<br>t | 5,000            | 1,503              | 110,00<br>0               | 123,762               | 4.19                           | N.F.Umpqua<br>Galesville<br>Reservoir               |
|                                                                                                                    |              |             | 8,400            | 4,048              | 290,00<br>0               | 341,652               | 3.28                           |                                                     |
| *adults are collected and spawned by Cedar Creek hatchery, eggs shipped to Salmon River for incubation and rearing |              |             |                  |                    |                           |                       |                                |                                                     |

| Table 3. Coho coastal hatchery program summary                                    |                   |         |              |                |                     |                |                          |                                 |
|-----------------------------------------------------------------------------------|-------------------|---------|--------------|----------------|---------------------|----------------|--------------------------|---------------------------------|
| Hatchery                                                                          | Stock             | Purpose | Harvest Goal | Harvest (est.) | Release Number Goal | 3-year average | Benefit / Cost ratio(\$) | Release location                |
| *North Nehalem                                                                    | N.Fk. Nehalem     | Harvest | 1,000        | 627            | 100,000             | 160,705        | 0.72                     | N.Fk. Nehalem                   |
| Rock Creek                                                                        | S. Umpqua River   | Harvest | 2,400        | 3,320          | 60,000              | 105,695        | 6.83                     | Galesville, Umpqua, Cow Creek   |
| Rock Creek                                                                        | **N. Umpqua River | Harvest | na           | na             | na                  | na             | na                       | N.F.Umpqua Galesville Reservoir |
| Salmon River                                                                      | Big Creek         | Harvest | na           | na             | na                  | na             | na                       | CFF Youngs Bay, Columbia R      |
| Trask                                                                             | Trask River       | Harvest | 1,000        | 889            | 100,000             | 153,321        | 1.23                     | Trask River                     |
|                                                                                   |                   |         | 4,400        | 4,836          | 260,000             | 419,721        | 2.93                     |                                 |
| *N. Fork and Fish Hawk groups are released at the same location and were averaged |                   |         |              |                |                     |                |                          |                                 |
| **Program is discontinued in 2012; release numbers reduced to 60,000 in s. Umpqua |                   |         |              |                |                     |                |                          |                                 |

| Table 4. Spring Chinook coastal hatchery program summary |                 |         |              |                |                     |                |                          |                                 |
|----------------------------------------------------------|-----------------|---------|--------------|----------------|---------------------|----------------|--------------------------|---------------------------------|
| Hatchery                                                 | Stock           | Purpose | Harvest Goal | Harvest (est.) | Release Number Goal | 3-year average | Benefit / Cost ratio(\$) | Release location                |
| Cedar Creek                                              | Nestucca        | Harvest | 825          | 921            | 110,000             | 116,402        | 1.59                     | Nestucca River, Three Rivers    |
| Rock Creek                                               | N. Umpqua River | Harvest | 10,260       | 3,498          | 342,000             | 316,232        | 1.90                     | N.F.Umpqua Galesville Reservoir |
| Trask                                                    | Trask River     | Harvest | 1,800        | 1,358          | 253,000             | 247,045        | 1.10                     | Wilson R., Trask River          |
|                                                          |                 |         | 12,885       | 5,777          | 705,000             | 679,679        | 1.53                     |                                 |

| Table 5. Fall Chinook coastal hatchery program summary                                             |              |                |              |                |                     |                |                          |                                                    |
|----------------------------------------------------------------------------------------------------|--------------|----------------|--------------|----------------|---------------------|----------------|--------------------------|----------------------------------------------------|
| Hatchery                                                                                           | Stock        | Purpose        | Harvest Goal | Harvest (est.) | Release Number Goal | 3-year average | Benefit / Cost ratio(\$) | Release location                                   |
| Bandon                                                                                             | Coos River   | Harvest        | 4,000        | 4,026          | 205,000             | 760,767        | 0.75                     | Blossom Gulch, South Slough                        |
| Bandon                                                                                             | Coos River   | Harvest ; STEP |              |                | 800,000             |                |                          | Noble Creek, Millicoma River, Fourth Cr. Reservoir |
| Bandon                                                                                             | Coquille     | Harvest ;STEP  | 2,500        | 724            | 174,600             | 76,972         | 1.52                     | Cunningham Cr., Ferry Cr., Sevenmile Cr., Hall Cr  |
| Elk River                                                                                          | Elk River    | Harvest        | 2,500        | 3,705          | 325,000             | 325,508        | 1.47                     | Elk River                                          |
| Elk River                                                                                          | Chetco       | Harvest        | 600          | 665            | 150,000             | 172,927        | 0.56                     | Chetco River, Ferry Creek                          |
| *North Nehalem/Trask                                                                               | Trask        | Harvest        | 1,035        | 1,307          | 139,000             | 105,386        | 1.81                     | Necanicum R., Trask River                          |
| Salmon River                                                                                       | Salmon River | Harvest        | 1,000        | 1,939          | 200,000             | 202,592        | 1.71                     | Salmon River                                       |
|                                                                                                    |              |                | 11,635       | 12,366         | 1,993,600           | 1,644,152      | 1.30                     |                                                    |
| *adults are collected and spawned at Trask hatchery and 25,000 fish are produced at North Nehalem. |              |                |              |                |                     |                |                          |                                                    |

| Table 6. Rainbow Trout coastal hatchery program summary |                   |                |              |                |                     |                |                         |                                              |
|---------------------------------------------------------|-------------------|----------------|--------------|----------------|---------------------|----------------|-------------------------|----------------------------------------------|
| Hatchery                                                | Stock             | Purpose        | Harvest Goal | Harvest (est.) | Release Number Goal | 3-year average | Benefit/Cost ratio (\$) | Release location                             |
| Alsea                                                   | Cape Cod Triploid | Harvest        | 81,360       | Na             | 203,400             |                | unknown                 | Mid-Coast (21), Coast Range (9), Cascade (7) |
| Bandon                                                  | Cape Cod Triploid | Harvest        | 1,120        | Na             | 2,800               |                | unknown                 | Coos-Coquille (6); trophy-sized              |
| Elk River                                               | Cape Cod Triploid | Harvest        | 3,000        | Na             | 7,000               |                | unknown                 | South Coast (7)                              |
| North Nehalem                                           | Cape Cod Triploid | Harvest        | 33,560       | Na             | 83,950              |                | unknown                 | North Coast (18)                             |
| Rock Creek                                              | Cape Cod Triploid | Harvest        | 23,040       | Na             | 57,600              |                | unknown                 | Umpqua (13)                                  |
| Rock Creek                                              | Fish Creek        | Harvest Suppl. | 5,040        | Na             | 12,600              |                | unknown                 | Umpqua (4)                                   |
| Salmon River                                            | Cape Cod Triploid | Harvest        | 18,600       | Na             | 46,500              |                | unknown                 | North Coast (4), Mid Coast (5)               |
|                                                         |                   |                | 165,720      |                | 413,850             |                |                         |                                              |

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# **Oregon Department of Fish and Wildlife Coastal Hatcheries Evaluation (HB 3489)**

## **1. Introduction**

### **1.1 Background and Purpose**

During the 2009 legislative session HB 3489 was proposed and passed directing the Oregon Department of Fish and Wildlife (ODFW) to develop a plan to reform the operation of department operated fish hatcheries on the Oregon coast. The environment that these hatcheries operate in dictates that they are managed not as simply production facilities for sport and commercial harvest augmentation but as an integral part of the ODFW fishery management program. The use of the hatchery as a tool has been defined in the Native Fish Conservation policy (NFCP). In 2003 The NFCP, the Fish Hatchery Management Policy (HMP) and the Fish Health management Policy (FHP) were adopted into rule by the Oregon Fish and Wildlife Commission. The NFCP provides a basis for managing hatcheries, fisheries, habitat, predators, competitors and pathogens in balance with sustainable production of naturally produced native fish. The use of the hatchery as a tool within specific watersheds is established by the NFCP while the HMP provides the foundation for management and reform.

Each hatchery must be regularly evaluated as to how well it meets established goals in a conservation plan now and into the future. Foundational to any reform program is a robust program for evaluating this efficiency and effectiveness of propagation operations in meeting current needs, consistent with conservation plans, basin plan, policies, Hatchery Genetic Management Plans (HGMP) and the 25 year plan. These plans and policies often require additional facilities or modification to existing facilities to efficiently accomplish the objectives.

While there have been and presently are numerous programs monitoring and evaluating federally funded hatchery programs in the Willamette basin, Columbia River and Northeast Oregon, the coastal hatchery programs that are funded by license dollars, general funds or a mix of both have been left behind. During the 1980's and early 1990's there was intense monitoring of coastal programs including both marking and creel census effort but that has decreased substantially. For example, funding cuts have eliminated over 90% of the coded wire tag (CWT) monitoring of stocks. In addition, Fish Propagation headquarters staff that had monitored and managed facilities, maintenance and nutrition programs have been eliminated. The loss of these in place programs and staff have led to ad hoc department teams or contracted consultants to evaluate coastal hatchery programs. The result has been a patchwork of information that has not provided valuable decision making tools.

The purpose of this ODFW hatchery reform project is to develop a comprehensive plan for evaluating the coastal hatchery program and determine reform necessary to meet the existing ODFW NFCP, HMP, FHP, conservation plans, basin plans, HGMPs, Oregon Plan for Salmon and Watersheds and the 25 year Recreational Angling Enhancement Plan. As part of this task to develop a plan for reform, a working group of management and propagation staff was selected to reviewed and evaluate all of the state funded coastal hatcheries (Appendix G.).

The Development of a plan for reform is necessary for long range planning of facility design or modification, establishing scientifically defensible production goals, setting staffing levels and developing justifiable funding requests. One of the steps in this project is to establish what that reform plan will look like and the information needed to set that course to reform.

## **1.2 Evaluation Approach**

In setting out to develop a plan for reform of coastal hatcheries, a team of ODFW staff including district biologists, hatchery coordinator, fish health specialists, economists, and headquarters staff biologists was brought together. The initial tasking was to review existing hatchery operations plans, basin plans, HGMPs and past hatchery evaluations to ensure that these source documents were consistent as they presented existing hatchery programs. Where there were inconsistencies these were corrected immediately

The subsequent tasks were to evaluate the efficiency and effectiveness of the coastal hatcheries in meeting their established goals, were operations compliant with the NFCP, HMP, FHP and existing plans, address the specific tasks in HB 3489 and evaluate the department's ability to develop those requested strategies based on the information available. Salmon-Trout Enhancement Programs (STEP) were evaluated as they related to coastal hatcheries and meeting fishery management goals. Maintenance and facility improvement issues were evaluated by hatchery field staff based on the Master Maintenance Plan with recommendations provided. There was a review of the economic aspects of ODFW coastal hatcheries completed providing a picture of the value of these programs to Oregon and cost benefit ratio for each hatchery and stock.

The recommendations for operational and facility modification were developed for each hatchery and are found in specific hatchery recommendations and summary sections specific to fish health management, water quality and disease prevention, monitoring and evaluation, hatchery program assessment.

The Coastal Hatchery Evaluation document provides:

- an assessment of each hatchery program by fish stock
- an economic evaluation of the coastal hatcheries
- an evaluation for each facility
- recommendations for each facility
- evaluation and recommendations for monitoring and evaluation programs

- reports of onsite water quality and National Pollutant Discharge Elimination System (NPDES) compliance
- fish health evaluation and recommendation and reference documents were compiled as appendices to the review document
- deferred maintenance status and recommended improvements

As the review process developed, there were several major obstacles to quantifying a path to reform. With the exception of two indicator stocks at Elk River and Salmon River hatcheries, there has been no consistent program to evaluate contribution to the fishery in the other 29 salmon and steelhead programs at state funded coastal hatcheries. The ODFW conservation plans forming the basis for Hatchery Program Management Plans (HPMP) have not been completed. Developing reform recommendations proved a challenge to biologists in the absence of these conservation plans. The Master Maintenance Plan (MMP) which developed the list of deferred maintenance needed was primarily focused on facility condition without consideration for program reform and fish culture.

## **2. Review of ODFW Coastal Propagation Programs and Facilities**

### **2.1 Summary for ODFW Coastal Hatchery Programs**

ODFW has 31 Chinook, coho, and steelhead programs at State funded coastal hatcheries. In many instances the rearing of each life-stage (eggs, fry, fingerling, smolt) of any given stock is divided among multiple facilities due to logistical constraints (rearing space, equipment etc), or to facilitate acclimation to a given waterbody. The rearing history of each program is outlined in the discussion following this summary.

The primary objective of ODFW's coastal salmon and steelhead programs is to augment harvest in Oregon's ocean and freshwater fisheries. Thus, programs that are associated with high levels of spawning ground escapement are undesirable. A number of factors affect the numbers of fish available to harvest from a given program. Many of these are beyond the control of the facility. For example, freshwater and ocean conditions play a major role in determining the strength of a given year class. Similarly, harvest regulations that are based on wild fish escapement forecasts can significantly curtail the harvest of hatchery fish, resulting in higher escapement and returns to the hatchery.

We evaluated each program for 1) contribution to ocean and freshwater fisheries, 2) escapement to spawning grounds, and 3) return to the hatchery. We used data from brood years 1995-2004 (coho), 1994-2003 (Chinook), and 1986-2005 (Steelhead). These represent the ten most recent brood years for which we have complete cohort data.

We did not attempt to evaluate the performance of fry releases. It is thought that the survival of these programs is generally low (McGie 1980; Nickelson et al. 1986; Solazzi et al. 1999; Theriault et al. 2010). For Chinook and coho smolt releases, we used coded-wire tag (CWT) data to estimate the number of fish from each brood year that were caught in ocean fisheries between Alaska to California (Sport and

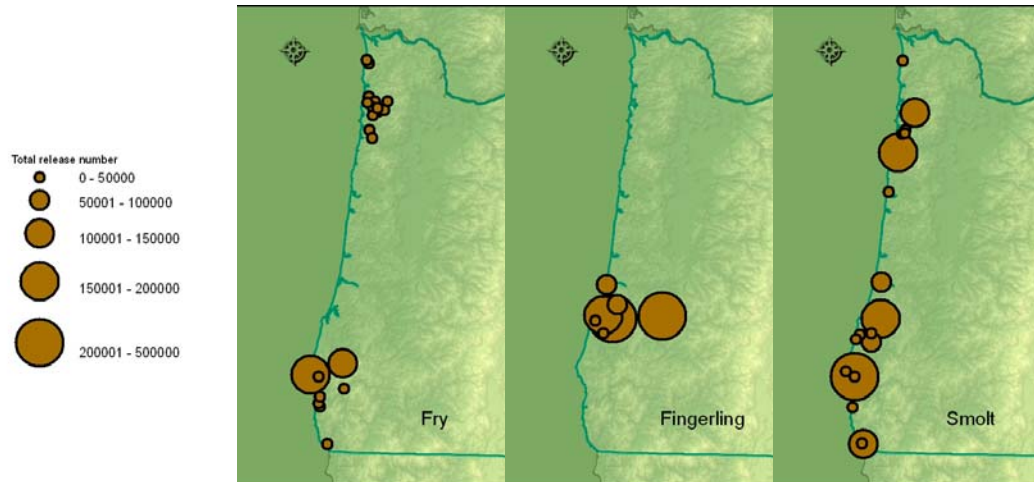
Commercial). Steelhead are not typically recovered in ocean fisheries. Ocean commercial and sport fisheries are typically well sampled so the expansions are relatively robust. However, the more restrictive fishing seasons in recent years have resulted in a decrease in the recovery of CWTs. Thus, the estimates of exploitation in fisheries that recover small numbers of CWTs are subject to a high degree of uncertainty.

For most freshwater Chinook, coho, and steelhead fisheries, ODFW does not consistently estimate the contribution of hatchery fish to harvest (but see note for Salmon River and Elk River below). Therefore, the estimates in this document are typically derived from punch card (voluntary reporting of angler harvest) data. The proportion of hatchery fish in the punch card catch estimates was based on the professional judgment of ODFW staff, scale data, or selective harvest of hatchery fish. Where two or more stocks of the same species were released in the same basin, angler harvest card data cannot be directly attributed to a particular stock, such as North Nehalem and Fishhawk stock winter steelhead released in the North Fork Nehalem. In these cases performance measures are calculated based on the release and return data combined for both stocks. Programs were associated with the hatchery from which the fish were reared and/or released. This method is associated with a high degree of uncertainty and appears to consistently overestimate harvest of fall Chinook. The factors causing this uncertainty are outlined in Section 2.6.11.

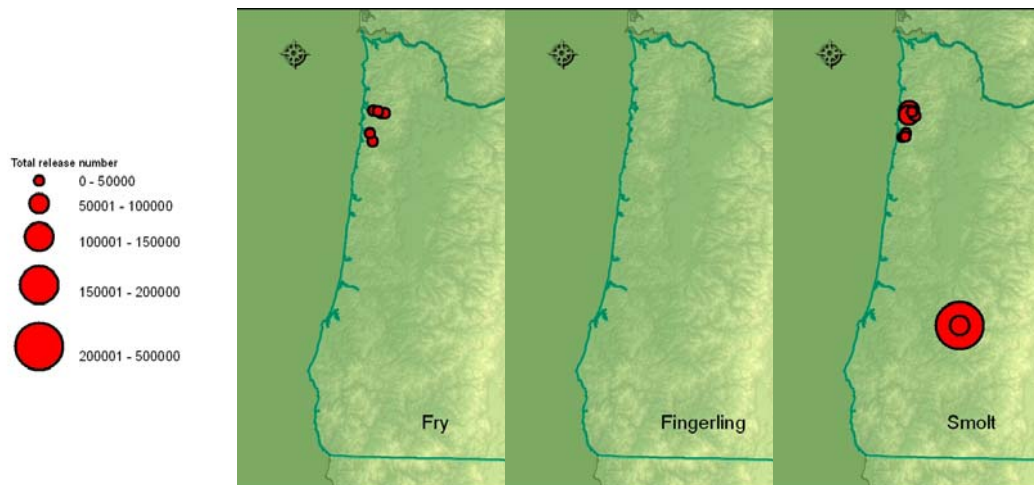
We estimated the numbers of fish returning to the hatchery using CWTs for Chinook and coho programs. For steelhead, we assigned the collection of fish at each hatchery to the respective brood year using scale data from the mid 1980's and early 1990's. In the Umpqua Basin, Winchester Dam counts (adjusted for harvest above the dam) were used in place of hatchery returns, because this is the broodstock collection site for Rock Creek hatchery and because only a small portion of the returning hatchery adults enter the trap at Rock Creek Hatchery. For programs that are released at acclimation sites we did not attempt to quantify hatchery returns because of a lack of adult collection.

We did not attempt to estimate the number of hatchery fish spawning on natural spawning grounds because the data currently collected is not sufficient to provide this level of resolution (but see note for Salmon River and Elk River below). Where data was available on the incidence of straying within a basin, it was included in a separate analysis.

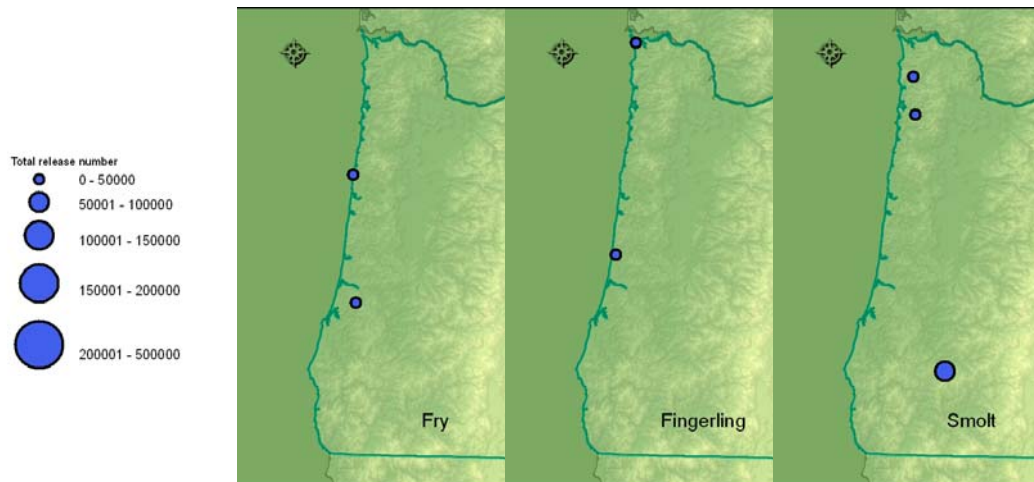
The Salmon River and Elk River fall Chinook freshwater harvest and spawning ground escapement are sampled annually by ODFW as part of the monitoring program for the Pacific Salmon Treaty. Thus, we used these estimates (based on CWT recoveries) to assign freshwater harvest and straying for each brood year. These estimates are relatively robust.



**Figure 1. Approximate distribution of ODFW fall Chinook releases (Data from 2008 Production Planning Schedule)**



**Figure 2. Approximate distribution of ODFW spring Chinook salmon releases (Data from 2008 Production Planning schedule)**



**Figure 3. Approximate distribution of ODFW Coho salmon releases (data from 2008 Production Planning Schedule)**

## **2.1.1 ODFW Fall Chinook Programs**

### **2.1.1.1 Trask Fall Chinook (Stock 34)**

Trask stock adult fall Chinook are typically collected at the Trask Hatchery trap located on Gold Creek. During some low water years the Trask Hatchery trap, located on the Trask River, has been used to trap adult fall Chinook. Spawning, incubation, and rearing activities occur at Trask River Hatchery. Approximately 80,000 eyed-eggs are transferred to STEP hatchbox facilities or are used in classroom incubators. Approximately 100,000 eyed eggs are transferred to the Whiskey Creek STEP facility on Netarts Bay for eventual release into the Wilson and Trask rivers as unfed fry. Approximately 100,000 eyed eggs are transferred to the Miami Anglers STEP hatchbox program located on Minich Creek (Miami River tributary) for eventual release as unfed fry into the Miami and Kilchis rivers. Approximately 26,000 fingerlings are transferred from Trask Hatchery to North Fork Nehalem Hatchery for final rearing to smolt size. Approximately 25,000 smolts are eventually released into the Necanicum River. Rearing to smolt size for the remaining 113,000 fish occurs at Trask Hatchery for eventual direct volitional release into the Trask River. The smolt releases in the Necanicum and Trask Rivers were marked with a representative CWT group to provide information on their performance (see below). There is no information on the performance of the fry releases.

The goal of this program is to provide hatchery fish for sport and commercial harvest in ocean and freshwater (FW) fisheries. In addition, this program provides educational opportunities to students and encourages volunteer involvement from the public via the Salmon and Trout Enhancement Plan (STEP). A portion of those activities includes the incubation of fall Chinook eggs and release of unmarked unfed fry. The primary purpose of the classroom incubator program is to teach students about salmonid life history and their habitat requirements.



**Necanicum Release:** The majority of Trask stock smolts that are released into the Necanicum River are captured as adults in Alaska and British Columbia commercial fisheries (Tables 1 and 2). During the previous seven brood years for which we have complete cohort data, an average of 35 adults (range 15-49) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled so harvest is calculated using punch card data and therefore is subject to considerable error. There is no hatchery or adult trapping facility on the Necanicum River so unharvested returning adults are likely to stray onto spawning grounds. However, there is no information regarding the number of hatchery fish that stray.

**Trask River release:** The majority (~68%) of Trask stock fall Chinook smolts that are released into the Trask River are captured as adults in Oregon FW sport fisheries, specifically Tillamook Bay and rivers (Tables 3 and 4). The Alaska commercial fisheries account for approximately 19% of the harvest. During the previous ten brood years for which we have complete cohort data, an average of 682 adults (range 358-974) were caught in Oregon marine and FW fisheries. The FW fisheries in this basin are generally not sampled so harvest is calculated using punch card data and therefore is subject to considerable error. There is no comprehensive information regarding the number of hatchery fish that stray onto spawning grounds because there are no standard Chinook spawning surveys in the Trask River basin.

**Table 1. Estimated number of Necanicum Basin adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on coded-wire tag (CWT) recoveries.**

|           |                 | Ocean Recoveries |     |    |    |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|----|----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA | OR | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      |                 |                  |     |    |    |    |       |            |                  |          |          |                 |         |        |
| 1995      |                 |                  |     |    |    |    |       |            |                  |          |          |                 |         |        |
| 1996      |                 |                  |     |    |    |    |       |            |                  |          |          |                 |         |        |
| 1997      | 27900           | 92               | 42  | 1  | 5  | 0  | 16    | 124        | 0                | 31       | UNK      | UNK             | 171     | 36     |
| 1998      | 26995           | 101              | 29  | 2  | 2  | 0  | 6     | 128        | 0                | 38       | UNK      | UNK             | 172     | 40     |
| 1999      | 25989           | 81               | 114 | 9  | 0  | 0  | 45    | 160        | 4                | 45       | UNK      | UNK             | 253     | 49     |
| 2000      | 25110           | 109              | 37  | 7  | 4  | 0  | 8     | 149        | 0                | 35       | UNK      | UNK             | 192     | 39     |
| 2001      | 26240           | 208              | 92  | 19 | 6  | 0  | 28    | 297        | 0                | 30       | UNK      | UNK             | 355     | 36     |
| 2002      | 25988           | 123              | 47  | 7  | 4  | 0  | 22    | 159        | 0                | 26       | UNK      | UNK             | 207     | 30     |
| 2003      | 28104           | 19               | 15  | 3  | 0  | 4  | 0     | 40         | 0                | 15       | UNK      | UNK             | 55      | 15     |
| Average   | 26618           | 105              | 54  | 7  | 3  | 1  | 18    | 151        | 1                | 31       | UNK      | UNK             | 201     | 35     |

**Table 2. Estimate of harvest of Necanicum Basin adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       |       |    |    |    |    |
| 1995       |       |    |    |    |    |
| 1996       |       |    |    |    |    |
| 1997       | 54    | 25 | 1  | 21 | 0  |
| 1998       | 59    | 17 | 1  | 23 | 0  |
| 1999       | 32    | 45 | 4  | 19 | 0  |
| 2000       | 57    | 19 | 4  | 20 | 0  |
| 2001       | 59    | 26 | 5  | 10 | 0  |
| 2002       | 59    | 23 | 3  | 14 | 0  |
| 2003       | 34    | 26 | 5  | 27 | 7  |
| Average    | 51    | 26 | 3  | 19 | 1  |

**Table 3. Estimated number of Trask Basin adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |    |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 58217           | 141              | 50  | 0  | 28  | 0  | 40    | 179        | 0                | 500      | 293      | UNK             | 719     | 528    |
| 1995      | 82655           | 79               | 86  | 0  | 7   | 0  | 30    | 142        | 0                | 353      | 639      | UNK             | 525     | 359    |
| 1996      | 66986           | 86               | 6   | 0  | 4   | 0  | 4     | 91         | 0                | 354      | 171      | UNK             | 449     | 358    |
| 1997      | 53296           | 233              | 101 | 5  | 52  | 0  | 143   | 249        | 0                | 547      | 476      | UNK             | 939     | 599    |
| 1998      | 66190           | 173              | 80  | 0  | 12  | 7  | 12    | 260        | 0                | 724      | 389      | UNK             | 996     | 736    |
| 1999      | 63252           | 226              | 262 | 14 | 54  | 0  | 138   | 419        | 0                | 739      | 968      | UNK             | 1296    | 793    |
| 2000      | 116738          | 535              | 293 | 54 | 44  | 0  | 144   | 782        | 4                | 804      | 1868     | UNK             | 1733    | 852    |
| 2001      | 113203          | 147              | 142 | 0  | 50  | 0  | 74    | 266        | 0                | 841      | 1794     | UNK             | 1180    | 892    |
| 2002      | 113899          | 838              | 647 | 0  | 124 | 0  | 429   | 1180       | 0                | 850      | 3199     | UNK             | 2459    | 974    |
| 2003      | 53239           | 27               | 5   | 0  | 7   | 0  | 7     | 32         | 0                | 720      | 81       | UNK             | 760     | 727    |
| Average   | 78768           | 249              | 167 | 7  | 38  | 1  | 102   | 360        | 0                | 643      | 988      | UNK             | 1106    | 682    |

**Table 4. Distribution of harvest of Trask Basin adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 20    | 7  | 0  | 73 | 0  |
| 1995       | 15    | 16 | 0  | 69 | 0  |
| 1996       | 19    | 1  | 0  | 80 | 0  |
| 1997       | 25    | 11 | 1  | 64 | 0  |
| 1998       | 17    | 8  | 0  | 74 | 1  |
| 1999       | 17    | 20 | 1  | 61 | 0  |
| 2000       | 31    | 17 | 3  | 49 | 0  |
| 2001       | 12    | 12 | 0  | 76 | 0  |
| 2002       | 34    | 26 | 0  | 40 | 0  |
| 2003       | 4     | 1  | 0  | 96 | 0  |
| Average    | 19    | 12 | 0  | 68 | 0  |

#### **2.1.1.2 Nestucca Fall Chinook (Stock 47)**

Nestucca stock fall Chinook adults are collected at Cedar Creek Hatchery's Three Rivers trap located in the Nestucca River watershed. Adults may also be collected by seining below the trap facility, or by volunteer anglers. Adults are held and spawned at Cedar Creek Hatchery in November and early December. The eggs are incubated on site and fry are reared for a period until they are transferred to Rhoades Pond, a volunteer run rearing facility located 5.5 miles east of Hebo, off Highway 22. The fall Chinook are reared to the smolt stage at Rhoades Pond, then released into Three Rivers and the Nestucca River in September.

The primary goal of this smolt rearing program is to provide hatchery produced fish for sport and commercial harvest in the ocean and sport harvest in the freshwater environment. Volunteer involvement in the Salmon Trout Enhancement Program (STEP) increases natural resource awareness and provides a volunteer base of individuals, and organizations, desiring to assist ODFW with natural resource program implementation activities.

**Nestucca R Release:** The release of Fall Chinook into the Nestucca has not been evaluated at present.

#### **2.1.1.3 Salmon River Fall Chinook (Stock 36)**

All adult fall Chinook brood are collected and spawned at the Salmon River Hatchery. All eggs are incubated and reared at the Salmon River Hatchery up to smolt stage, which (200,000 smolts) are directly released from the hatchery into the Salmon River.

The primary goal of the Salmon River fall Chinook program is to provide augmentation of sport and commercial fisheries for fall Chinook both in the ocean and in the Salmon River. These fish are also used as an indicator stock for the North Coast fall Chinook stocks in Oregon to develop ocean harvest management strategies between the US and Canada.

Hatchery fall Chinook spawning in natural habitats of Salmon River are problematic. On average, about 60% of the naturally spawning fall Chinook in Salmon River are of hatchery origin.

**Salmon R Release:** The majority of Salmon River stock smolts that are released into the Salmon River are captured as adults by Oregon FW sport and Alaskan commercial fisheries (Tables 5 and 6). During the previous ten brood years for which we have complete cohort data, an average of 1,012 adults (range 104-2,188) were caught in Oregon marine and FW fisheries. The FW fisheries and spawning grounds in this system are sampled as part of the Pacific Salmon Treaty monitoring program. Thus, our estimates of FW harvest and escapement rates are relatively

**Table 5. Estimated number of Salmon River adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |    |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 205215          | 442              | 304 | 0  | 35  | 0  | 74    | 706        | 0                | 829      | 71       | 839             | 1609    | 864    |
| 1995      | 186780          | 214              | 81  | 0  | 26  | 0  | 47    | 273        | 0                | 362      | 55       | 591             | 683     | 388    |
| 1996      | 203986          | 247              | 127 | 6  | 24  | 0  | 69    | 335        | 0                | 440      | 70       | 956             | 844     | 465    |
| 1997      | 205489          | 790              | 365 | 7  | 128 | 0  | 214   | 1077       | 0                | 1432     | 150      | 2513            | 2723    | 1560   |
| 1998      | 198979          | 733              | 251 | 13 | 102 | 0  | 147   | 952        | 0                | 1232     | 116      | 1382            | 2331    | 1334   |
| 1999      | 199089          | 1040             | 634 | 18 | 238 | 0  | 331   | 1599       | 0                | 1950     | 125      | 2769            | 3881    | 2188   |
| 2000      | 207468          | 1020             | 787 | 32 | 111 | 6  | 358   | 1598       | 0                | 1686     | 169      | 2179            | 3641    | 1797   |
| 2001      | 208878          | 722              | 584 | 21 | 75  | 0  | 297   | 1104       | 0                | 857      | 106      | 980             | 2258    | 932    |
| 2002      | 199100          | 409              | 287 | 14 | 59  | 0  | 177   | 592        | 0                | 430      | 108      | 505             | 1199    | 489    |
| 2003      | 210935          | 59               | 58  | 0  | 3   | 0  | 20    | 101        | 0                | 101      | 50       | 365             | 222     | 104    |
| Average   | 202592          | 568              | 348 | 11 | 80  | 1  | 174   | 834        | 0                | 932      | 102      | 1308            | 1939    | 1012   |

**Table 6. Distribution of harvest of Salmon River adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 27    | 19 | 0  | 54 | 0  |
| 1995       | 31    | 12 | 0  | 57 | 0  |
| 1996       | 29    | 15 | 1  | 55 | 0  |
| 1997       | 29    | 13 | 0  | 57 | 0  |
| 1998       | 31    | 11 | 1  | 57 | 0  |
| 1999       | 27    | 16 | 0  | 56 | 0  |
| 2000       | 28    | 22 | 1  | 49 | 0  |
| 2001       | 32    | 26 | 1  | 41 | 0  |
| 2002       | 34    | 24 | 1  | 41 | 0  |
| 2003       | 27    | 26 | 0  | 47 | 0  |
| Average    | 30    | 18 | 0  | 51 | 0  |

robust for this stock. The coded wire tag data suggest that a large number of hatchery fish spawn in Salmon River each year. Surveys of both wild and hatchery fish indicate that, on average, about 60 % of the naturally spawning fall Chinook in Salmon River are of hatchery origin. The presence of such large numbers of hatchery fall Chinook spawning in natural habitats of Salmon River is of concern.

#### **2.1.1.4 Smith River Fall Chinook (Stock 151)**

Smith River stock adult fall Chinook are collected at several sites throughout the lower Umpqua River. These include the STEP/Gardiner Creek facility; the Winchester Creek trap, located at River Mile (RM) 01 of the mainstem Umpqua River; The Mill Creek trap, on a tributary to the mainstem Umpqua at RM 24; the Smith River Falls trap, on a tributary to the Umpqua River at RM 12; and the North Fork Smith River trap. In addition, adults may be collected using tangle netting in Mill Creek, the lower Smith or Umpqua, and Winchester Creek, or, adults may be collected using hook-and-line in the lower Smith or Umpqua.

All of the lower Umpqua River fall Chinook broodstock are held at the Gardiner-Reedsport-Winchester Bay (GRWB) facility, located west of highway 101, south of the town of Gardiner in Douglas County, Oregon. The fish are also spawned at this facility and the eggs are then incubated to the eyed egg stage. GRWB STEP has a propagation permit that allows the rearing of 100,000 presmolts. These fish are reared on site, until being transferred to the acclimation site in Salmon Harbor. They are normally released in mid-June. The program also transfers eyed eggs to Rock Creek Hatchery. The fish are then reared to smolt stage and transferred to one of several acclimation sites in the lower Umpqua. These include, the GRWB STEP acclimation site; the Winchester Bay acclimation site, at dock 4 of Salmon Harbor (RM 01 of the Umpqua River); or the Umpqua Estuary acclimation site, near RM 11 at the docks behind the Discovery Center Museum in Reedsport.

The goal of this program is to provide fish for the intense and popular sport and commercial fall Chinook fishery in the ocean and Umpqua Estuary. Due to returning behavior of these program fish, this program also provides a significant fishery for bank anglers in Winchester Bay. Another important goal of this program is to educate and increase students/public awareness about salmon biology, life history and their habitat requirements.

**Umpqua R Release:** The Rock Creek Hatchery portion of this program began in 2005; evaluation of the program cannot be completed until sufficient data on adult returns has been collected.

#### **2.1.1.5 Coos River Fall Chinook (Stock 37)**

Coos River stock hatchery fall Chinook brood are collected at Morgan Creek, Millicoma Interpretive Center, and Noble Creek hatcheries. In addition, brood may also be collected using tangle-nets at tidewater on the Millicoma River, several locations on the East Fork Millicoma, and near the Millicoma Interpretive Center on the West Fork. Wild Coos adults are collected from two traps located near the head

of tidewater at RM 10 on the South Fork Coos River (Dellwood) and at RM 3.5 on the West Fork Millicoma River.

The fish are held and spawned at Morgan, Noble, and Millicoma hatcheries. All gametes are taken to Bandon Hatchery for fertilization and incubation to the eyed egg stage.

Approximately 500,000 eggs are retained at Bandon Hatchery to be reared to presmolts for release into the Coos River Basin at Morgan Creek and Blossom Gulch acclimation sites. The balance of eyed eggs are distributed to the Millicoma Interpretive Center and Noble Creek for presmolt production and to multiple hatchbox sites and classroom aquaria that are sited throughout the basin. Bandon Hatchery rears 447,500 presmolts that are transferred to two sites to be acclimated. Morgan Creek and Blossom Gulch receive 247,500 and 200,000 presmolts respectively. These groups are acclimated on the average about two to three weeks. Volunteer facilities also rear presmolts for direct release or transfer. Morgan Creek has a production goal of 645,000 presmolts that are reared and released on station. Beginning with the 2003 brood year an additional 5,000 presmolts have been reared at Morgan Creek and transferred to the Charleston Pond (OIMB) to be acclimated and released at that site. The program at OIMB is primarily an education and interpretation project, but adult fish are susceptible to harvest in ocean and lower bay fisheries. At the Noble Creek facility, the production goal is to rear and release 600,000 presmolts.

The primary purpose of this program is harvest augmentation using fish that are genetically and ecologically similar to wild populations. Another important goal of this program (STEP component) is to educate school students and public to increase awareness of salmonid biology, life history, and their habitat requirements.

**Coos R Releases:** The majority of Coos River stock smolts and pre-smolts that are released into the lower Coos Basin are captured as adults in Oregon FW Sport and Alaskan and British Columbian commercial fisheries (Tables 7 and 8). During the previous ten brood years for which we have complete cohort data, an average of 1,446 adults (range 556-2,585) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled so harvest is calculated using punch card data and therefore is subject to considerable error. There is no information regarding the number of hatchery fish that stray.

#### **2.1.1.6 Coquille River Fall Chinook (Stock 44)**

Coquille stock fall Chinook brood are collected at Bandon Hatchery and Cunningham Creek facilities. In addition, adults may also be collected using tangle-nets in the Coquille River near Arago, the North Fork Coquille near LaVerne Park, and the South Fork Coquille near Gaylord. The broodstock are held at Bandon Hatchery for spawning. The majority of eggs are incubated at Bandon Hatchery,

**Table 7. Estimated number of Coos Basin adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |      |     |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|------|-----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC   | WA  | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 498189          | 255              | 145  | 39  | 0   | 0  | 0     | 440        | 0                | 556      | 395      | UNK             | 995     | 556    |
| 1995      | 493572          | 234              | 81   | 0   | 29  | 0  | 9     | 335        | 0                | 675      | 1055     | UNK             | 1018    | 704    |
| 1996      | 508029          | 227              | 14   | 8   | 54  | 0  | 46    | 257        | 0                | 850      | 596      | UNK             | 1153    | 904    |
| 1997      | 528718          | 568              | 111  | 90  | 42  | 0  | 45    | 767        | 0                | 1049     | 2046     | UNK             | 1860    | 1091   |
| 1998      | 488571          | 783              | 367  | 111 | 199 | 0  | 206   | 1253       | 0                | 1334     | 2931     | UNK             | 2794    | 1533   |
| 1999      | 602468          | 2057             | 1331 | 458 | 443 | 0  | 328   | 3962       | 0                | 1657     | 7917     | UNK             | 5948    | 2101   |
| 2000      | 393005          | 876              | 896  | 175 | 212 | 0  | 190   | 1969       | 0                | 1871     | 2840     | UNK             | 4030    | 2083   |
| 2001      | 1193377         | 1888             | 2552 | 420 | 957 | 0  | 1122  | 4696       | 0                | 1628     | 7229     | UNK             | 7446    | 2585   |
| 2002      | 1603456         | 3103             | 5002 | 941 | 703 | 0  | 2642  | 7105       | 0                | 1175     | 7330     | UNK             | 10922   | 1877   |
| 2003      | 1298285         | 1536             | 1382 | 74  | 133 | 70 | 992   | 2203       | 0                | 897      | 2131     | UNK             | 4092    | 1030   |
| Average   | 760767          | 1153             | 1188 | 232 | 277 | 7  | 558   | 2299       | 0                | 1169     | 3447     | UNK             | 4026    | 1446   |

**Table 8. Distribution of harvest of Coos Basin adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 26    | 15 | 4  | 56 | 0  |
| 1995       | 23    | 8  | 0  | 69 | 0  |
| 1996       | 20    | 1  | 1  | 78 | 0  |
| 1997       | 31    | 6  | 5  | 59 | 0  |
| 1998       | 28    | 13 | 4  | 55 | 0  |
| 1999       | 35    | 22 | 8  | 35 | 0  |
| 2000       | 22    | 22 | 4  | 52 | 0  |
| 2001       | 25    | 34 | 6  | 35 | 0  |
| 2002       | 28    | 46 | 9  | 17 | 0  |
| 2003       | 38    | 34 | 2  | 25 | 2  |
| Average    | 27    | 20 | 4  | 48 | 0  |



although 129,000 eyed eggs are incubated at Coquille High School, Blue Creek, Camas Valley Elementary School, and Powers Elementary School for educational purposes.

In January, a total of 170,000 eyed eggs are transferred from Bandon to Cole Rivers Hatchery for incubation and rearing to smolts. An additional 22,500 eyed eggs are transferred from Bandon and reared to presmolts at Coquille High School; and approximately 116,500 eyed eggs, also from Bandon, are reared and released as unfed fry by various educational and STEP programs. Current unfed fry programs and release numbers are:

- Coquille High School—13,000 (educational—school hatchery)
- Archie Flood/Blue Creek—30,000 (STEP hatchbox)
- Camas Valley Elementary School—500 (educational—classroom incubator)
- Powers Elementary School—500 (educational—classroom incubator)
- Powers High School—60,000 (educational—hatchbox)
- Myrtle Crest Elementary School—500 (educational—classroom incubator)

A total of ~154,600 smolts are raised at Cole Rivers Hatchery, transferred back to the Coquille River, acclimated, and released at four sites in the Coquille estuary. Approximately 80,000 smolts are acclimated and released into Sevenmile Creek (RM 2.5), 10,000 smolts are acclimated and released into Cunningham Creek (RM 24), and 10,000 smolts are acclimated and released from a holding pen in lower Ferry Creek (RM 1—Bandon Harbor). The smolts released at Seven Mile have a CWT group to provide an estimate of their performance. The remaining fish are not CWT so we have no estimate of their performance.

The goal of this program is to provide hatchery fish for sport and commercial harvest that are genetically and ecologically similar to wild populations, while minimizing any potential adverse impacts to the wild population of this species or other species. Through its educational component at Coquille High School, Powers High School, and the elementary schools, this program also serves to increase student awareness of salmonid biology, life history, and their habitat requirements. Incubation and release of unfed fry at locations in the upper portion of the basin also serves to mitigate for the removal of wild fish from the population for the broodstock program.

**Coquille R Releases:** The majority of Coquille River stock smolts that are released into the Coquille Basin (at the Seven Mile acclimation site) are captured as adults in Oregon FW Sport and Alaskan and British Columbian commercial fisheries (Tables 9 and 10). During the previous eight brood years for which we have complete cohort data, an average of 240 adults (range 121-527) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. There is no information regarding the number of hatchery fish that stray. In addition, the lack of adult collection at the acclimation sites prohibits a viable estimate of hatchery returns.

**Table 9. Estimated number of Coquille Basin adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |     |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|-----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA  | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 31960           | 96               | 68  | 2   | 0   | 0  | 0     | 166        | 0                | 192      | UNK      | UNK             | 358     | 192    |
| 1995      |                 |                  |     |     |     |    |       |            |                  |          |          |                 |         |        |
| 1996      |                 |                  |     |     |     |    |       |            |                  |          |          |                 |         |        |
| 1997      | 59405           | 134              | 73  | 7   | 41  | 0  | 64    | 191        | 0                | 149      | UNK      | UNK             | 403     | 190    |
| 1998      | 54256           | 133              | 69  | 12  | 38  | 0  | 49    | 202        | 0                | 217      | UNK      | UNK             | 468     | 255    |
| 1999      | 96200           | 422              | 423 | 22  | 188 | 0  | 111   | 945        | 0                | 286      | UNK      | UNK             | 1341    | 474    |
| 2000      | 95255           | 373              | 385 | 22  | 203 | 13 | 239   | 757        | 0                | 324      | UNK      | UNK             | 1320    | 527    |
| 2001      | 95466           | 489              | 740 | 101 | 76  | 0  | 267   | 1139       | 0                | 310      | UNK      | UNK             | 1716    | 386    |
| 2002      | 91350           | 269              | 165 | 32  | 81  | 0  | 46    | 501        | 0                | 170      | UNK      | UNK             | 717     | 251    |
| 2003      | 91887           | 433              | 297 | 63  | 6   | 0  | 83    | 716        | 0                | 115      | UNK      | UNK             | 914     | 121    |
| Average   | 76972           | 294              | 277 | 33  | 79  | 2  | 107   | 577        | 0                | 220      | UNK      | UNK             | 724     | 240    |

**Table 10. Distribution of harvest of Coquille Basin adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 27    | 19 | 1  | 54 | 0  |
| 1995       |       |    |    |    |    |
| 1996       |       |    |    |    |    |
| 1997       | 33    | 18 | 2  | 47 | 0  |
| 1998       | 28    | 15 | 2  | 54 | 0  |
| 1999       | 31    | 32 | 2  | 35 | 0  |
| 2000       | 28    | 29 | 2  | 40 | 1  |
| 2001       | 29    | 43 | 6  | 22 | 0  |
| 2002       | 37    | 23 | 5  | 35 | 0  |
| 2003       | 47    | 32 | 7  | 13 | 0  |
| Average    | 33    | 26 | 3  | 38 | 0  |

#### **2.1.1.7 Elk River Fall Chinook (Stock 35)**

Elk stock fall Chinook brood are collected, held, and spawned at Elk River Hatchery, which is located on the Elk River at RM 14. The eggs are also incubated and the fish reared to smolt stage onsite. All smolts are released from the hatchery.

The goal of the Elk River fall Chinook program is to provide fish for commercial and sport fishing harvest, while minimizing any potential adverse impacts to the wild population of this species or other species.

**Elk R Release:** The majority of Elk River stock smolts that are released into the Elk River are captured as adults in Oregon FW Sport and marine fisheries (Tables 11 and 12). During the previous ten brood years for which we have complete cohort data, an average of 2,516 adults (range 622-5,205) were caught in Oregon marine and FW fisheries. The FW fisheries and spawning grounds in this system are sampled for CWTs, providing robust estimates of harvest and straying.

#### **2.1.1.8 Chetco River Fall Chinook (Stock 96)**

Chetco stock fall Chinook brood are collected from the Chetco River from October to December using beach seines and tangle nets. Adults are collected from throughout the run to maintain the genetic diversity of the population, and only Chetco River fall Chinook are used for broodstock. The adults are then transferred to Elk River Hatchery where they are held and spawned. The progeny are reared entirely at Elk River Hatchery until smolt stage, then transferred and released into the Chetco River in mid-September at RM 4.0 (Social Security Bar). This group has a CWT group to provide an estimate of their performance.

The goal of the Chetco River fall Chinook program is to provide fish for commercial and sport fishing harvest, while minimizing any potential adverse impacts to the wild populations, particularly the Southern Oregon and Northern California Coasts (SONCC) Coho which is listed as a threatened population under the federal ESA.

**Chetco R Release:** The majority of Chetco River stock smolts that are released into the Chetco Basin are captured as adults in Oregon FW Sport and Marine fisheries (Tables 13 and 14). During the previous ten brood years for which we have complete cohort data, an average of 499 adults (range 249-846) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. There is no information regarding the number of hatchery fish that stray. In addition, the lack of adult collection at the acclimation site prohibits a viable estimate of hatchery returns.

**Table 11. Estimated number of Elk River adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |     |      |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|-----|------|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA  | OR   | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 325889          | 543              | 205 | 50  | 1008 | 5  | 70    | 1740       | 0                | 890      | 1235     | 1514            | 2700    | 1898   |
| 1995      | 321567          | 601              | 255 | 45  | 1877 | 0  | 41    | 2738       | 0                | 1824     | 2495     | 2342            | 4602    | 3701   |
| 1996      | 322931          | 173              | 78  | 9   | 324  | 0  | 11    | 573        | 0                | 298      | 430      | 353             | 882     | 622    |
| 1997      | 328270          | 1145             | 873 | 335 | 2939 | 8  | 221   | 5079       | 0                | 2266     | 3825     | 5697            | 7565    | 5205   |
| 1998      | 350870          | 876              | 756 | 614 | 2801 | 43 | 517   | 4574       | 0                | 2161     | 2514     | 3928            | 7252    | 4962   |
| 1999      | 327987          | 891              | 888 | 326 | 2194 | 38 | 218   | 4120       | 0                | 1352     | 1883     | 2373            | 5690    | 3546   |
| 2000      | 330883          | 444              | 502 | 160 | 1473 | 22 | 97    | 2503       | 0                | 901      | 1351     | 2359            | 3501    | 2374   |
| 2001      | 312650          | 278              | 415 | 75  | 617  | 11 | 131   | 1264       | 0                | 261      | 688      | 768             | 1656    | 877    |
| 2002      | 323358          | 244              | 443 | 146 | 665  | 8  | 123   | 1383       | 0                | 424      | 915      | 612             | 1930    | 1089   |
| 2003      | 310671          | 147              | 122 | 97  | 537  | 11 | 58    | 857        | 3                | 348      | 573      | 319             | 1266    | 888    |
| Average   | 325508          | 534              | 454 | 186 | 1444 | 15 | 149   | 2483       | 0                | 1073     | 1591     | 2026            | 3705    | 2516   |

**Table 12. Distribution of harvest of Elk River adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 20    | 8  | 2  | 70 | 0  |
| 1995       | 13    | 6  | 1  | 80 | 0  |
| 1996       | 20    | 9  | 1  | 71 | 0  |
| 1997       | 15    | 12 | 4  | 69 | 0  |
| 1998       | 12    | 10 | 8  | 68 | 1  |
| 1999       | 16    | 16 | 6  | 62 | 1  |
| 2000       | 13    | 14 | 5  | 68 | 1  |
| 2001       | 17    | 25 | 4  | 53 | 1  |
| 2002       | 13    | 23 | 8  | 56 | 0  |
| 2003       | 12    | 10 | 8  | 70 | 1  |
| Average    | 15    | 13 | 5  | 67 | 0  |

**Table 13. Estimated number of Chetco River adult hatchery fall Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |    |    |     |     |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|----|----|-----|-----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC | WA | OR  | CA  | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 165717          | 0                | 0  | 11 | 519 | 0   | 94    | 436        | 13               | 192      | UNK      | UNK             | 736     | 725    |
| 1995      | 226309          | 0                | 0  | 0  | 355 | 121 | 258   | 218        | 0                | 149      | UNK      | UNK             | 625     | 504    |
| 1996      | 233621          | 0                | 0  | 0  | 70  | 0   | 22    | 47         | 0                | 217      | UNK      | UNK             | 287     | 287    |
| 1997      | 158208          | 0                | 0  | 9  | 437 | 91  | 227   | 311        | 0                | 286      | UNK      | UNK             | 824     | 723    |
| 1998      | 164741          | 0                | 0  | 0  | 89  | 55  | 85    | 60         | 0                | 324      | UNK      | UNK             | 469     | 413    |
| 1999      | 158150          | 0                | 0  | 0  | 110 | 456 | 98    | 468        | 0                | 310      | UNK      | UNK             | 876     | 420    |
| 2000      | 156088          | 0                | 16 | 21 | 676 | 674 | 33    | 1354       | 0                | 170      | UNK      | UNK             | 1556    | 846    |
| 2001      | 155941          | 0                | 0  | 33 | 428 | 0   | 33    | 429        | 0                | 115      | UNK      | UNK             | 576     | 543    |
| 2002      | 153681          | 0                | 0  | 0  | 148 | 36  | 20    | 165        | 0                | 131      | UNK      | UNK             | 315     | 279    |
| 2003      | 156810          | 0                | 0  | 0  | 145 | 135 | 99    | 181        | 0                | 104      | UNK      | UNK             | 384     | 249    |
| Average   | 172927          | 0                | 2  | 8  | 298 | 157 | 97    | 367        | 1                | 200      | UNK      | UNK             | 665     | 499    |

**Table 14. Distribution of harvest of Chetco River adult hatchery fall Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |     |    |
|------------|-------|----|----|-----|----|
|            | AK    | BC | WA | OR  | CA |
| 1994       | 0     | 0  | 2  | 98  | 0  |
| 1995       | 0     | 0  | 0  | 81  | 19 |
| 1996       | 0     | 0  | 0  | 100 | 0  |
| 1997       | 0     | 0  | 1  | 88  | 11 |
| 1998       | 0     | 0  | 0  | 88  | 12 |
| 1999       | 0     | 0  | 0  | 48  | 52 |
| 2000       | 0     | 1  | 1  | 54  | 43 |
| 2001       | 0     | 0  | 6  | 94  | 0  |
| 2002       | 0     | 0  | 0  | 88  | 12 |
| 2003       | 0     | 0  | 0  | 65  | 35 |
| Average    | 0     | 0  | 1  | 80  | 18 |

## **2.1.2 ODFW Spring Chinook Programs**

### **2.1.2.1 Trask Spring Chinook (Stock 34)**

Trask stock spring Chinook brood are collected at trapping facilities at Trask Hatchery where they are also held and spawned. Approximately 50,000 eyed-eggs are transferred to STEP hatchbox facilities or are used in classroom incubators. In addition, approximately 110,000 eyed eggs are transferred to the Whiskey Creek STEP facility on Netarts Bay for rearing to fingerling or smolt size. Details of the Whiskey Creek spring Chinook program are covered in the Whiskey Creek Hatchery Stock-34 Spring Chinook Hatchery and Genetic Management Plan (HGMP). The remaining fish are reared to smolt size at Trask Hatchery, Trask Pond, and Tuffy Creek Pond. From Trask Hatchery, approximately 63,000 fingerlings are transferred to the Tuffy Creek facility and 120,000 are transferred to Trask Pond. Trask Hatchery retains approximately 70,000 fingerlings. Up to 40,000 fingerlings from the Whiskey Creek Stock 34 Spring Chinook program are eventually transferred to Trask Pond and mixed with the Trask Hatchery Stock 34 fingerlings. Therefore, subsequent releases from Trask Pond into the Trask and Wilson rivers include a mix of Trask Hatchery and Whiskey Creek Hatchery Stock 34 spring Chinook.

Trask Hatchery volitionally releases ~70,000 smolts directly into the Trask River. In addition, ~120,000 Trask Pond smolts are transported and direct-released into the lower mainstem Trask River (usually at the Highway 101 boat ramp at RM 4.5). From Trask Hatchery, approximately 63,000 fingerlings are transferred to the Tuffy Creek facility (for eventual ~60,000 smolt release). Approximately 40,000 smolts from Trask Pond are also transported to the Wilson River either for direct release or acclimation at Hughey Creek acclimation pond located at ~RM 6.5 on the Wilson River. All fish transported from Trask Pond are a mix of Trask Hatchery (~120,000 smolts) and Whiskey Creek Hatchery (up to 40,000 smolts) Stock 34 spring Chinook. Spring Chinook smolts from the Tuffy Creek facility are generally released directly into the lower mainstem Wilson River (~60,000 released). The smolt releases into the Trask River and Wilson River were marked through 2009 with CWTs to allow assessment of the performance (see below).

The primary goal of this program is to provide hatchery spring Chinook adults for sports harvest in the ocean and freshwater. In addition, this program provides educational opportunities to students and encourages volunteer involvement from the public with natural resources through STEP activities.

**Trask R Release:** The majority of Trask stock smolts that are released into the Trask River are captured as adults in Oregon FW sport fisheries (Tables 15 and 16). During the previous ten brood years for which we have complete cohort data, an average of 660 adults (range 113-1,304) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled so harvest is calculated using punch card data and therefore is subject to considerable error. The number of hatchery spring Chinook that stray onto spawning grounds in the Trask and Wilson basins is considered to be approximately 50% based on recent survey information

Hatchery recoveries are likely an underestimate given the large number of fish that are released onsite.

**Wilson River release:** The majority (~68%) of Trask stock smolts that are released into the Wilson River are captured as adults in Oregon FW sport fisheries (Tables 17 and 18). The Alaska commercial fishery also accounts for ~19% of the harvest. During the previous ten brood years for which we have complete cohort data, an average of 238 adults (range 358-974) were caught in Oregon marine and FW fisheries. The FW fisheries in this basin are generally not sampled so harvest is calculated using punch card data and therefore is subject to considerable error. . The number of hatchery spring Chinook that stray onto spawning grounds in the Trask and Wilson basins is considered to be approximately 50% based on recent survey information.

#### **2.1.2.2 Nestucca Spring Chinook (Stock 47)**

Nestucca stock spring Chinook brood are collected, held, and spawned at Cedar Creek Hatchery. In some years, brood may also be collected by seining. Approximately 65,000 eggs may be transferred to the STEP program for use in streamside hatchboxes and classroom incubators. These fish are typically released as unfed fry. The remaining juveniles are reared to the smolt stage entirely at Cedar Creek Hatchery. Approximately 110,000 smolts are released from the hatchery. This group has been marked with a CWT to allow assessment of their performance.

The goal of this program is to provide hatchery spring Chinook adults for recreational harvest in freshwater and ocean fisheries. In addition, the STEP program provides educational opportunities to students and encourages volunteer involvement from the public.

**Three R Release:** The majority of Nestucca stock smolts that are released into the Nestucca Basin are captured as adults in Oregon FW sport fisheries (Tables 19 and 20). During the previous ten brood years for which we have complete cohort data, an average of 651 adults (range 152-1,338) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. The number of hatchery spring Chinook that stray onto spawning grounds in the Nestucca Basin is considered to be approximately 40% based on recent survey information.

**Table 15. Estimated number of Trask Hatchery adult hatchery spring Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |     |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|-----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA  | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 144298          | 39               | 0   | 0   | 49  | 0  | 21    | 67         | 0                | 89       | 135      | UNK             | 176     | 138    |
| 1995      | 54468           | 9                | 0   | 0   | 8   | 0  | 7     | 10         | 0                | 105      | 26       | UNK             | 122     | 113    |
| 1996      | 54227           | 9                | 0   | 2   | 10  | 0  | 6     | 15         | 0                | 129      | 19       | UNK             | 150     | 140    |
| 1997      | 38367           | 4                | 4   | 11  | 47  | 0  | 14    | 52         | 0                | 335      | 34       | UNK             | 401     | 382    |
| 1998      | 150875          | 198              | 226 | 97  | 144 | 0  | 70    | 596        | 0                | 596      | 172      | UNK             | 1262    | 741    |
| 1999      | 144799          | 163              | 247 | 166 | 385 | 0  | 90    | 871        | 0                | 728      | 439      | UNK             | 1689    | 1113   |
| 2000      | 147855          | 243              | 531 | 125 | 237 | 0  | 104   | 1031       | 0                | 1067     | 595      | UNK             | 2202    | 1304   |
| 2001      | 39984           | 15               | 22  | 9   | 15  | 0  | 0     | 60         | 0                | 1145     | 95       | UNK             | 1206    | 1160   |
| 2002      | 161224          | 183              | 241 | 61  | 173 | 0  | 77    | 582        | 0                | 766      | 747      | UNK             | 1424    | 939    |
| 2003      | 83724           | 0                | 4   | 9   | 0   | 0  | 0     | 12         | 0                | 572      | 37       | UNK             | 584     | 572    |
| Average   | 101982          | 86               | 128 | 48  | 107 | 0  | 39    | 330        | 0                | 553      | 230      | UNK             | 922     | 660    |

**Table 16. Distribution of harvest of Trask Hatchery adult hatchery spring Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 22    | 0  | 0  | 78 | 0  |
| 1995       | 7     | 0  | 0  | 93 | 0  |
| 1996       | 6     | 0  | 1  | 93 | 0  |
| 1997       | 1     | 1  | 3  | 95 | 0  |
| 1998       | 16    | 18 | 8  | 59 | 0  |
| 1999       | 10    | 15 | 10 | 66 | 0  |
| 2000       | 11    | 24 | 6  | 59 | 0  |
| 2001       | 1     | 2  | 1  | 96 | 0  |
| 2002       | 13    | 17 | 4  | 66 | 0  |
| 2003       | 0     | 1  | 1  | 98 | 0  |
| Average    | 9     | 8  | 3  | 80 | 0  |



**Table 17. Estimated number of Trask Hatchery adult hatchery spring Chinook released in the Wilson River that are caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |    |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 109083          | 26               | 0   | 0  | 18  | 0  | 12    | 31         | 0                | 43       | 79       | UNK             | 87      | 61     |
| 1995      | 199685          | 58               | 0   | 0  | 28  | 0  | 28    | 58         | 0                | 64       | 200      | UNK             | 149     | 92     |
| 1996      | 194552          | 21               | 27  | 0  | 19  | 0  | 0     | 66         | 0                | 67       | 98       | UNK             | 133     | 86     |
| 1997      | 206468          | 22               | 22  | 0  | 51  | 0  | 16    | 78         | 0                | 122      | 72       | UNK             | 216     | 173    |
| 1998      | 104138          | 94               | 33  | 5  | 65  | 0  | 39    | 158        | 0                | 201      | 120      | UNK             | 397     | 265    |
| 1999      | 101784          | 135              | 191 | 94 | 212 | 0  | 60    | 572        | 0                | 263      | 166      | UNK             | 894     | 474    |
| 2000      | 107560          | 102              | 265 | 81 | 140 | 0  | 0     | 588        | 0                | 273      | 229      | UNK             | 862     | 414    |
| 2001      |                 |                  |     |    |     |    |       |            |                  |          |          | UNK             |         |        |
| 2002      | 116388          | 136              | 347 | 68 | 124 | 0  | 130   | 545        | 0                | 207      | 553      | UNK             | 882     | 331    |
| 2003      | 165909          | 21               | 36  | 0  | 14  | 0  | 0     | 72         | 0                | 229      | 226      | UNK             | 300     | 243    |
| Average   | 145063          | 68               | 102 | 28 | 75  | 0  | 32    | 241        | 0                | 163      | 194      | UNK             | 436     | 238    |

**Table 18. Distribution of harvest of Trask Hatchery adult hatchery spring Chinook released in the Wilson River among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 30    | 0  | 0  | 70 | 0  |
| 1995       | 39    | 0  | 0  | 61 | 0  |
| 1996       | 15    | 20 | 0  | 64 | 0  |
| 1997       | 10    | 10 | 0  | 80 | 0  |
| 1998       | 24    | 8  | 1  | 67 | 0  |
| 1999       | 15    | 21 | 11 | 53 | 0  |
| 2000       | 12    | 31 | 9  | 48 | 0  |
| 2001       |       |    |    |    |    |
| 2002       | 15    | 39 | 8  | 38 | 0  |
| 2003       | 7     | 12 | 0  | 81 | 0  |
| Average    | 19    | 16 | 3  | 62 | 0  |

**Table 19. Estimated number of Cedar Creek Hatchery adult hatchery spring Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |     |     |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|-----|-----|-----|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC  | WA  | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1994      | 126327          | 22               | 0   | 14  | 21  | 0  | 15    | 42         | 0                | 155      | 164      | UNK             | 212     | 176    |
| 1995      | 112312          | 85               | 0   | 27  | 24  | 0  | 24    | 111        | 0                | 128      | 145      | UNK             | 263     | 152    |
| 1996      | 120651          | 107              | 31  | 46  | 23  | 0  | 22    | 186        | 0                | 197      | 189      | UNK             | 405     | 220    |
| 1997      | 122222          | 21               | 64  | 8   | 24  | 0  | 21    | 97         | 0                | 324      | 104      | UNK             | 441     | 348    |
| 1998      | 119800          | 63               | 238 | 56  | 164 | 0  | 30    | 491        | 0                | 611      | 62       | UNK             | 1132    | 775    |
| 1999      | 113401          | 68               | 557 | 196 | 168 | 0  | 39    | 949        | 0                | 881      | 117      | UNK             | 1869    | 1048   |
| 2000      | 119664          | 54               | 430 | 69  | 211 | 0  | 99    | 664        | 0                | 1127     | 19       | UNK             | 1890    | 1338   |
| 2001      | 103969          | 122              | 136 | 15  | 76  | 0  | 13    | 336        | 0                | 899      | 31       | UNK             | 1248    | 975    |
| 2002      | 110467          | 109              | 97  | 37  | 96  | 0  | 28    | 311        | 0                | 847      | 38       | UNK             | 1186    | 943    |
| 2003      | 115206          | 8                | 12  | 8   | 0   | 0  | 8     | 21         | 0                | 536      | 10       | UNK             | 564     | 536    |
| Average   | 116402          | 66               | 156 | 48  | 81  | 0  | 30    | 321        | 0                | 571      | 88       | UNK             | 921     | 651    |

**Table 20. Distribution of harvest of Cedar Creek Hatchery adult hatchery spring Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 10    | 0  | 6  | 83 | 0  |
| 1995       | 32    | 0  | 10 | 58 | 0  |
| 1996       | 27    | 8  | 11 | 54 | 0  |
| 1997       | 5     | 14 | 2  | 79 | 0  |
| 1998       | 6     | 21 | 5  | 68 | 0  |
| 1999       | 4     | 30 | 10 | 56 | 0  |
| 2000       | 3     | 23 | 4  | 71 | 0  |
| 2001       | 10    | 11 | 1  | 78 | 0  |
| 2002       | 9     | 8  | 3  | 80 | 0  |
| 2003       | 1     | 2  | 1  | 95 | 0  |
| Average    | 11    | 12 | 5  | 72 | 0  |

### **2.1.2.3 North Fork Umpqua River Spring Chinook (Stock 55)**

North Fork Umpqua stock spring Chinook brood are collected at Winchester Dam trap and as swim-ins to Rock Creek Fish Hatchery. The adults are spawned at Rock Creek Hatchery. The smolts are released volitionally from Rock Creek Hatchery's rearing ponds into Rock Creek during October and February. Both release groups have a CWT group to allow assessment of post-release performance (see below).

The goal of this program is to provide Chinook for the Umpqua River and North Umpqua River recreational fisheries, plus commercial and sport fisheries in the ocean. Fish which are not harvested are allowed to spawn naturally with naturally producing spring Chinook in the North Umpqua. To accomplish harvest and escapement goals, the ODFW has a goal of 4,000 to 7,000 spring Chinook adults annually passing Winchester Dam. To reach this goal, the program annually releases approximately 342,000 smolts.

**Rock Cr Release:** The majority of North Fork Umpqua stock smolts that are released into the North Fork Umpqua River are captured as adults in Oregon FW sport fisheries (Tables 21 and 22). During the previous ten brood years for which we have complete cohort data, an average of 2,953 adults (range 883-6,404) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. Hatchery strays are monitored on spawning grounds in the upper Mainstem North Umpqua between Calf Creek and Soda Springs Dam. The stray rates have ranged from 16.4 to 8.9 from 2004 – 2009. In 2004 the hatchery program was decreased from 420,000 smolts to 340,000. Consequently hatchery strays since 2008 have been declining. Adult passage is also monitored at Winchester Dam. This count, less the upriver harvest, provides a good estimate of the number wild and hatchery escapement. Many of the hatchery chinook return to Rock Creek. In the future Rock Creek will have a new fish ladder that would allow sorting of hatchery fish if desired.

**Table 21. Estimated number of Umpqua Basin adult hatchery spring Chinook caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |     |     |      |     |       |            | FW Recoveries    |          |                               |  | total   | Oregon |
|-----------|-----------------|------------------|-----|-----|------|-----|-------|------------|------------------|----------|-------------------------------|--|---------|--------|
| Broodyear | Number released | AK               | BC  | WA  | OR   | CA  | sport | commercial | Columbia gillnet | FW sport | Hatchery and Spawning grounds |  | harvest | catch  |
| 1994      | 298844          | 32               | 0   | 10  | 483  | 57  | 80    | 503        | 0                | 822      | 3012                          |  | 1405    | 1305   |
| 1995      | 308470          | 78               | 36  | 9   | 74   | 38  | 0     | 236        | 0                | 809      | 4862                          |  | 1045    | 883    |
| 1996      | 247660          | 0                | 0   | 107 | 312  | 48  | 73    | 394        | 0                | 1226     | 8885                          |  | 1693    | 1537   |
| 1997      | 404542          | 0                | 93  | 108 | 1821 | 53  | 151   | 1923       | 53               | 1873     | 13409                         |  | 4000    | 3747   |
| 1998      | 399938          | 22               | 235 | 425 | 3165 | 301 | 569   | 3580       | 0                | 3239     | 15622                         |  | 7387    | 6404   |
| 1999      | 424453          | 16               | 143 | 257 | 3376 | 687 | 454   | 4026       | 42               | 3498     | 12277                         |  | 8019    | 6915   |
| 2000      | 144882          | 63               | 121 | 147 | 1272 | 780 | 209   | 2174       | 0                | 2318     | 9339                          |  | 4701    | 3590   |
| 2001      | 400362          | 30               | 123 | 78  | 1052 | 66  | 71    | 1277       | 0                | 1607     | 5315                          |  | 2955    | 2659   |
| 2002      | 265244          | 44               | 277 | 104 | 297  | 0   | 209   | 514        | 0                | 1005     | 895                           |  | 1728    | 1302   |
| 2003      | 267924          | 0                | 310 | 398 | 330  | 148 | 97    | 1090       | 0                | 860      | 0                             |  | 2047    | 1191   |
| Average   | 316232          | 29               | 134 | 164 | 1218 | 218 | 191   | 1572       | 9                | 1726     | 7362                          |  | 3498    | 2953   |

**Table 22. Distribution of harvest of Umpqua Basin adult hatchery spring Chinook among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1994       | 2     | 0  | 1  | 93 | 4  |
| 1995       | 7     | 3  | 1  | 85 | 4  |
| 1996       | 0     | 0  | 6  | 91 | 3  |
| 1997       | 0     | 2  | 3  | 94 | 1  |
| 1998       | 0     | 3  | 6  | 87 | 4  |
| 1999       | 0     | 2  | 3  | 86 | 9  |
| 2000       | 1     | 3  | 3  | 76 | 17 |
| 2001       | 1     | 4  | 3  | 90 | 2  |
| 2002       | 3     | 16 | 6  | 75 | 0  |
| 2003       | 0     | 15 | 19 | 58 | 7  |
| Average    | 2     | 5  | 5  | 83 | 5  |

### **2.1.3 ODFW Coho Programs**

#### **2.1.3.1 Nehalem/Fishhawk Coho (Stock 32/Stock 99)**

Nehalem/Fishhawk stock coho brood are collected, held, and spawned at Nehalem Hatchery. Progeny are reared entirely at this facility until the smolt stage. The current goal is to release 100,000 smolts from the hatchery. The smolt release has been marked with CWTs to allow assessment of their performance (see below), but due to budget constraints this marking has been discontinued.

The purpose of this program is to provide adult hatchery coho for harvest in ocean fisheries and in Nehalem Basin freshwater fisheries.

**North Fork Nehalem River Release:** The majority of North Fork Nehalem/Fishhawk stock smolts that are released into the North Fork Nehalem River are captured in Oregon FW sport fisheries (Tables 23 and 24). During the previous ten brood years for which we have complete cohort data, an average of 530 adults (range 80-1,671) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. There is no information regarding the number of hatchery fish that stray onto spawning grounds.

#### **2.1.3.2 Trask River Coho (Stock 34)**

Trask stock coho brood are collected, held, and spawned at Trask River Hatchery. Incubation and early rearing occurs at Trask River Hatchery. Approximately 135,000 to 140,000 fingerlings are transferred from Trask River Hatchery to Nehalem Hatchery for rearing to smolt size. Smolts are differentially marked to differentiate Trask stock from Nehalem stock before being transferred back to Trask River Hatchery and acclimated for up to a month before being direct released from the hatchery pond.

The goal of this program is to provide hatchery fish for consumptive sport and commercial fisheries in the waters of Oregon in a manner that minimizes the risk of adverse effects to listed wild populations.

**Trask R Release:** The majority of Trask stock smolts that are released into the Trask River are captured as adults in Oregon FW sport and marine fisheries (Tables 25 and 26). During the previous ten brood years for which we have complete cohort data, an average of 674 adults (range 98-2,372) were caught in Oregon marine and FW fisheries. The FW fisheries in this system are not sampled, so harvest is calculated using punch card data and therefore is subject to considerable error. There is no information regarding the number of hatchery fish that stray onto spawning grounds.

**Table 23. Estimated number of North Fork Nehalem Hatchery adult coho caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |    |     |     |    |        |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|----|-----|-----|----|--------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC | WA  | OR  | CA | spor t | commerca l | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1995      | 576156          | 0                | 0  | 0   | 0   | 68 | 68     | 0          | 0                | 161      | 1621     | UNK             | 228     | 161    |
| 1996      | 145229          | 0                | 0  | 18  | 27  | 27 | 72     | 0          | 0                | 394      | 1528     | UNK             | 466     | 422    |
| 1997      | 160758          | 0                | 0  | 0   | 29  | 0  | 18     | 10         | 0                | 51       | 391      | UNK             | 80      | 80     |
| 1998      | 157466          | 0                | 0  | 147 | 120 | 14 | 262    | 20         | 13               | 1539     | 4140     | UNK             | 1832    | 1671   |
| 1999      | 153669          | 0                | 0  | 126 | 185 | 16 | 328    | 0          | 0                | 626      | 2200     | UNK             | 954     | 811    |
| 2000      | 255803          | 0                | 0  | 258 | 467 | 0  | 686    | 40         | 0                | 660      | 1652     | UNK             | 1386    | 1128   |
| 2001      | 101704          | 0                | 0  | 141 | 229 | 18 | 347    | 41         | 0                | 357      | 1438     | UNK             | 745     | 586    |
| 2002      | 100652          | 0                | 0  | 29  | 24  | 0  | 36     | 18         | 4                | 217      | 1407     | UNK             | 275     | 245    |
| 2003      | 103460          | 0                | 21 | 36  | 15  | 15 | 86     | 0          | 0                | 124      | 552      | UNK             | 210     | 138    |
| 2004      | 106229          | 0                | 0  | 25  | 8   | 11 | 44     | 0          | 0                | 47       | 167      | UNK             | 92      | 56     |
| Average   | 186113          | 0                | 2  | 78  | 111 | 17 | 195    | 13         | 2                | 418      | 1510     | UNK             | 627     | 530    |

**Table 24. Distribution of harvest of North Fork Nehalem Hatchery adult coho among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |     |    |
|------------|-------|----|----|-----|----|
|            | AK    | BC | WA | OR  | CA |
| 1995       | 0     | 0  | 0  | 70  | 30 |
| 1996       | 0     | 0  | 4  | 90  | 6  |
| 1997       | 0     | 0  | 0  | 100 | 0  |
| 1998       | 0     | 0  | 8  | 91  | 1  |
| 1999       | 0     | 0  | 13 | 85  | 2  |
| 2000       | 0     | 0  | 19 | 81  | 0  |
| 2001       | 0     | 0  | 19 | 79  | 2  |
| 2002       | 0     | 0  | 11 | 89  | 0  |
| 2003       | 0     | 10 | 17 | 66  | 7  |
| 2004       | 0     | 0  | 28 | 61  | 11 |
| Average    | 0     | 1  | 12 | 81  | 6  |

**Table 25. Estimated number of Trask Hatchery adult coho caught in ocean and freshwater (FW) fisheries, returning to hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |    |     |      |    |       |            | FW Recoveries    |          |          |                 | total   | Oregon |
|-----------|-----------------|------------------|----|-----|------|----|-------|------------|------------------|----------|----------|-----------------|---------|--------|
| Broodyear | Number released | AK               | BC | WA  | OR   | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery | Spawning Ground | harvest | catch  |
| 1995      | 144533          | 0                | 0  | 64  | 54   | 0  | 110   | 8          | 0                | 1        | 1624     | UNK             | 119     | 54     |
| 1996      | 212525          | 32               | 0  | 96  | 133  | 0  | 229   | 32         | 0                | 5        | 4431     | UNK             | 266     | 138    |
| 1997      | 189230          | 0                | 0  | 106 | 426  | 0  | 437   | 95         | 0                | 122      | 4671     | UNK             | 653     | 547    |
| 1998      | 196385          | 0                | 0  | 508 | 1008 | 61 | 1492  | 85         | 0                | 1364     | 19728    | UNK             | 2941    | 2372   |
| 1999      | 194634          | 0                | 0  | 320 | 268  | 45 | 633   | 0          | 0                | 903      | 11397    | UNK             | 1535    | 1170   |
| 2000      | 201749          | 0                | 0  | 685 | 857  | 0  | 1508  | 34         | 0                | 659      | 5856     | UNK             | 2201    | 1516   |
| 2001      | 96748           | 0                | 0  | 151 | 215  | 6  | 346   | 26         | 0                | 328      | 1776     | UNK             | 701     | 543    |
| 2002      | 100382          | 0                | 0  | 17  | 7    | 0  | 24    | 0          | 0                | 148      | 1591     | UNK             | 172     | 155    |
| 2003      | 103000          | 0                | 0  | 48  | 60   | 0  | 96    | 12         | 0                | 89       | 1220     | UNK             | 197     | 150    |
| 2004      | 94020           | 0                | 0  | 3   | 20   | 8  | 27    | 3          | 0                | 79       | 156      | UNK             | 109     | 98     |
| Average   | 153321          | 3                | 0  | 200 | 305  | 12 | 490   | 29         | 0                | 370      | 5245     | UNK             | 889     | 674    |

**Table 26. Distribution of harvest of Trask Hatchery adult coho among the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1995       | 0     | 0  | 54 | 46 | 0  |
| 1996       | 12    | 0  | 36 | 52 | 0  |
| 1997       | 0     | 0  | 16 | 84 | 0  |
| 1998       | 0     | 0  | 17 | 81 | 2  |
| 1999       | 0     | 0  | 21 | 76 | 3  |
| 2000       | 0     | 0  | 31 | 69 | 0  |
| 2001       | 0     | 0  | 22 | 78 | 1  |
| 2002       | 0     | 0  | 10 | 90 | 0  |
| 2003       | 0     | 0  | 24 | 76 | 0  |
| 2004       | 0     | 0  | 3  | 91 | 7  |
| Average    | 1     | 0  | 23 | 74 | 1  |

### **2.1.3.3 North Fork Umpqua River Coho (Stocks 55)**

The North Umpqua coho (stock 55) was discontinued in 2005, except for a mitigation agreement with PacifiCorps. This agreement is for 80,000 coho eggs for an artificial egg deployment and habitat restoration research study. The brood for this program are collected from Winchester Dam. This program will require 80,000 eggs from BY 2009 through BY 2011.

### **South Umpqua River Coho (Stock 18)**

The South Umpqua coho program is part of a mitigation program with Douglas County. The goal of this program is to release 60,000 smolts annually for commercial and recreational fishing. The brood are collected at the Happy Valley Trap (RM 18 S. Ump.) and at a fish trap at the base of Galesville Dam. Rock Creek Hatchery rears the smolts until they are transferred to an acclimation site at the base of Galesville Dam. According to spawning ground surveys conducted by Corvallis research, hatchery strays have declined from 11.3% to 7.1% from 2000 to 2009. The Umpqua has a hatchery-fish only harvest regulation.



**Table 27. Estimated number of Umpqua Basin adult coho caught in ocean and freshwater (FW) fisheries, returning to the hatchery, or straying to spawning grounds. Estimates are based on CWT recoveries.**

|           |                 | Ocean Recoveries |    |     |     |    |       |            | FW Recoveries    |          |                               |  | total   | Oregon |
|-----------|-----------------|------------------|----|-----|-----|----|-------|------------|------------------|----------|-------------------------------|--|---------|--------|
| Broodyear | Number released | AK               | BC | WA  | OR  | CA | sport | commercial | Columbia gillnet | FW sport | Hatchery and spawning grounds |  | harvest | catch  |
| 1995      | 104773          | 0                | 0  | 15  | 13  | 8  | 36    | 0          | 0                | 877      | 4269                          |  | 913     | 890    |
| 1996      | 143565          | 0                | 0  | 26  | 69  | 29 | 115   | 7          | 0                | 686      | 3566                          |  | 809     | 755    |
| 1997      | 114138          | 0                | 0  | 40  | 221 | 0  | 247   | 14         | 11               | 1406     | 9572                          |  | 1678    | 1637   |
| 1998      | 117703          | 0                | 0  | 78  | 278 | 24 | 368   | 12         | 0                | 13756    | 16142                         |  | 14136   | 14034  |
| 1999      | 50219           | 0                | 0  | 20  | 31  | 0  | 52    | 0          | 0                | 1438     | 4349                          |  | 1490    | 1470   |
| 2000      | 115178          | 0                | 0  | 144 | 867 | 0  | 968   | 43         | 0                | 4260     | 13535                         |  | 5271    | 5127   |
| 2001      | 121797          | 10               | 0  | 257 | 923 | 30 | 1178  | 42         | 22               | 2093     | 7056                          |  | 3335    | 3038   |
| 2002      | 110044          | 0                | 77 | 47  | 39  | 43 | 207   | 0          | 0                | 1576     | 9316                          |  | 1783    | 1616   |
| 2003      | 111506          | 0                | 0  | 50  | 68  | 30 | 105   | 43         | 0                | 2420     | 7040                          |  | 2568    | 2488   |
| 2004      | 68027           | 0                | 0  | 32  | 113 | 0  | 131   | 14         | 0                | 1077     | 2746                          |  | 1222    | 1190   |
| Average   | 105695          | 1                | 8  | 71  | 262 | 16 | 341   | 18         | 3                | 2959     | 7759                          |  | 3320    | 3224   |

**Table 28. Distribution of harvest of Umpqua Basin adult coho in the four northwest states (Alaska, Washington, Oregon and California) and Canada (BC). Values represent the % of the total harvest caught in the respective regions.**

| Brood Year | State |    |    |    |    |
|------------|-------|----|----|----|----|
|            | AK    | BC | WA | OR | CA |
| 1995       | 0     | 0  | 2  | 97 | 1  |
| 1996       | 0     | 0  | 3  | 93 | 4  |
| 1997       | 0     | 0  | 2  | 98 | 0  |
| 1998       | 0     | 0  | 1  | 99 | 0  |
| 1999       | 0     | 0  | 1  | 99 | 0  |
| 2000       | 0     | 0  | 3  | 97 | 0  |
| 2001       | 0     | 0  | 8  | 91 | 1  |
| 2002       | 0     | 4  | 3  | 91 | 2  |
| 2003       | 0     | 0  | 2  | 97 | 1  |
| 2004       | 0     | 0  | 3  | 97 | 0  |
| Average    | 0     | 0  | 3  | 96 | 1  |

#### **2.1.4 ODFW Winter Steelhead Programs**

**Note: There are no ocean fisheries for steelhead, therefore, we only report on freshwater catch in Oregon rivers and estuaries. In all instances the FW fisheries are not regularly sampled, so estimates are derived from punch cards. Thus, harvest estimates are subject to a high degree of uncertainty. In addition, there is no regular assessment that provides information on the number of hatchery winter steelhead that stray**

##### **2.1.4.1 Nehalem Winter Steelhead (Stock 32)**

Nehalem stock winter steelhead brood are collected, held, and spawned at Nehalem Hatchery. The progeny are also reared entirely onsite. Currently, approximately 90,000 smolts are released into the North Fork Nehalem River from the hatchery and 40,000 are released into the Necanicum River.

The primary goal is to provide hatchery steelhead adults for recreational harvest in these basins. In addition, the program educates students about salmonid fish biology and their habitat requirements via the STEP program.

**North Fork Nehalem River and Necanicum River releases:** During the past 10 years, the Nehalem winter steelhead program accounts for an average of 1,092 and 406 of the winter steelhead harvested in the Nehalem and Necanicum basins, respectively. Prior to the 2009 brood year, Nehalem hatchery utilized both stock 32 and stock 99 winter steelhead. Current production utilizes only stock 32.

##### **2.1.4.2 Nestucca Winter Steelhead (Stock 47 and 47W)**

Beginning in November, Nestucca hatchery stock (47) adults return to the Three Rivers trap and are collected for broodstock and held until spawning in early January. Wild Nestucca broodstock (47W) adults are collected by angling beginning in mid December and running through April. Some wild stock fish are trapped in the Three Rivers trap. Currently these fish are passed above the weir to spawn naturally.

Stock 47 adults are spawned at Cedar Creek Hatchery in January and eggs are incubated onsite. Approximately 85,000 stock 47 juveniles are transferred to Tuffy Creek Rearing Pond, (Trask Hatchery satellite facility), after marking at Cedar Creek. The performance of these fish is discussed in the following section.

Stock 47W adults are live-spawned from throughout the collection period as they become ripe. All spawning, incubation and rearing take place at Cedar Creek Hatchery. The stock 47W program began with 2002 brood year.

**Table 29. Release numbers, FW harvest estimates, and hatchery returns for Nehalem winter steelhead (stock 32 and 99). Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Nehalem Smolt<br>Release | Necanicum Smolt<br>Release | 2-salt<br>Return<br>Year | Nehalem<br>FW<br>Sport * | Necanicum<br>FW<br>Sport * | Nehalem<br>Hatchery<br>Return ** | SGS  |
|----------------|--------------------------|----------------------------|--------------------------|--------------------------|----------------------------|----------------------------------|------|
| 1996           | 92,747                   | 45,092                     | 1998-99                  | 1,044                    | 352                        | 1,343                            | n.a. |
| 1997           | 94,909                   | 40,005                     | 1999-00                  | 1,249                    | 439                        | 1,060                            | n.a. |
| 1998           | 87,215                   | 39,043                     | 2000-01                  | 1,009                    | 496                        | 1,249                            | n.a. |
| 1999           | 99,725                   | 39,991                     | 2001-02                  | 1,809                    | 734                        | 2,762                            | n.a. |
| 2000           | 98,195                   | 40,062                     | 2002-03                  | 935                      | 425                        | 1,299                            | n.a. |
| 2001           | 98,911                   | 39,992                     | 2003-04                  | 1,518                    | 596                        | 2,009                            | n.a. |
| 2002           | 89,608                   | 40,016                     | 2004-05                  | 769                      | 427                        | 1,750                            | n.a. |
| 2003           | 96,383                   | 39,998                     | 2005-06                  | 844                      | 313                        | 2,251                            | n.a. |
| 2004           | 93,959                   | 40,001                     | 2006-07                  | 1,117                    | 218                        | 1,920                            | n.a. |
| 2005           | 97,122                   | 39,992                     | 2007-08                  | 629                      | 57                         | 1,393                            | n.a. |
| <b>Average</b> | <b>94,877</b>            | <b>40,419</b>              |                          | <b>1,092</b>             | <b>406</b>                 | <b>1,704</b>                     |      |

\* = Nehalem Basin Catch, based on punch card returns. The 1992-93 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

All releases in the Nestucca basin currently are a mix of 47 and 47W stock winter steelhead. All releases in the Wilson are a mix of 47 stock and 121W stock, (Wilson wild broodstock); all Kilchis releases are of the 47 stock. The primary goal is to provide hatchery steelhead adults for sports harvest in the Nestucca, Kilchis, and Wilson river basins.

**Nestucca River releases:** During the past 10 years, the Nestucca winter steelhead program has accounted for an average of 1,509 of the winter steelhead harvested in the Nestucca basin based on angler punch card returns.

**Table 30. Release numbers, FW harvest estimates, and hatchery returns for Cedar Creek Hatchery winter steelhead from stock 47 and 47W (began with 2002 brood year). Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                       |      |
|----------------|------------------|-----------------------|------------------------------------------------|-----------------------|------|
|                |                  |                       | FW<br>Sport *                                  | Hatchery<br>Return ** | SGS  |
| 1996           | 99,883           | 1998-99               | 1,148                                          | 2,323                 | n.a. |
| 1997           | 110,601          | 1999-00               | 1,285                                          | 1,385                 | n.a. |
| 1998           | 106,254          | 2000-01               | 1,537                                          | 3,112                 | n.a. |
| 1999           | 109,043          | 2001-02               | 2,281                                          | 5,164                 | n.a. |
| 2000           | 121,977          | 2002-03               | 1,328                                          | 2,386                 | n.a. |
| 2001           | 116,332          | 2003-04               | 1,973                                          | 2,169                 | n.a. |
| 2002           | 100,768          | 2004-05               | 1,155                                          | 920                   | n.a. |
| 2003           | 94,875           | 2005-06               | 1,514                                          | 749                   | n.a. |
| 2004           | 118,647          | 2006-07               | 1,657                                          | 282                   | n.a. |
| 2005           | 95,906           | 2007-08               | 1,208                                          | 273                   | n.a. |
| <b>Average</b> | <b>107,429</b>   |                       | <b>1,509</b>                                   | <b>1,876</b>          |      |

\* = Nestucca Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

#### **2.1.4.3 Nestucca (Stock 47) and Wilson (Stock 121W) Winter Steelhead (Tillamook Bay Releases)**

Nestucca 47 stock: Beginning in November, Nestucca hatchery stock (47) adults return to the Three Rivers trap and are collected for broodstock and held until spawning in early January. Stock 47 adults are spawned at Cedar Creek Hatchery in January and eggs are incubated onsite. Approximately 85,000 stock 47 juveniles are transferred to Tuffy Creek Rearing Pond, (Trask Hatchery satellite facility on the South Fork Wilson River), after marking at Cedar Creek.

Wilson (121W) stock: Most of the wild adult steelhead collected for broodstock are caught by anglers who have signed up to participate in the program. However, adults captured at the South Fork Wilson River trap or Trask Hatchery may also be used as broodstock. The adults are spawned at Trask Hatchery and the progeny are incubated and reared onsite. Smolts are acclimated and volitionally released at the Hughey Creek acclimation facility on the Wilson River (RM 7.0). Smolts are also direct-released into the Wilson River up to RM 27.

All winter steelhead releases in the Wilson are a mix of 47 stock and 121W stock, (Wilson wild broodstock); all Kilchis releases are of the 47 stock.

Hatchery winter steelhead smolts are released in the Wilson River to provide adults for freshwater harvest in the mark-select fishery. The goal of the 121W program is to use a locally-adapted wild winter steelhead broodstock source. This stock has been used to partially replace releases of stock 47. Stock 121W are late-returning/late-spawning wild steelhead whereas the historical hatchery winter steelhead (Stock 047) is an early-returning run. Use of in-basin stock was meant to lessen overall risk to the existing wild population. It also is in line with the agency's intention to move away from the use of out-of-basin stocks in hatchery programs.

**Wilson and Kilchis River releases:** During the past 10 years, the Nestucca/Wilson winter steelhead program has accounted for an average of 2,109 of the winter steelhead harvested in the Tillamook basin.

**Table 31. Release numbers, FW harvest estimates, and hatchery returns for Nestucca/Wilson stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | (47)<br>Smolt<br>Release | (121)<br>Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                |      |
|----------------|--------------------------|---------------------------|--------------------------|------------------------------------------------|----------------|------|
|                |                          |                           |                          | FW<br>Sport*                                   | Hatchery<br>** | SGS  |
| 1996           | 128,721                  |                           | 1998-99                  | 1,362                                          | n.a.           | n.a. |
| 1997           | 111,114                  | 41,739                    | 1999-00                  | 1,862                                          | n.a.           | n.a. |
| 1998           | 106,778                  | 20,505                    | 2000-01                  | 1,601                                          | n.a.           | n.a. |
| 1999           | 110,148                  | 50,254                    | 2001-02                  | 2,809                                          | n.a.           | n.a. |
| 2000           | 137,519                  | 34,070                    | 2002-03                  | 2,207                                          | n.a.           | n.a. |
| 2001           | 117,216                  | 46,989                    | 2003-04                  | 2,268                                          | n.a.           | n.a. |
| 2002           | 82,548                   | 29,033                    | 2004-05                  | 1,318                                          | n.a.           | n.a. |
| 2003           | 78,755                   | 45,904                    | 2005-06                  | 1,809                                          | n.a.           | n.a. |
| 2004           | 34,473                   | 67,990                    | 2006-07                  | 2,143                                          | n.a.           | n.a. |
| 2005           | 80,373                   | 79,554                    | 2007-08                  | 3,710                                          | n.a.           | n.a. |
| <b>Average</b> | <b>98,765</b>            | <b>46,226</b>             |                          | <b>2,109</b>                                   |                |      |

\* = Tillamook Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

#### 2.1.4.4 Siletz Wild Winter Steelhead (Stock 33W)

The Siletz wild winter steelhead brood are collected from the Siletz Falls and Palmer Creek traps and by anglers, then transported to Alsea Hatchery, where they are held, spawned, and reared to the smolt stage. The smolts are then transferred to a facility on Palmer Creek for acclimation and volitional release.

The goal of this program is to provide for an average annual angler harvest of 1,500 hatchery winter steelhead in the Siletz basin, while minimizing interactions with wild fish.

**Siletz River release:** During the past 10 years, the Siletz wild winter steelhead program has accounted for an average of 1,908 of the winter steelhead harvested in the Siletz basin. Recoveries of adult winter steelhead at the Schooner Cr Trap suggest that stray rates in that tributary are relatively low for fish released up-river into the Siletz (Table 33).

**Table 32. Release numbers, FW harvest estimates, and hatchery returns for Siletz wild stock winter steelhead. There is limited information on stray rates from spawning surveys and trap data.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                   |      |
|----------------|------------------|--------------------------|------------------------------------------------|-------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Siletz<br>Trap ** | SGS  |
| 1996           | 55,133           | 1998-99                  | 1,547                                          | 495               | n.a. |
| 1997           | 52,599           | 1999-00                  | 1,389                                          | 361               | n.a. |
| 1998           | 50,124           | 2000-01                  | 1,676                                          | 482               | n.a. |
| 1999           | 56,622           | 2001-02                  | 2,462                                          | 541               | n.a. |
| 2000           | 56,259           | 2002-03                  | 1,417                                          | 528               | n.a. |
| 2001           | 53,280           | 2003-04                  | 2,442                                          | 528               | n.a. |
| 2002           | 59,400           | 2004-05                  | 1,890                                          | 753               | n.a. |
| 2003           | 28,554           | 2005-06                  | 2,323                                          | 561               | n.a. |
| 2004           | 55,629           | 2006-07                  | 1,884                                          | 348               | n.a. |
| 2005           | 54,431           | 2007-08                  | 2,053                                          | 8                 | n.a. |
| <b>Average</b> | <b>52,203</b>    |                          | <b>1,908</b>                                   | <b>461</b>        |      |

\* = Siletz Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

**Table 33. Numbers of adult winter steelhead caught in Schooner Creek Trap in the Siletz Basin. Out of basin marks refer to hatchery fish that have a fin clip not applied to fish released into the Siletz Basin (e.g. Ad clip only).**

| year | site        | out of basin<br>mark | in basin<br>mark | wild fish | Total Number | % stray |
|------|-------------|----------------------|------------------|-----------|--------------|---------|
| 2009 | Schooner Cr | 5                    | 0                | 61        | 66           | 7.58%   |
| 2008 | Schooner Cr | 0                    | 1                | 10        | 11           | 9.09%   |
| 2007 | Schooner Cr | 1                    | 4                | 28        | 33           | 15.15%  |
| 2006 | Schooner Cr | 11                   | 4                | 19        | 34           | 44.12%  |
| 2005 | Schooner Cr |                      |                  |           |              |         |
| 2004 | Schooner Cr | 1                    | 0                | 41        | 42           | 2.38%   |
| 2003 | Schooner Cr | 26                   | 1                | 45        | 72           | 37.50%  |
| 2002 | Schooner Cr | 34                   | 0                | 71        | 105          | 32.38%  |
| 2001 | Schooner Cr | 21                   | 1                | 52        | 74           | 29.73%  |

#### **2.1.4.5 Alsea Winter Steelhead (Stock 43 and 43W)**

Traditional (43) and Wild (43W) Alsea stock winter steelhead are collected at the Alsea Hatchery. In addition, 43W brood are collected by anglers and transported to the hatchery. All fish are spawned, incubated, and reared onsite. Smolts are released volitionally from the hatchery in early March.

The goal of the Alsea smolt release group is to provide for an average annual angler harvest of 2,400 hatchery winter steelhead in the Alsea Basin, while minimizing interactions with wild fish. The goal for the Yaquina smolt release group is to provide hatchery fish for harvest in the Yaquina Basin while minimizing interactions with wild fish.

**Big Elk River release:** During the past 10 years, the Alsea traditional wild winter steelhead program has accounted for an average of 201 of the winter steelhead harvested in the Yaquina basin. . Adult fish are counted at a trap site on Mill Creek, a tributary of the Yaquina R near tidewater. The percentage of hatchery fish at this site has ranged from 9-20% during the past decade. Of these, 0-80% have marks that were not applied to fish released in the Yaquina Basin suggesting that out of basin fish are be straying into the basin.

**Table 34. Release numbers, FW harvest estimates, and hatchery returns for Alsea stock winter steelhead released in Big Elk River. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                     |      |
|----------------|------------------|--------------------------|------------------------------------------------|---------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Hatchery<br>Trap ** | SGS  |
| 1996           | 19,650           | 1998-99                  | 192                                            | n.a.                | n.a. |
| 1997           | 18,899           | 1999-00                  | 251                                            | n.a.                | n.a. |
| 1998           | 25,607           | 2000-01                  | 211                                            | n.a.                | n.a. |
| 1999           | 20,918           | 2001-02                  | 335                                            | n.a.                | n.a. |
| 2000           | 19,889           | 2002-03                  | 171                                            | n.a.                | n.a. |
| 2001           | 21,692           | 2003-04                  | 269                                            | n.a.                | n.a. |
| 2002           | 19,547           | 2004-05                  | 147                                            | n.a.                | n.a. |
| 2003           | 14,894           | 2005-06                  | 128                                            | n.a.                | n.a. |
| 2004           | 22,261           | 2006-07                  | 153                                            | n.a.                | n.a. |
| 2005           | 21,973           | 2007-08                  | 156                                            | n.a.                | n.a. |
| <b>Average</b> | <b>20,533</b>    |                          | <b>201</b>                                     |                     |      |

\* = Yaquina Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

**Alsea River release:** During the past 10 years, the Alsea traditional and wild winter steelhead program has accounted for an average of 2,325 of the winter steelhead harvested in the Alsea basin (Table 35). Although there is no comprehensive assessment of stray rates for this program, winter steelhead are collected at three trap sites located downriver of the release site at Alsea Hatchery: Cascade Creek, Fall Creek, and Bohannon Falls. Since the program was modified to release all fish onsite at Alsea Hatchery, the majority of hatchery steelhead caught at these trap sites are of fish that were released into other basins (return years 2005/06 on Table 36). The total number of hatchery strays (in and out of basin) varies among years and ranges from 5-57% of the wild fish caught in the trap (note small sample sizes). In addition, a number of Ad-clipped (out-of-basin mark) winter steelhead are captured in the two traps at the Alsea Hatchery. The origin of these fish is currently unknown though genetic information collected from fish recovered at the Fall Creek Trap site in 2008 suggests that ~50% of those fish were of Alsea origin fish.



**Table 35. Release numbers, FW harvest estimates, and hatchery returns for Alsea stock winter steelhead released in the Alsea River. There is limited information on stray rates from trap data (see Table 36) and no information on the number of hatchery fish on spawning grounds.**

| Brood<br>Year  | (43)<br>Smolt<br>Release | (43W)<br>Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                |      |
|----------------|--------------------------|---------------------------|--------------------------|------------------------------------------------|----------------|------|
|                |                          |                           |                          | FW<br>Sport*                                   | Hatchery<br>** | SGS  |
| 1996           | 125,958                  |                           | 1998-99                  | 1,581                                          | 2,222          | n.a. |
| 1997           | 130,525                  |                           | 1999-00                  | 1,627                                          | 1,696          | n.a. |
| 1998           | 125,358                  |                           | 2000-01                  | 1,795                                          | 2,386          | n.a. |
| 1999           | 133,797                  |                           | 2001-02                  | 3,088                                          | 5,174          | n.a. |
| 2000           | 129,995                  |                           | 2002-03                  | 2,388                                          | 3,051          | n.a. |
| 2001           | 64,999                   | 59,315                    | 2003-04                  | 4,156                                          | 3,683          | n.a. |
| 2002           | 89,843                   | 39,341                    | 2004-05                  | 2,284                                          | 2,462          | n.a. |
| 2003           | 75,640                   | 14,384                    | 2005-06                  | 2,154                                          | 3,111          | n.a. |
| 2004           | 43,315                   | 89,037                    | 2006-07                  | 1,991                                          | 3,471          | n.a. |
| 2005           | 82,360                   | 49,762                    | 2007-08                  | 2,181                                          | 3,106          | n.a. |
| <b>Average</b> | <b>100,179</b>           | <b>50,368</b>             |                          | <b>2,325</b>                                   | <b>3,036</b>   |      |

\* = Alsea Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

**Table 36. Numbers of adult winter steelhead caught in traps in the Alsea Basin. Out of basin marks refer to hatchery fish that have a fin clip not applied to fish released at Alsea Hatchery (e.g. Ad clip only).**

| Return<br>year | site           | out of<br>basin<br>mark | in<br>basin<br>mark | not<br>recorde<br>d | wild<br>fish | Total<br>Numbe<br>r | % stray |
|----------------|----------------|-------------------------|---------------------|---------------------|--------------|---------------------|---------|
| 2009/10        | Cascade Cr     | 4                       | 0                   |                     | 11           | 15                  | 26.67%  |
| 2009/10        | Fall Cr        | 31                      | 2                   |                     | 97           | 130                 | 25.38%  |
| 2009/10        | Bohannon Falls | 5                       | 0                   |                     | 82           | 87                  | 5.75%   |
| 2008/09        | Cascade Cr     | 4                       | 0                   |                     | 3            | 7                   | 57.14%  |
| 2008/09        | Fall Cr        | 30                      | 0                   |                     | 166          | 196                 | 15.31%  |
| 2008/09        | Bohannon Falls | 19                      | 1                   |                     | 50           | 70                  | 28.57%  |
| 2007/08        | Cascade Cr     | 1                       | 0                   |                     | 7            | 8                   | 12.50%  |
| 2007/08        | Fall Cr        | 14                      | 0                   |                     | 114          | 128                 | 10.94%  |
| 2007/08        | Bohannon Falls | 0                       | 0                   | 4                   | 40           | 44                  | 9.09%   |
| 2006/07        | Cascade Cr     | 2                       | 1                   |                     | 3            | 6                   | 50.00%  |
| 2006/07        | Fall Cr        | 24                      | 2                   |                     | 89           | 115                 | 22.61%  |
| 2006/07        | Bohannon Falls | 4                       | 0                   |                     | 12           | 16                  | 25.00%  |
| 2005/06        | Cascade Cr     | 12                      | 2                   |                     | 17           | 31                  | 45.16%  |
| 2005/06        | Fall Cr        | 17                      | 0                   |                     | 50           | 67                  | 25.37%  |
| 2005/06        | Bohannon Falls | 0                       | 0                   | 10                  | 59           | 69                  | 14.49%  |

#### **2.1.4.6 South Umpqua Winter Steelhead (Stock 18)**

Cow Creek stock winter steelhead brood are collected at several locations. These include the Galesville Dam Trap, Canyon Creek Trap, and South Umpqua Falls Fishway. In addition, brood collection may be augmented by hook and line in the South Umpqua or tangle-netting between RM 0 to 70 on the South Umpqua. The adults are transferred to Rock Creek Hatchery for holding and spawning. The progeny are transferred to Cole Rivers Hatchery for their first year, then returned to Rock Creek. They are then transferred to several potential acclimation sites as 2-year old smolts. The acclimation sites include: the Canyonville Acclimation Facility, Seven Feathers Acclimation Facility, and Eastwood Elementary. All steelhead smolts were directly released into the South Umpqua between Canyonville and River Forks (RM 51 - RM 0) prior to 1999. The program has been doing 100% acclimation since 2002, thus stray rates to the North Umpqua have declined. A spawning ground survey was conducted in 2003 to document hatchery strays in tributaries within 10 miles above and 10 miles below Canyon Creek where over 90% of the smolts are acclimated. Less than 1% straying was documented. The program also annually monitors stray rates up at South Umpqua Falls where there has been less than 3% straying since 1999.

**Umpqua River releases:** During the past 10 years, the South Umpqua winter steelhead program has accounted for an average of 3,233 of the winter steelhead harvested in the Umpqua basin.

#### **2.1.4.7 Ten Mile Basin Winter Steelhead (Stock 88)**

The Tenmile winter steelhead stock broodstock are collected primarily through wild and hatchery returns to the Eel Lake Trap, which also functions as one of the smolt acclimation/release sites. Select anglers/STEP volunteers have also been authorized to collect wild steelhead while angling, and donate these fish to the Tenmile broodstock collection. The Tenmile winter steelhead stock was reared at Alsea Hatchery through the 1999 brood year. Due to straying concerns in the Alsea Basin, subsequent rearing has been at Cole Rivers Hatchery. Gametes are collected at the Eel Lake Trap site, and transported to Bandon Hatchery for fertilization and early incubation. Eyed eggs are transported to Cole Rivers Hatchery, for the remainder of incubation, ponding, and rearing to yearling smolts. Smolts are transported back to acclimation sites on Tenmile and Eel Creeks approximately three weeks prior to release in late April.

The goal of the program is to provide adult returns primarily for harvest. The establishment of a localized broodstock was completed from 1999-2000 through 2002-2003. With that “re-founding”, Coos stock (37) steelhead releases in Tenmile Basin were discontinued. In founding the localized broodstock, the program used 100% wild broodstock for one typical life cycle length (four years for steelhead). The objective of this program is to produce adults that return to acclimation sites and are isolated as much as possible from natural spawning and rearing areas. Beginning in 2003-2004 hatchery adults were used in the broodstock, with a minimum target percentage of 30% wild steelhead to be incorporated each year.

**Table 37. Release numbers, FW harvest estimates, and hatchery returns for South Umpqua stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                     |      |
|----------------|------------------|--------------------------|------------------------------------------------|---------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Hatchery<br>Trap ** | SGS  |
| 1996           | 86,229           | 1998-99                  | 1,741                                          | n.a.                | n.a. |
| 1997           | 45,168           | 1999-00                  | 1,586                                          | n.a.                | n.a. |
| 1998           | 103,524          | 2000-01                  | 2,584                                          | n.a.                | n.a. |
| 1999           | 104,853          | 2001-02                  | 2,551                                          | n.a.                | n.a. |
| 2000           | 83,080           | 2002-03                  | 2,504                                          | n.a.                | n.a. |
| 2001           | 35,084           | 2003-04                  | 3,416                                          | n.a.                | n.a. |
| 2002           | 135,823          | 2004-05                  | 4,002                                          | n.a.                | n.a. |
| 2003           | 67,707           | 2005-06                  | 5,258                                          | n.a.                | n.a. |
| 2004           | 106,076          | 2006-07                  | 5,754                                          | n.a.                | n.a. |
| 2005           | 8,273            | 2007-08                  | 2,931                                          | n.a.                | n.a. |
| <b>Average</b> | <b>77,582</b>    |                          | <b>3,233</b>                                   |                     |      |

\* = Umpqua Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

**Ten Mile Basin releases:** During the past 10 years, the Ten Mile winter steelhead program has accounted for an average of 209 of the winter steelhead harvested in the Ten Mile lakes basin.

**Table 38. Release numbers, FW harvest estimates, and hatchery returns for Ten Mile stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                     |      |
|----------------|------------------|--------------------------|------------------------------------------------|---------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Hatchery<br>Trap ** | SGS  |
| 1996           | 15,983           | 1998-99                  | 22                                             | n.a.                | n.a. |
| 1997           | 28,882           | 1999-00                  | 36                                             | n.a.                | n.a. |
| 1998           | 15,988           | 2000-01                  | 60                                             | n.a.                | n.a. |
| 1999           | 16,020           | 2001-02                  | 295                                            | n.a.                | n.a. |
| 2000           | 15,593           | 2002-03                  | 239                                            | n.a.                | n.a. |
| 2001           | 34,929           | 2003-04                  | 361                                            | n.a.                | n.a. |
| 2002           | 13,601           | 2004-05                  | 247                                            | n.a.                | n.a. |
| 2003           | 23,796           | 2005-06                  | 447                                            | n.a.                | n.a. |
| 2004           | 25,815           | 2006-07                  | 258                                            | n.a.                | n.a. |
| 2005           | 14,068           | 2007-08                  | 128                                            | n.a.                | n.a. |
| <b>Average</b> | <b>20,468</b>    |                          | <b>209</b>                                     |                     |      |

\* = Ten Mile Lakes Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

#### 2.14.8 Coos Basin Winter Steelhead (Stock 37)

The Coos winter steelhead stock broodstock are collected from wild and hatchery returns to the Millicoma Interpretive Center (MIC) Trap, by trapping at a weir trap on the lower West Fork Millicoma River, by entanglement netting in multiple locations of the Millicoma and South Coos subbasins, and by angler donation. Adult brood are held and spawned at the MIC facility on the West Fork Millicoma River. Gametes are transferred to Bandon Hatchery for fertilization and incubation. Eyed eggs from Bandon Hatchery are transported to Cole Rivers Hatchery for rearing to acclimation-ready smolts, and to the Millicoma Interpretive Center for incubation to unfed fry. A total of 125,000 yearling smolts are released from acclimation sites at Big Creek, Hodges, Rodine, East Fork Millicoma, and West Fork Millicoma sites, after three weeks of acclimation. Unfed fry (40,000) are released into reaches above barriers that have been altered for improved passage.

The goal of the smolt program is to provide fish for harvest that are genetically and ecologically similar to wild populations, to minimize any potential impacts to wild populations. Unfed fry are used as a “jumpstart” program to temporarily stock unseeded habitats in the Coos Basin. These releases are done for one typical life cycle length (4 yrs. for steelhead), in order to accelerate the pioneering of natural production in reaches that have recently been accessed by improved passage projects.

**Coos Basin releases:** During the past 10 years, the Coos winter steelhead program has accounted for an average of 1,533 of the winter steelhead harvested in the Coos basin.

**Table 39. Release numbers, FW harvest estimates, and hatchery returns for Coos stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                     |      |
|----------------|------------------|--------------------------|------------------------------------------------|---------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Hatchery<br>Trap ** | SGS  |
| 1996           | 140,287          | 1998-99                  | 1,411                                          | 620                 | n.a. |
| 1997           | 137,492          | 1999-00                  | 1,106                                          | 342                 | n.a. |
| 1998           | 117,659          | 2000-01                  | 1,077                                          | 478                 | n.a. |
| 1999           | 140,268          | 2001-02                  | 2,075                                          | 395                 | n.a. |
| 2000           | 143,439          | 2002-03                  | 1,369                                          | 527                 | n.a. |
| 2001           | 113,707          | 2003-04                  | 1,840                                          | 458                 | n.a. |
| 2002           | 87,120           | 2004-05                  | 1,558                                          | 230                 | n.a. |
| 2003           | 193,778          | 2005-06                  | 1,885                                          | 212                 | n.a. |
| 2004           | 135,307          | 2006-07                  | 1,736                                          | 668                 | n.a. |
| 2005           | 113,545          | 2007-08                  | 1,268                                          | 362                 | n.a. |
| <b>Average</b> | <b>132,260</b>   |                          | <b>1,533</b>                                   | <b>429</b>          |      |

\* = Coos Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

#### 2.1.4.9 Coquille Winter Steelhead (Stock 44 and Stock 144)

The Coquille Winter Steelhead (North Fork/East Fork - stock 44 and South Fork - stock 144) brood are held and spawned at Bandon. The eggs are incubated on site and approximately 50,000 (stock 44) and 20,000 (stock 144) eyed eggs are transferred to STEP hatchboxes. The remaining fish are reared at Bandon Hatchery to the smolt stage. A total of 45,000 stock 44 smolts are transferred to two

acclimation sites: Hantz Creek Acclimation site receives 25,000 fish that are released directly into Hantz Creek after acclimation. Approximately 20,000 smolts are released into the North Fork Coquille River after acclimation at Laverne Park. A total of 70,000 stock 144 smolts are reared at Bandon Hatchery, then transferred to two acclimation sites, Beaver Creek (40,000) and Woodward Creek (30,000).

The goal of the smolt program is to provide fish primarily for harvest that are genetically and ecologically similar to wild populations, to minimize potential impacts to wild populations. The unfed fry program is used to establish populations of steelhead in unseeded habitats in the Coquille Basin, primarily those with recently corrected passage barriers.

**Coquille Basin release:** During the past 10 years, the Coquille traditional and wild winter steelhead program has accounted for an average of 2,360 of the winter steelhead harvested in the Coquille basin.

**Table 40. Release numbers, FW harvest estimates, and hatchery returns for Coquille stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | (44)<br>Smolt<br>Release | (144)<br>Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                |      |
|----------------|--------------------------|---------------------------|--------------------------|------------------------------------------------|----------------|------|
|                |                          |                           |                          | FW<br>Sport*                                   | Hatchery<br>** | SGS  |
| 1996           | 60,314                   | 69,715                    | 1997-98                  | 1,605                                          | 248            | n.a. |
| 1997           | 28,476                   | 59,658                    | 1998-99                  | 1,653                                          | 191            | n.a. |
| 1998           | 26,038                   | 64,614                    | 1999-00                  | 1,215                                          | 189            | n.a. |
| 1999           | 41,763                   | 81,043                    | 2000-01                  | 1,627                                          | 143            | n.a. |
| 2000           | 47,045                   | 48,699                    | 2001-02                  | 2,537                                          | 157            | n.a. |
| 2001           | 60,534                   | 69,387                    | 2002-03                  | 2,106                                          | 221            | n.a. |
| 2002           | 48,199                   | 71,776                    | 2003-04                  | 2,789                                          | 220            | n.a. |
| 2003           | 50,398                   | 73,791                    | 2004-05                  | 2,267                                          | 100            | n.a. |
| 2004           | 49,202                   | 77,778                    | 2005-06                  | 2,763                                          | 0              | n.a. |
| 2005           | 51,803                   | 69,885                    | 2006-07                  | 3,120                                          | 0              | n.a. |
| <b>Average</b> | <b>45,570</b>            | <b>69,321</b>             |                          | <b>2,360</b>                                   |                |      |

\* = Coquille Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

#### 2.1.4.10 Chetco Basin Winter Steelhead (Stock 96)

Wild and hatchery Chetco River winter steelhead are collected by tangle net and hook and line in the Chetco River between December and March. The adults are held and spawned at the Elk River Hatchery. The progeny are subsequently reared

onsite to the smolt stage then transferred back to the Chetco River for release at (Social Security Bar), between mid-March and mid-April.

The goal of the Chetco River winter steelhead program is to provide fish for sport fishing harvest, while minimizing any potential adverse impacts to the wild populations, particularly the SONCC Coho which is listed as a threatened population under the federal ESA.

**Chetco Basin releases:** During the past 10 years, the Chetco winter steelhead program has accounted for an average of 832 of the winter steelhead harvested in the Chetco basin.

**Table 41. Release numbers, FW harvest estimates, and hatchery returns for Chetco stock winter steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                     |      |
|----------------|------------------|--------------------------|------------------------------------------------|---------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Hatchery<br>Trap ** | SGS  |
| 1996           | 42,895           | 1998-99                  | 638                                            | n.a.                | n.a. |
| 1997           | 45,425           | 1999-00                  | 517                                            | n.a.                | n.a. |
| 1998           | 47,622           | 2000-01                  | 591                                            | n.a.                | n.a. |
| 1999           | 50,951           | 2001-02                  | 1012                                           | n.a.                | n.a. |
| 2000           | 59,724           | 2002-03                  | 588                                            | n.a.                | n.a. |
| 2001           | 49,610           | 2003-04                  | 673                                            | n.a.                | n.a. |
| 2002           | 44,449           | 2004-05                  | 944                                            | n.a.                | n.a. |
| 2003           | 46,006           | 2005-06                  | 800                                            | n.a.                | n.a. |
| 2004           | 49,369           | 2006-07                  | 959                                            | n.a.                | n.a. |
| 2005           | 43,032           | 2007-08                  | 898                                            | n.a.                | n.a. |
| <b>Average</b> | <b>47,908</b>    |                          | <b>762</b>                                     |                     |      |

\* = Chetco Basin Catch, based on punch card returns. The 1999-00 to 2001-02 run years are hatchery fish only fisheries, harvest of wild fish (1/day, 5/season) was allowed during the 2002-03 to 2007-08 run years, with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.

## 2.1.5 ODFW Summer Steelhead Programs

### 2.1.5.1 Nestucca River Summer Steelhead (Stock 47)

The Nestucca River stock summer steelhead brood are collected, held, and spawned at Cedar Creek Hatchery. The progeny are reared to the smolt stage onsite. Approximately 70,000 smolts are released into the Nestucca River and ~30,000 are transferred to the Wilson River for release.

The goal of this program is to provide hatchery summer steelhead adults for recreational harvest in the Nestucca and Tillamook basins. In addition, the program provides educational opportunities for students and encourages volunteers.

**Nestucca R. and Wilson R. releases:** During the past 10 years, the Nestucca summer steelhead program has accounted for an average of 619 of the summer steelhead harvested in the Nestucca Basin and 507 of the summer steelhead harvest in the Tillamook Basin.

**Table 42. Release numbers, FW harvest estimates, and hatchery returns for Nestucca stock summer steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | Nestucc<br>a Smolt<br>Release | Wilson<br>Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                         |                                   |      |
|----------------|-------------------------------|----------------------------|--------------------------|------------------------------------------------|-------------------------|-----------------------------------|------|
|                |                               |                            |                          | Nestucca<br>FW<br>Sport *                      | Wilson<br>FW<br>Sport * | Nestucca<br>Hatchery<br>Return ** | SGS  |
| 1996           | 73,827                        | 50,811                     | 1998-99                  | 418                                            | 264                     | 606                               | n.a. |
| 1997           | 67,997                        | 50,201                     | 1999-00                  | 532                                            | 408                     | 1,102                             | n.a. |
| 1998           | 49,426                        | 29,785                     | 2000-01                  | 441                                            | 322                     | 984                               | n.a. |
| 1999           | 69,467                        | 30,298                     | 2001-02                  | 640                                            | 478                     | 2,071                             | n.a. |
| 2000           | 60,750                        | 34,875                     | 2002-03                  | 648                                            | 558                     | 2,283                             | n.a. |
| 2001           | 62,719                        | 41,067                     | 2003-04                  | 692                                            | 737                     | 2,376                             | n.a. |
| 2002           | 65,035                        | 46,066                     | 2004-05                  | 781                                            | 775                     | 3,159                             | n.a. |
| 2003           | 44,241                        | 36,253                     | 2005-06                  | 427                                            | 332                     | 2,405                             | n.a. |
| 2004           | 70,126                        | 36,494                     | 2006-07                  | 437                                            | 389                     | 920                               | n.a. |
| 2005           | 69,837                        | 47,091                     | 2007-08                  | 667                                            | 555                     | 1,860                             | n.a. |
| <b>Average</b> | <b>63,044</b>                 | <b>40,160</b>              |                          | <b>619</b>                                     | <b>507</b>              | <b>1,777</b>                      |      |

\* = Nestucca Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to hatchery returns.



### 2.1.5.2 Siletz River Summer Steelhead (Stock 33)

This program collects hatchery summer steelhead adults from the Siletz Falls Trap for broodstock. The adults are held and spawned at Cedar Creek Hatchery. Eggs are incubated to the eyed stage at Cedar Creek and then transferred to the Salmon River Hatchery where the eggs are hatched and reared to smolt. The smolts are then transferred to the mainstem Siletz near Moonshine Park (RM 52.5) for release.

The goal of this program is to provide for an average annual harvest of 2,400 hatchery summer steelhead while minimizing interactions with wild fish.

**Siletz R. release:** During the past 10 years, the Siletz summer steelhead program has accounted for an average of 1,419 of the summer steelhead harvested in the Siletz basin. Although there is no regular survey of spawning grounds, point data from traps in Mill Creek (0-70 fish/year), Palmer Creek and Schooner Creek suggest that very few of these fish stray within the basin. The Siletz Falls trap location in the upper mainstem provides excellent attraction for fish, especially during the summer months when river conditions tend to be low and warm.

**Table 43. Release numbers, FW harvest estimates, and hatchery returns for Siletz stock summer steelhead. Spawning grounds are not surveyed, so there is little data on stray rates.**

| Brood<br>Year  | Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                         |      |
|----------------|------------------|--------------------------|------------------------------------------------|-------------------------|------|
|                |                  |                          | FW<br>Sport *                                  | Siletz Falls<br>Trap ** | SGS  |
| 1996           | 79,770           | 1998-99                  | 2,106                                          | 2,003                   | n.a. |
| 1997           | 43,461           | 1999-00                  | 1,110                                          | 1,851                   | n.a. |
| 1998           | 81,228           | 2000-01                  | 1,030                                          | 1,888                   | n.a. |
| 1999           | 50,397           | 2001-02                  | 949                                            | 2,195                   | n.a. |
| 2000           | 77,674           | 2002-03                  | 1,352                                          | 2,891                   | n.a. |
| 2001           | 71,740           | 2003-04                  | 2,240                                          | 5,140                   | n.a. |
| 2002           | 70,993           | 2004-05                  | 1,640                                          | 4,615                   | n.a. |
| 2003           | 55,415           | 2005-06                  | 1,310                                          | 2,590                   | n.a. |
| 2004           | 72,029           | 2006-07                  | 1,112                                          | 2,444                   | n.a. |
| 2005           | 70,727           | 2007-08                  | 1,343                                          | 1,271                   | n.a. |
| <b>Average</b> | <b>67,343</b>    |                          | <b>1,419</b>                                   | <b>2,689</b>            |      |

\* = Siletz Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to trap returns.

### 2.1.5.3 North Umpqua River Summer Steelhead (Stock 55)

Returning adults are collected at Winchester Dam or Rock Creek Hatchery or as swim-ins to Rock Creek Hatchery. The adults are held and spawned at Rock Creek and transferred to Cole Rivers Hatchery for their first year. They are returned to Rock Creek and are primarily volitionally released from Rock Creek Hatchery. The program has in the past also released the smolts at Whistlers Bend (RM21) and Amacher Park (RM &).

The goal of this program is to provide a significant number of hatchery-produced steelhead for recreational fishing in the Umpqua basin. When available, ~2,000 eggs are provided for classroom incubators as part of a STEP project to help educate school children about salmonid biology, critical life cycles, and habitat requirements

**North Umpqua R. release:** During the past 10 years, the Umpqua summer steelhead program has accounted for an average of 1,503 of the summer steelhead harvested in the Umpqua basin.

**Table 44. Release numbers, FW harvest estimates, and hatchery returns for Umpqua stock summer steelhead. Spawning grounds are not surveyed, so there is no data on stray rates.**

| Brood<br>Year  | 1 yr<br>Smolt<br>Release | 2 yr<br>Smolt<br>Release | 2-salt<br>Return<br>Year | Estimated Adult Hatchery STW (2-salt + 3-salt) |                                |      |
|----------------|--------------------------|--------------------------|--------------------------|------------------------------------------------|--------------------------------|------|
|                |                          |                          |                          | FW<br>Sport *                                  | Winchester<br>Dam counts<br>** | SGS  |
| 1996           | 172,584                  |                          | 1998-99                  | 2,259                                          | 2,451                          | n.a. |
| 1997           | 84,070                   | 14,139                   | 1999-00                  | 1,172                                          | 1,300                          | n.a. |
| 1998           | 105,451                  | 23,614                   | 2000-01                  | 1,956                                          | 2,780                          | n.a. |
| 1999           | 143,602                  | 15,039                   | 2001-02                  | 2,228                                          | 2,287                          | n.a. |
| 2000           | 83,427                   | 74,937                   | 2002-03                  | 2,214                                          | 1,714                          | n.a. |
| 2001           | 42,585                   | 73,150                   | 2003-04                  | 1,505                                          | 2,017                          | n.a. |
| 2002           | 33,506                   | 91,591                   | 2004-05                  | 1,348                                          |                                | n.a. |
| 2003           |                          | 45,316                   | 2005-06                  | 1,061                                          |                                | n.a. |
| 2004           | 38,462                   | 24,852                   | 2006-07                  | 1,185                                          |                                | n.a. |
| 2005           | 15,242                   | 47,207                   | 2007-08                  | 762                                            |                                | n.a. |
| <b>Average</b> | <b>79,881</b>            | <b>43,179</b>            |                          | <b>1,503</b>                                   |                                |      |

\* = Umpqua Basin Catch, based on punch card returns. The 1997-98 to 2008-09 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

\*\* = Used average age composition from fishery scales to assign age to Winchester Dam counts.

## **Monitoring Steelhead Stray Rates**

As part of the Oregon Plan for Salmon and Watersheds, the Oregon Department of Fish and Wildlife (ODFW) initiated a project to monitor spawning winter steelhead (*Oncorhynchus mykiss*) in coastal Oregon streams in 2003. This project was designed to assess the yearly status and trend, presence of hatchery fish, and distribution of winter steelhead spawners in six coastal Monitoring Areas (MA) in two Distinct Population Segments (DPS). In 2008 the project was modified to assess status only at the DPS level. Given this change, ODFW can defensibly argue hatchery influence only at the monitoring area scale. In some systems (e.g. Siletz and Alsea) ODFW maintains adult traps and obtains annual point estimates of in- and out-of-basin strays for both winter and summer steelhead. However, a single trap site cannot account for the overall impacts of straying in a given basin. The pattern of straying is as important as the raw number or percentage of hatchery strays. Furthermore, it is difficult to know whether the fish caught in these traps are strays in the true sense, or whether they would have eventually returned to the site of release if given the opportunity.

### **2.1.6 ODFW Trout Programs**

#### **2.1.6.1 Cape Cod Rainbow Trout (Stock 72)**

The goal of this program is to provide legal-sized and trophy-sized rainbow trout for release in lakes to meet statewide trout program objectives. Broodstock are maintained and eggs are collected at Roaring River Hatchery and distributed to other hatcheries as eyed eggs or fingerlings.

Alsea Hatchery rears ~203,438 rainbow trout for release into Mid-Coast District and North Willamette District lakes. Production consists of 147,600 fish reared to a size of 3.0 fish/pound for release into various lakes from February to June. Trophy production consists of 55,838 fish reared to a size of 1.5 fish/pound or larger for release into various lakes from February to June. All of these fish are marked prior to release.

Bandon Hatchery rears 2,800 rainbow trout for release into Coos-Coquille District lakes. Production consists of 750 fish reared to a size of 0.5 fish/pound and 1,250 fish reared to a size of 0.4 fish/pound for release into various Coos-Coquille District lakes from March to June. An additional 800 fish are reared to a size of 0.8 fish/pound for release into Bradley Lake in October. None of these fish are marked.

Elk River Hatchery rears 7,000 rainbow trout for release into South Coast District lakes. Production consists of 2,000 fish reared to a size of 3.0 fish/pound and 3,200 fish reared to a size of 2.8 fish/pound for release into various South Coast District lakes from April to August. Trophy production consists of 1,800 fish are reared to a size of 1.5 fish/pound or larger for release from April to June. None of these fish are marked.

Nehalem Hatchery conducts rearing for ~83,950 rainbow trout for release into North Coast District lakes. This program also produces ~1,500 eggs for STEP classroom incubators. Production consists of 74,700 fish reared to a size of 2.8 fish/pound for release into various North Coast District lakes from March to June. An additional 7,700 fish are reared to a size of 1 fish/pound for release into various North Coast District lakes in June, July and September. Trophy production consists of 1,550 fish reared to a size of 0.5 fish/pound for release into various North Coast District lakes in mid-September. None of these fish are marked.

Rock Creek Hatchery conducts rearing for ~57,600 rainbow trout for release into Umpqua District lakes. Production consists of 54,100 fish reared to a size of 2.4 fish/pound for release into various Umpqua District lakes from March to June. Trophy production consists of 3,500 fish reared to a size of 0.5 fish/pound for release into various Umpqua District lakes in late August. None of these fish are marked.

Salmon River Hatchery rears ~46,500 rainbow trout for release into North Coast District and Mid-Coast District lakes. Production consists of 32,500 fish reared to a size of 3.0 fish/pound and 7,000 reared to a size of 2.0 for release into various lakes from March to April. Trophy production consists of 7,000 fish reared to a size of 1.0 fish/pound for release into various Mid-Coast District lakes in early June. 20,000 fish for release into Devil's Lake are marked prior to release.

#### **2.1.6.1 Fish Creek Rainbow Trout (Stock 551)**

The goal of this program is to develop a hatchery broodstock similar to wild populations to minimize any potential impacts to wild populations for reseeding and angler harvest in water bodies in the North Umpqua High Cascade Basin. Wild fish are collected for broodstock from Fish Creek during the summer months and held at Rock Creek Hatchery until ready to spawn the following year. The hatchery rears 12,600 trout for stocking into various Umpqua District lakes. This program also produces 1,000 eyed eggs for Umpqua District STEP programs. Production consists of 8,600 fingerlings reared to a size of 30 fish/pound for stocking in various lakes in June and September, and 4,000 fish reared to a size of 3.0 fish/pound for stocking in Lemolo Reservoir in late August. None of these fish are marked.

## **2.2 A Review of the Economic Aspects of Oregon Department of Fish and Wildlife Coastal Hatcheries**

### **2.2.1 Introduction**

The 75<sup>th</sup> Oregon Legislative Assembly passed House Bill 3489, which was focused on state-operated coastal hatcheries. Through legislative action in House Bill 3489, the Oregon Department of Fish and Wildlife (ODFW) was directed to develop a plan to reform operations of the hatcheries on the Oregon Coast. Aspects of this plan include broodstock and production strategies, needs assessment for hatchery infrastructure, compliance with the National Pollution Discharge Elimination System (NPDES), and disease management.

The purpose of this section is to provide a framework with which to evaluate the economic impacts and benefits that these hatcheries provide to the citizens of Oregon. This review is focused on hatchery production, returns, and sport and commercial harvest of salmon, coho, steelhead, and trout. Facilities reviewed include Butte Falls, Elk River, Cedar Creek, Rock Creek, Alsea, Bandon, Salmon River, North Nehalem, and Trask River Hatcheries. For the purposes of this analysis, hatchery operations are defined as the collection of broodstock, spawning, rearing, release, and adult returns of fish stocks produced by ODFW hatchery facilities. Hatchery contributions to catch were estimated using coded wire tags that marked the fish according to their hatchery origins. In some fisheries, returned combined angling tags (punch cards) were the source of data. Ocean sampling of recreationally and commercially harvested Chinook and Coho salmon made it possible to estimate the impact on these fisheries from hatchery releases.

### **2.2.2 Literature Review**

In the first review of hatcheries on the Columbia River, Worland, Wahle, and Zimmer (1969) estimate a net benefit of \$1,917,003 in 1961 dollars from the hatchery-reared fall Chinook that are caught in the Ocean and Columbia River. The benefit to cost ratio is 2.3 to 1 when the net economic benefits are compared to the costs of operating fish hatcheries. This landmark study uses the value of \$8.87 per fish to estimate the net benefits to sport anglers. This value was generated by an earlier study by Brown, Singh, and Castle (1964.) The researchers surveyed Oregon salmon and steelhead sport anglers to determine their willingness-to-pay for the ability to fish for these species.

More recently, a review of the hatcheries that are operated by the Mitchell Act found an overall benefit to cost ratio of 0.6 for the operation of hatcheries. Individual hatchery performance varied widely, however. One aspect of the benefit cost calculation that could substantially change the outcome is the survival rate of salmonids in the ocean. Survival rates are thought to be linked to ocean conditions, and complete understanding of survival outcomes and projections is not yet present in the scientific community.

Passive use values that people hold for the hatchery contribution to salmon and steelhead runs could also contribute to the net benefits of hatchery releases. Bell, Huppert and Johnson (2003) find a mean willingness to pay for a high level of coho salmon enhancement of \$25.39 per household to \$120.50 per household for high-income respondents on the Oregon Coast. Low-income respondents were willing to pay an average of \$24.48 to \$78.94 for fisheries enhancements. This particular survey defined high fisheries enhancements as increases in run size of 100,000 fish each year. Respondents could have been reacting to personally held values of coho conservation for its own sake (passive use values) or the desire to fish for the species as recreation or work (use values.)

The previous hatchery review conducted by Dr. Chris Carter of ODFW in 1999 found a range of benefit-cost ratios for hatchery operations. The production of hatchery trout yielded net benefits ranging from \$2,000 per 1,000 legal trout released to \$9,000 per 1,000 legal trout released. This was based on an assumed catch rate of 1 fish per day in the trout fisheries and was estimated according to a range of catch rates (10% to 50% of stocked fish eventually caught by sport anglers.) Salmon and steelhead hatchery releases were estimated to have a benefit to cost ratio that varies according to the ocean survival rates of the hatchery released fish. A previous ODFW staff analysis for the Columbia River and Coastal hatcheries in 1990 was based on early to mid 80's brood year CWT data. Trout programs had positive net benefits except for cutthroat production. Salmon and steelhead results were mixed. Although the average across hatcheries for each species (ChF, ChS, Coho, Steelhead, and Trout) was positive, some individual species/hatchery programs had costs that exceeded net benefits.

### **2.2.3 Economic Value Concepts Used in this Report**

ODFW and federal agencies fund hatcheries to generate and preserve the values that people hold for the fish species produced. Hatchery fish are intended to provide opportunities for commercial and recreational fishing as well as nonconsumptive recreational values including photography and art.

There are two primary approaches to valuing fish resources. The first involves measuring the money generated in the general economy as a result of sport or commercial fishing activity. Anglers spend money associated with trips and equipment as a result of fishing opportunities. Commercial fish landings generate income for commercial fishers as well as the entities that process the fish. These cash flows ripple through the economy through the "multiplier process." Ultimately, they increase income and employment in the sectors that serve the recreational and commercial fishing industry.

A second approach to valuing a fishery involves money that never changes hands in the economy. Each person who chooses to fish for recreation participates because there is enjoyment in doing so. In most cases, some amount of money is also spent to participate in fishing. It is likely that the prices paid for fishing are equal to or smaller than the largest amount the angler would be willing to pay to participate. The difference between this "total willingness to pay" and the amount actually paid is the net economic value or "consumer surplus" or a measure of the benefits to the

angler as they enjoy fishing, over and above the costs. This approach to measuring economic value is therefore called the “net economic value” approach.

In most economic markets, the price is chosen to clear the market between buyers and sellers of goods and services. This means that the price the buyer wants to pay lines up with the costs of producing the product that the seller is willing to accept for the product. The price is a signal of the value of the product to society (to both buyers and sellers.) In the majority of cases, public goods such as the opportunity to catch more fish are not directly traded in economic markets. There is no price or signal to indicate the value to the public of these opportunities. If such a price existed, it would signal to the resource producer (or in some cases, the resource preserver) how much of the fishing opportunity should be provided. In the United States, the Public Trust Doctrine assigns ownership of fish and wildlife resources to the State or Federal Governments. Without a price signal, there is no indication of the value of the fishing opportunity to the public or how much should be provided. Economic analysis of the net benefits associated with fishing would therefore rely on non-market valuation techniques to estimate the value of the resource to the public.

To complicate matters further, fishing opportunity is only one dimension of the value of the fishery resource. Non-use values such as existence values, ecosystem service values, or aesthetic values such as photography and art inspired by fish populations are also not traded on the free market. People value the existence of a fish species for its own sake or for the options to fish for the species in the future. Bequest values are related to the importance that is placed on passing down fish resources to the next generations. None of these values involve money changing hands, but that does not make them any less real. There is significant disagreement among economists on whether these nonuse values can be measured accurately, but these values find their expression qualitatively in environmental regulations and laws such as the federal Endangered Species Act.

This net economic value approach to measuring economic values is generally the method employed in benefit cost analysis. The analysis is focused on economic surpluses created by a government project and how those surpluses compare to the cost of the project. A benefit-cost ratio is yielded from this type of analysis; any ratio over 1 indicates a project where benefits exceed costs. In this type of analysis, we can evaluate the conditions under which a project has a positive net benefit to society. This type of analysis can help decision-makers to answer the question of if/how hatcheries should be operated to benefit society within the context of overall fisheries policy and management.

In contrast, a study of economic impacts is focused on monetary activity actually generated in the economy in response to a project or policy decision. Surveys measure direct levels of expenditures by recreational anglers to participate in the sport. These expenditures are processed in an input-output model such as IMPLAN to estimate the impacts on related sectors of the economy. Measures of business revenues, jobs, and personal income associated with the expenditures help decision-makers to evaluate the outcomes of programs. Through the “ripple effect” each expenditure will ultimately affect personal income through the business activity it generates. Similarly, economic activity is generated when a fish is landed and

processed in the commercial fishery. The impact begins with a fish landing in the commercial fishing sector instead of the sporting equipment or tourism sector.

#### **2.2.4 Cost Benefit Analysis Approach**

There are a number of variables that present a challenge when modeling the economic benefits of hatchery supplementation. These include biological and catch rate parameters that are often highly variable. ODFW staff biologists were involved in the development of economic information because it is driven by underlying assumptions about the social and biological elements of the fisheries. The economic models differ widely for trout, fall Chinook, spring Chinook, and Coho fisheries. All of the models are based on underlying values per recreational angler day and values for commercial harvest of the hatchery species. These are derived from existing economic studies and surveys. Therefore, the first step to this analysis was to review existing studies on the value of recreational fishing per day that focus on each of the three species under review.

Many studies on the net willingness to pay for a fishing trip include values per angler trip or angler day. The day estimates are then translated into the values per fish. The reader is cautioned that the values individuals hold for the fishing trip include all aspects of the trip, such as time with family and friends, time outdoors, and other elements that make trips enjoyable.

**Table 45. Average value per salmon or steelhead caught in sport fisheries.**

| LOCATION            | REF; DATE                        | Average Value per Fish Caught (\$)                                                                 | Average Value per Fish Caught (2009\$)                                                               |
|---------------------|----------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Oregon / Washington | Olsen, Richards, and Scott; 1990 | Ocean Salmon: 41.61<br>Coastal Salmon: 36.72<br>Coastal Steelhead: 64.06                           | Ocean Salmon: 63.25<br>Coastal Salmon: 55.83<br>Coastal Steelhead: 97.39                             |
| Rogue River         | Olsen, et al; 1994               | Summer Steelhead: 82.00<br>Fall Chinook: 75.60<br>Winter Steelhead: 44.20<br>Spring Chinook: 63.60 | Summer Steelhead: 124.67<br>Fall Chinook: 114.94<br>Winter Steelhead: 67.20<br>Spring Chinook: 96.69 |

Similar studies have been conducted on trout fisheries.



**Table 46. Average value per trout caught in sport fisheries.**

| LOCATION       | REF; DATE                          | METHOD   | \$ per day              | \$2009 per day |
|----------------|------------------------------------|----------|-------------------------|----------------|
| Idaho          | Gordon, Chapman & Bjornn; 1973     | TCM      | 3.65<br>(1971)          | 16.48          |
| Idaho          | Sorg & Loomis; 1986                | TCM; CVM | 25.55; 14.25<br>(1982)  | 52.72; 29.41   |
| Montana        | Duffield, Loomis & Brooks; 1987    | TCM      | 40.68 – 87.18<br>(1985) | 75.02 – 160.77 |
| Oregon         | Brown & Hay, 1987                  | CVM      | 12<br>(1980)            | 28.80          |
| Oregon         | Waddington, Boyle & Cooper; (1994) | CVM      | 42<br>(1991)            | 62.50          |
| USFWS Region 1 | Boyle, Roach & Waddington (1998)   | CVM      | 12<br>(1996)            | 15.58          |

The values per angler day are likely to differ according to the characteristics of individual fisheries. Values per angler day in this report are based on these studies, but no one study provides the exact value per angler day that can be applied to all of the trout fisheries supported by the coastal hatcheries.

The analysis also includes existing hatchery production cost data. Costs per pound are evaluated for species, and combined with releases and catch rates to determine a cost/benefit ratio for each stock of fish. Estimated costs per pound in previous reports were prorated by present hatchery operation costs as they compare to past costs. In some cases, the number of fish released per pound has changed for species.

In previous hatchery reviews, sport catch information was not available, so estimates were made over a range of assumed survival rates, recreational and commercial catch, and angler days. This information on harvest is available for this analysis, so the only assumptions that are necessary are those about angler days that are spent to catch the fish reported harvested. Parameters were estimated for the cost per fish and the net economic value for recreational angling for each species.

**Table 47. Parameters for Economic Models - Salmon and Steelhead.**

| Parameter | Fall Chinook (13/lb) | Spring Chinook (10/lb) | Steelhead | Coho   |
|-----------|----------------------|------------------------|-----------|--------|
| Value per | \$19.58              | \$19.58                | N/A       | \$6.40 |

|                                                                                                                                                                                                              |                        |                        |                       |                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|-----------------------|------------------------|
| Commercial Fish /1                                                                                                                                                                                           |                        |                        |                       |                        |
| Value Per Sport Fish – Ocean /2                                                                                                                                                                              | \$63.21                | \$63.21                |                       | \$63.21                |
| Value Per Sport Fish – Inland /3                                                                                                                                                                             | \$94.88                | \$126.50               | \$126.50              | \$63.21                |
|                                                                                                                                                                                                              |                        |                        |                       |                        |
| Size at Release                                                                                                                                                                                              | 13 per pound           | 10 per pound           | 6 per pound           | 15 per pound           |
| Cost per Smolt /4                                                                                                                                                                                            | \$4.39/lb/13<br>\$0.33 | \$4.39/lb/10<br>\$0.43 | \$4.39/lb/6<br>\$0.72 | \$4.39/lb/15<br>\$0.29 |
| 1 / Based on 1998 commercial values, preliminary                                                                                                                                                             |                        |                        |                       |                        |
| 2 / Based on a value per day of \$50 for ocean salmon in 1999, adjusted to 2009\$ using the GDP Deflator and a catch rate of 1 per day                                                                       |                        |                        |                       |                        |
| 3 / May be too conservative for high-quality inland fall Chinook fisheries, based on a value of \$75 per sport fish in 1999, adjusted to 2009\$.                                                             |                        |                        |                       |                        |
| 4 / Cost in 2007-2009 biennium were \$4.34 per pound. Costs were adjusted to reflect inflation according to the Implicit Price Deflator for the Gross Domestic Product (109.764 in 2009 and 108.486 in 2008) |                        |                        |                       |                        |

### **2.2.5 Steelhead Benefit-Cost Model**

Harvest information was derived from the voluntary return of harvest cards. The total fish harvested generated a net benefit whether they were in the sport or commercial fishery. A value per fish caught was assigned to be \$126.50 based on values per steelhead angler day of \$20 to \$70, and catch rates of 3 to 4 days per fish.

**Table 48. Steelhead Benefit/Cost Model**

| HATCHERY                                                       | Nestucca<br>(47) -<br>Wilson R | Nestucca<br>(47) -<br>Nestucca<br>R | Siletz<br>(33) -<br>Siletz R | Umpqua<br>(55) - N<br>Fk.<br>Umpqua | Nehalem<br>(32) -<br>Necanicum<br>R | Nehalem<br>(32) N Fk.<br>Nehalem | Nestucca<br>R<br>(47/121) -<br>Wilson<br>and<br>Kilchis<br>River | Nestucca<br>R (47W) -<br>Nestucca<br>R | Siletz<br>(33W) | Alsea R<br>(43) -<br>Big Elk<br>Creek |
|----------------------------------------------------------------|--------------------------------|-------------------------------------|------------------------------|-------------------------------------|-------------------------------------|----------------------------------|------------------------------------------------------------------|----------------------------------------|-----------------|---------------------------------------|
| Smolts                                                         | 40,160                         | 63,044                              | 67,343                       | 62,710                              | 40,419                              | 94,877                           | 73,846                                                           | 107,429                                | 52,203          | 20,533                                |
| Total ocean harvest                                            | 0                              | 0                                   | 0                            | 0                                   | 0                                   | 0                                | 0                                                                | 0                                      | 0               | 0                                     |
| Ocean commercial harvest                                       | 0                              | 0                                   | 0                            | 0                                   | 0                                   | 0                                | 0                                                                | 0                                      | 0               | 0                                     |
| Ocean sport harvest                                            | 0                              | 0                                   | 0                            | 0                                   | 0                                   | 0                                | 0                                                                | 0                                      | 0               | 0                                     |
| Freshwater harvest                                             | 507                            | 619                                 | 1,419                        | 1,503                               | 406                                 | 1,092                            | 2,109                                                            | 1,509                                  | 1,908           | 201                                   |
| Value of Hatchery Fish Harvest in Common<br>Property Fisheries |                                |                                     |                              |                                     |                                     |                                  |                                                                  |                                        |                 |                                       |
| Value per Commercial Fish                                      |                                |                                     |                              |                                     |                                     |                                  |                                                                  |                                        |                 |                                       |
| Value per Sport Fish - Ocean                                   |                                |                                     |                              |                                     |                                     |                                  |                                                                  |                                        |                 |                                       |
| Value per Sport Fish - Inland                                  | \$126.50                       | \$126.50                            | \$126.50                     | \$126.50                            | \$126.50                            | \$126.50                         | \$126.50                                                         | \$126.50                               | \$126.50        | \$126.50                              |
| Total Value                                                    | \$64,136                       | \$78,304                            | \$179,504                    | \$190,130                           | \$51,359                            | \$138,138                        | \$266,789                                                        | \$190,889                              | \$241,362       | \$25,427                              |
| Cost per Smolt (\$4.34/lb with 6 fish/lb)                      | \$0.73                         | \$0.73                              | \$0.73                       | \$0.73                              | \$0.73                              | \$0.73                           | \$0.73                                                           | \$0.73                                 | \$0.73          | \$0.73                                |
| Total Cost                                                     | \$29,049                       | \$45,602                            | \$48,711                     | \$545,360                           | \$29,236                            | \$68,628                         | \$53,415                                                         | \$77,707                               | \$37,760        | \$14,852                              |
| B-C                                                            | \$35,087                       | \$32,702                            | \$130,793                    | \$144,770                           | \$22,123                            | \$69,510                         | \$213,374                                                        | \$113,182                              | \$203,602       | \$10,575                              |
| B/C                                                            | <b>\$2.21</b>                  | <b>\$1.72</b>                       | <b>\$3.69</b>                | <b>\$4.19</b>                       | <b>\$1.76</b>                       | <b>\$2.01</b>                    | <b>\$4.99</b>                                                    | <b>\$2.46</b>                          | <b>\$6.39</b>   | <b>\$1.71</b>                         |

STEELHEAD BENEFIT/COST MODEL (CONTINUED)

| HATCHERY                                                       | Alsea R<br>(43/43W) -<br>N Fk.<br>Alsea | Ten Mile<br>(88) - Ten<br>Mile Basin | Cow Creek<br>018 - S Fk.<br>Umpqua R | Coos (37) -<br>Coos Basin | Coquille<br>(44/144) -<br>Coquille<br>Basin | Chetco (96)<br>- Chetco R | Subtotal    |
|----------------------------------------------------------------|-----------------------------------------|--------------------------------------|--------------------------------------|---------------------------|---------------------------------------------|---------------------------|-------------|
| Smolts                                                         | 83,575                                  | 20,468                               | 77,582                               | 132,260                   | 57,445                                      | 47,908                    |             |
| Total ocean harvest                                            |                                         |                                      |                                      |                           |                                             |                           |             |
| Ocean commercial harvest                                       |                                         |                                      |                                      |                           |                                             |                           |             |
| Ocean sport harvest                                            |                                         |                                      |                                      |                           |                                             |                           |             |
| Freshwater harvest                                             | 2,325                                   | 209                                  | 3,233                                | 1,533                     | 2,360                                       | 762                       |             |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                                         |                                      |                                      |                           |                                             |                           |             |
| Value per Commercial Fish                                      |                                         |                                      |                                      |                           |                                             |                           |             |
| Value per Sport Fish - Ocean                                   |                                         |                                      |                                      |                           |                                             |                           |             |
| Value per Sport Fish - Inland                                  | \$126.50                                | \$126.50                             | \$126.50                             | \$126.50                  | \$126.50                                    | \$126.50                  |             |
| Total Value                                                    | \$294,113                               | \$26,439                             | \$408,975                            | \$193,925                 | \$298,540                                   | \$105,248                 | \$2,753,273 |
| Cost per Smolt (\$4.34/lb with 6<br>fish/lb)                   | \$0.73                                  | \$0.73                               | \$0.73                               | \$0.73                    | \$0.73                                      | \$0.73                    |             |
| Total Cost                                                     | \$60,452                                | \$14,805                             | \$56,117                             | \$95,668                  | \$41,551                                    | \$34,653                  | \$753,570   |
| B-C                                                            | \$233,660                               | \$11,634                             | \$352,857                            | \$98,257                  | \$256,988                                   | \$70,595                  | \$1,999,707 |
| B/C                                                            | <b>\$4.87</b>                           | <b>\$1.79</b>                        | <b>\$7.29</b>                        | <b>\$2.03</b>             | <b>\$7.18</b>                               | <b>\$3.04</b>             |             |

### 2.2.6 Spring Chinook Benefit Cost Model

The benefit-cost model was applied to the Spring Chinook stocks released in the coastal hatchery system. Commercial and recreational catch estimates were derived from coded wire tag information and voluntary return of harvest cards. The fish were released at ~10 per pound with a cost of \$4.34 per pound. The cost translates to \$0.44 per smolt. Net economic values for a day of fishing were estimated at \$63.25 in the ocean and \$126.50 inland. These are based on the 1999 ODFW Hatchery Review figures with the values inflated to 2009 dollars. The value per commercial fish is based on an assumed average weight of 11 pounds per fish and recent ex-vessel prices for a commercially-caught fish.

**Table 49. Spring Chinook Evaluation Model**

| HATCHERY                                                       | Trask (34) -<br>Trask River | Trask (34) -<br>Wilson River | Nestucca<br>(47) -<br>Nestucca<br>River | Umpqua<br>(55) -<br>Umpqua<br>River, North<br>Fk. | Subtotal     |
|----------------------------------------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------------------|--------------|
| Smolts                                                         | 101,982                     | 145,063                      | 116,402                                 | 316,232                                           |              |
| Total ocean harvest                                            | 369                         | 273                          | 351                                     | 1,763                                             |              |
| Ocean commercial harvest                                       | 330                         | 241                          | 321                                     | 1,572                                             |              |
| Ocean sport harvest                                            | 39                          | 32                           | 30                                      | 191                                               |              |
| Freshwater harvest                                             | 553                         | 163                          | 571                                     | 1,726                                             |              |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                             |                              |                                         |                                                   |              |
| Value per Commercial Fish                                      | \$19.58                     | \$19.58                      | \$19.58                                 | \$19.58                                           |              |
| Value per Sport Fish - Ocean                                   | \$63.25                     | \$63.25                      | \$63.25                                 | \$63.25                                           |              |
| Value per Sport Fish - Inland                                  | \$126.50                    | \$126.50                     | \$126.50                                | \$126.50                                          |              |
| Total Value                                                    | \$78,882.65                 | \$27,362.28                  | \$80,414.18                             | \$261,199.51                                      | \$447,858.62 |
| Cost per Smolt (\$4.34/lb with 10<br>fish per pound)           | \$0.44                      | \$0.44                       | \$0.44                                  | \$0.44                                            |              |
| Total Cost                                                     | \$44,260.19                 | \$62,957.34                  | \$50,518.47                             | \$137,244.69                                      | \$294,980.69 |
| B-C                                                            | \$34,622.46                 | \$(35,595.0)                 | \$29,895.71                             | \$123,954.82                                      | \$152,877.93 |
| B/C                                                            | <b>1.78</b>                 | <b>0.43</b>                  | <b>1.59</b>                             | <b>1.90</b>                                       |              |

### **2.2.7 Fall Chinook Benefit-Cost Model**

The model evaluates 8 stocks of Fall Chinook releases. The net economic value for a sport fish is less than the \$126.50 for a Spring Chinook, and was placed at \$94.88 in inland sport fisheries. In the ocean, the value for a sport fish is estimated at \$63.25. This may not be the case in select high-value inland Fall Chinook fisheries. These values are based on the ODFW hatchery review in 1999, and values have been inflated to 2009 dollars. Recent ex-vessel values have resulted in an estimate of \$19.58 per commercially-caught fish.

**Table 50. Fall Chinook Evaluation Model.**

| HATCHERY                                                       | Trask (34) -<br>Necanicum<br>R | Trask<br>(34) -<br>Trask R | Salmon<br>R (36) | Yaquina<br>(146) | Coos (37)<br>- Coos<br>Basin | Coquille<br>R. (44) -<br>Coquille<br>R | Elk R<br>(35) - Elk<br>R | Chetco (96)<br>- Chetco | Subtotal  |
|----------------------------------------------------------------|--------------------------------|----------------------------|------------------|------------------|------------------------------|----------------------------------------|--------------------------|-------------------------|-----------|
| Smolts                                                         | 26,618                         | 78,768                     | 202,592          | 119,965          | 760,767                      | 76,972                                 | 325,508                  | 172,927                 |           |
| Total ocean harvest                                            | 169                            | 462                        | 1,008            | 932              | 2,847                        | 684                                    | 2,632                    | 464                     |           |
| Ocean commercial harvest                                       | 151                            | 360                        | 834              | 753              | 2,299                        | 577                                    | 2,483                    | 367                     |           |
| Ocean sport harvest                                            | 18                             | 102                        | 174              | 179              | 558                          | 107                                    | 149                      | 97                      |           |
| Freshwater harvest                                             | 31                             | 643                        | 932              | N/A              | 1,169                        | 220                                    | 1,073                    | 200                     |           |
| Value of Hatchery Fish Harvest in Common<br>Property Fisheries |                                |                            |                  |                  |                              |                                        |                          |                         |           |
| Value per Commercial Fish                                      | \$19.58                        | \$19.58                    | \$19.58          | \$19.58          | \$19.58                      | \$19.58                                | \$19.58                  | \$19.58                 |           |
| Value per Sport Fish - Ocean                                   | \$63.25                        | \$63.25                    | \$63.25          | \$63.25          | \$63.25                      | \$63.25                                | \$63.25                  | \$63.25                 |           |
| Value per Sport Fish - Inland                                  | \$94.88                        | \$94.88                    | \$94.88          | \$94.88          | \$94.88                      | \$94.88                                | \$94.88                  | \$94.88                 |           |
| Total Value                                                    | \$7,036                        | \$74,508                   | \$115,763        | \$26,065         | \$191,223                    | \$38,939                               | \$159,848                | \$32,297                | \$645,680 |
| Cost per Smolt (\$4.34/lb with 13 fish/pound)                  | \$0.34                         | \$0.34                     | \$0.34           | \$0.34           | \$0.34                       | \$0.34                                 | \$0.34                   | \$0.34                  |           |
| Total Cost                                                     | \$8,886                        | \$26,296                   | \$67,635         | \$40,050         | \$253,979                    | \$25,697                               | \$108,670                | \$57,731                | \$588,944 |
| B-C                                                            | \$(1,850)                      | \$48,212                   | \$48,129         | \$(13,984)       | \$(62,756)                   | \$13,242                               | \$51,178                 | \$(25,434)              | \$56,736  |
| B/C                                                            | <b>0.79</b>                    | <b>2.83</b>                | <b>1.71</b>      | <b>0.65</b>      | <b>0.75</b>                  | <b>1.52</b>                            | <b>1.47</b>              | <b>0.56</b>             |           |

### 2.2.8 Coho Evaluation Model

Values per commercial fish are considered extra revenues to the vessels that would not be accrued if the hatchery releases were not in place. It is assumed throughout this analysis that vessels don't incur additional costs to fish for hatchery fish. Angler values per day were assumed to be the same for ocean and inland fisheries. The values are based on the 1999 ODFW Hatchery Review and have been inflated to 2009 dollars. Commercial fish values are based on the most recent ex-vessel values.

**Table 51. Coho Evaluation Model.**

| HATCHERY                                                       | Nehalem (32)<br>Fishhawk (99) | Trask (34)  | Umpqua (55)  | Subtotal     |
|----------------------------------------------------------------|-------------------------------|-------------|--------------|--------------|
| Smolts                                                         | 186,113                       | 153,321     | 105,695      |              |
| Total ocean harvest                                            | 208                           | 519         | 359          |              |
| Ocean commercial harvest                                       | 13                            | 29          | 18           |              |
| Ocean sport harvest                                            | 195                           | 490         | 341          |              |
| Freshwater harvest                                             | 418                           | 370         | 2,959        |              |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                               |             |              |              |
| Value per Commercial Fish                                      | \$6.42                        | \$6.42      | \$6.42       |              |
| Value per Sport Fish - Ocean                                   | \$63.25                       | \$63.25     | \$63.25      |              |
| Value per Sport Fish - Inland                                  | \$63.25                       | \$63.25     | \$63.25      |              |
| Total Value                                                    | \$38,855.71                   | \$54,581.18 | \$208,840.56 | \$302,277.45 |
| Cost per Smolt (\$4.34/lb, with 15<br>smolts/lb)               | \$0.29                        | \$0.29      | \$0.29       |              |
| Total Cost                                                     | \$53,848.69                   | \$44,360.88 | \$30,581.09  | \$128,790.66 |
| B-C                                                            | \$(14,992.98)                 | \$10,220.30 | \$178,259.47 |              |
| <b>B/C</b>                                                     | <b>0.72</b>                   | <b>1.23</b> | <b>6.83</b>  |              |



### 2.2.9 Trout Evaluation Model

The review includes the three species of trout that are raised by the coastal hatcheries for release into lakes and streams. A review of the trout fisheries in the Florence area provided valuable information on the percentages of trout caught in this region. The study included three categories of lakes according to size and evaluated trout releases in 17 lakes through creel surveys. It was found that 31.2% of the trout were harvested. This is an average over all the lakes studied, but smaller lakes had higher catch rates when compared to larger lakes. It was assumed that one trout would be caught per angler day. Net economic values per fish were estimated at \$25 according to the meta analysis conducted for the 1999 ODFW Hatchery Review. A factor of 1.298 brought this number up to 2009 dollars for inflation based on the GDP implicit price deflator.

**Table 52. Trout Evaluation Model.**

| HATCHERY                                                     | RAINBOW<br>TROUT (053) | RAINBOW<br>TROUT (072) | RAINBOW<br>TROUT (072T) | RAINBOW<br>TROUT<br>(551F) |
|--------------------------------------------------------------|------------------------|------------------------|-------------------------|----------------------------|
| Fish Released                                                | 45,902                 | 111,318                | 315,269                 | 7,807                      |
| Proportion Harvested                                         | 0.312                  | 0.312                  | 0.312                   | 0.312                      |
| Fish Harvested                                               | 14,321                 | 34,731                 | 98,364                  | 2,436                      |
| Value Per Sport Fish (\$25.00 per fish x<br>1.298 to 2009\$) | \$32.45                | \$32.45                | \$32.45                 | \$32.45                    |
| Total Value                                                  | \$464,730              | \$1,127,028            | \$3,191,909             | \$79,041                   |
| Pounds of Fish Released                                      | 24,616                 | 45,413                 | 151,741                 | 1,690                      |
| Cost per Pound                                               | \$4.03                 | \$4.03                 | \$4.03                  | \$4.03                     |
| Total Cost                                                   | \$99,202               | \$183,014              | \$611,516               | \$6,811                    |
| B-C                                                          | \$365,528              | \$944,014              | \$2,580,393             | \$72,230                   |
| <b>B/C</b>                                                   | <b>4.685</b>           | <b>6.158</b>           | <b>5.220</b>            | <b>11.605</b>              |

### 2.2.10 Hatchery Cost-Benefit Models

Values for the various types of stocks have been applied to hatchery release information.

**Table 53. Alsea Hatchery Cost-Benefit Model**

|                                                                | Rainbow Trout<br>(072T) | Winter<br>Steelhead<br>(043& 043W) | TOTAL          |
|----------------------------------------------------------------|-------------------------|------------------------------------|----------------|
| Fish Released                                                  | 227,723                 | 171,080                            |                |
| Proportion in ocean harvest                                    | 0                       | 0                                  |                |
| Proportion in ocean comml. harvest                             | 0                       | 0                                  |                |
| Proportion in ocean sport harvest                              | 0                       | 0                                  |                |
| Total ocean harvest                                            | 0                       | 0                                  |                |
| Ocean commercial harvest                                       | 0                       | 0                                  |                |
| Ocean sport harvest                                            | 0                       | 0                                  |                |
| Proportion in freshwater harvest                               | 0.312                   | .014765                            |                |
| Freshwater harvest                                             | 71,050                  | 2,526                              |                |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                         |                                    |                |
| Value per Commercial Fish                                      |                         |                                    |                |
| Value per Sport Fish - Ocean                                   |                         |                                    |                |
| Value per Sport Fish - Inland                                  | \$ 32.45                | \$126.50                           |                |
| Total Value                                                    | \$2,305,558.74          | \$319,539.00                       | \$2,625,097.70 |
| Cost Operation and Maintenance                                 |                         |                                    | \$637,866.00   |
| Annual Costs of Capital Improvement<br>(6.61%)                 |                         |                                    | \$42,162.94    |
| Total Hatchery Costs in 2008                                   |                         |                                    | \$680,028.94   |
| Cost Adjustment to 2009\$ (x 1.012)                            |                         |                                    | \$688,189.29   |
| B-C                                                            |                         |                                    | \$1,936,908.50 |
| <b>B/C</b>                                                     |                         |                                    | <b>3.814</b>   |

**Table 54. Bandon Hatchery Cost-Benefit Model.**

|                                                                | Rainbow Trout<br>(072T) | Winter<br>Steelhead<br>(044 & 144) | TOTAL          |
|----------------------------------------------------------------|-------------------------|------------------------------------|----------------|
| Fish Released                                                  | 1,689                   | 57,455                             |                |
| Proportion in ocean harvest                                    | 0                       | 0                                  |                |
| Proportion in ocean comml. harvest                             | 0                       | 0                                  |                |
| Proportion in ocean sport harvest                              | 0                       | 0                                  |                |
| Total ocean harvest                                            | 0                       | 0                                  |                |
| Ocean commercial harvest                                       | 0                       | 0                                  |                |
| Ocean sport harvest                                            | 0                       | 0                                  |                |
| Proportion in freshwater harvest                               | 0.312                   | 0.0132625                          |                |
| Freshwater harvest                                             | 527                     | 762                                |                |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                         |                                    |                |
| Value per Commercial Fish                                      |                         |                                    |                |
| Value per Sport Fish - Ocean                                   |                         |                                    |                |
| Value per Sport Fish - Inland                                  | \$32.45                 | \$126.50                           |                |
| Total Value                                                    | \$17,100.11             | \$96,393.00                        | \$113,493.11   |
| Cost Operation and Maintenance                                 |                         |                                    | \$472,274.00   |
| Annual Costs of Capital Improvement<br>(6.61%)                 |                         |                                    | \$31,217.31    |
| Total Hatchery Costs in 2008                                   |                         |                                    | \$503,491.31   |
| Cost Adjustment to 2009\$ (x 1.012)                            |                         |                                    | \$509,533.21   |
| B-C                                                            |                         |                                    | \$(396,040.21) |
| <b>B/C</b>                                                     |                         |                                    | <b>0.223</b>   |

**Table 55. Butte Falls Hatchery Cost-Benefit Model**

|                                                             | Rainbow Trout (072) | TOTAL          |
|-------------------------------------------------------------|---------------------|----------------|
| Fish Released                                               | 28,452              |                |
| Proportion in ocean harvest                                 | 0                   |                |
| Proportion in ocean comml. harvest                          | 0                   |                |
| Proportion in ocean sport harvest                           | 0                   |                |
| Total ocean harvest                                         | 0                   |                |
| Ocean commercial harvest                                    | 0                   |                |
| Ocean sport harvest                                         | 0                   |                |
| Proportion in freshwater harvest                            | 0.312               |                |
| Freshwater harvest                                          | 8,877               |                |
| Value of Hatchery Fish Harvest in Common Property Fisheries |                     |                |
| Value per Commercial Fish                                   |                     |                |
| Value per Sport Fish - Ocean                                |                     |                |
| Value per Sport Fish - Inland                               | \$32.45             |                |
| Total Value                                                 | \$288,059.43        | \$288,059.43   |
| Cost Operation and Maintenance                              |                     | \$484,580.00   |
| Annual Costs of Capital Improvement (6.61%)                 |                     | \$32,030.74    |
| Total Hatchery Costs in 2008                                |                     | \$516,610.74   |
| Cost Adjustment to 2009\$ (x1.012)                          |                     | \$522,810.07   |
| B-C                                                         |                     | \$(234,750.64) |
| <b>B/C</b>                                                  |                     | <b>0.551</b>   |

**Table 56. Cedar Creek Hatchery Cost-Benefit Model**

|                                                             | Rainbow Trout (072) | Rainbow Trout (072T) | Summer Steelhead (047) | Winter Steelhead (047& 047F) | ChS (047)   | TOTAL        |
|-------------------------------------------------------------|---------------------|----------------------|------------------------|------------------------------|-------------|--------------|
| Fish Released                                               | 500                 | 508                  | 103,204                | 206,194                      | 116,402     |              |
| Proportion in ocean harvest                                 | 0                   | 0                    | 0                      | 0                            | 0.003015412 |              |
| Proportion in ocean comml. harvest                          | 0                   | 0                    | 0                      | 0                            | 0.002757685 |              |
| Proportion in ocean sport harvest                           | 0                   | 0                    | 0                      | 0                            | 0.000257728 |              |
| Total ocean harvest                                         | 0                   | 0                    | 0                      | 0                            | 408         |              |
| Ocean commercial harvest                                    | 0                   | 0                    | 0                      | 0                            | 321         |              |
| Ocean sport harvest                                         | 0                   | 0                    | 0                      | 0                            | 30          |              |
| Proportion in freshwater harvest                            | 0.312               | 0.312                | .0109104               | 0.0142826                    | 0.004905414 |              |
| Freshwater harvest                                          | 156                 | 158                  | 1,126                  | 2,945                        | 571         |              |
| Value of Hatchery Fish Harvest in Common Property Fisheries |                     |                      |                        |                              |             |              |
| Value per Commercial Fish                                   |                     |                      |                        |                              | \$19.58     |              |
| Value per Sport Fish - Ocean                                |                     |                      |                        |                              | \$63.25     |              |
| Value per Sport Fish - Inland                               | \$32.45             | \$32.45              | \$126.50               | \$126.50                     | \$126.50    |              |
| Total Value                                                 | \$5,062.20          | \$5,143.20           | \$142,439.00           | \$372,542.50                 | \$80,414.18 | \$605,601.08 |
| Cost Operation and Maintenance                              |                     |                      |                        |                              |             | \$525,119.00 |
| Annual Costs of Capital Improvement (6.61%)                 |                     |                      |                        |                              |             | \$34,710.37  |
| Total Hatchery Costs in 2008                                |                     |                      |                        |                              |             | \$559,829.37 |
| Cost Adjustment to 2009\$ (x 1.012)                         |                     |                      |                        |                              |             | \$566,547.32 |
| B-C                                                         |                     |                      |                        |                              |             | \$45,771.71  |
| <b>B/C</b>                                                  |                     |                      |                        |                              |             | <b>1.069</b> |

**Table 57. Elk River Hatchery Cost-Benefit Model**

|                                                                | Rainbow<br>Trout (072T) | Winter<br>Steelhead<br>(096) | ChF (035)    | ChF (096)   | TOTAL          |
|----------------------------------------------------------------|-------------------------|------------------------------|--------------|-------------|----------------|
| Fish Released                                                  | 1,199                   | 47,908                       | 325,508      | 172,927     |                |
| Proportion in ocean harvest                                    | 0                       | 0                            | 0.0080858    | 0.0026832   |                |
| Proportion in ocean comml. harvest                             | 0                       | 0                            | 0.007628     | 0.0021222   |                |
| Proportion in ocean sport harvest                              | 0                       | 0                            | 0.0004577    | 0.0005609   |                |
| Total ocean harvest                                            | 0                       | 0                            | 2,632        | 464         |                |
| Ocean commercial harvest                                       | 0                       | 0                            | 2,483        | 367         |                |
| Ocean sport harvest                                            | 0                       | 0                            | 149          | 97          |                |
| Proportion in freshwater harvest                               | 0.312                   | 0.0159054                    | 0.0032963    | 0.0011623   |                |
| Freshwater harvest                                             | 374                     | 762                          | 1,073        | 201         |                |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                         |                              |              |             |                |
| Value per Commercial Fish                                      |                         |                              | \$19.58      | \$19.58     |                |
| Value per Sport Fish - Ocean                                   |                         |                              | \$63.25      | \$63.25     |                |
| Value per Sport Fish - Inland                                  | \$32.45                 | \$126.50                     | \$94.88      | \$94.88     |                |
| Total Value                                                    | \$12,139.16             | \$96,393.00                  | \$159,847.63 | \$32,391.99 | \$300,771.78   |
| Cost Operation and Maintenance                                 |                         |                              |              |             | \$681,040.00   |
| Annual Costs of Capital Improvement<br>(6.61%)                 |                         |                              |              |             | \$45,016.74    |
| Total Hatchery Costs in 2008                                   |                         |                              |              |             | \$726,056.74   |
| Cost Adjustment to 2009\$ (x 1.012)                            |                         |                              |              |             | \$734,769.42   |
| B-C                                                            |                         |                              |              |             | \$(433,997.64) |
| <b>B/C</b>                                                     |                         |                              |              |             | <b>0.409</b>   |

**Table 58. Nehalem Hatchery Cost-Benefit Model**

|                                                             | Rainbow Trout (072) | Winter Steelhead (032 & 099) | Coho (032 & 099) | ChF (034)  | TOTAL          |
|-------------------------------------------------------------|---------------------|------------------------------|------------------|------------|----------------|
| Fish Released                                               | 82,366              | 135,296                      | 186,113          | 26,618     |                |
| Proportion in ocean harvest                                 | 0                   | 0                            | 0.0011176        | 0.0063866  |                |
| Proportion in ocean comml. harvest                          | 0                   | 0                            | 0.0000698        | 0.0057104  |                |
| Proportion in ocean sport harvest                           | 0                   | 0                            | 0.0010477        | 0.0006762  |                |
| Total ocean harvest                                         | 0                   | 0                            | 208              | 170        |                |
| Ocean commercial harvest                                    | 0                   | 0                            | 13               | 152        |                |
| Ocean sport harvest                                         | 0                   | 0                            | 195              | 18         |                |
| Proportion in freshwater harvest                            | 0.312               | 0.011072                     | 0.0022566        | 0.0011646  |                |
| Freshwater harvest                                          | 25,698              | 1,498                        | 420              | 31         |                |
| Value of Hatchery Fish Harvest in Common Property Fisheries |                     |                              |                  |            |                |
| Value per Commercial Fish                                   |                     |                              | \$6.42           | \$19.58    |                |
| Value per Sport Fish - Ocean                                |                     |                              | \$63.25          | \$63.25    |                |
| Value per Sport Fish - Inland                               | \$32.45             | \$126.50                     | \$63.25          | \$94.88    |                |
| Total Value                                                 | \$833,906.33        | \$189,497.00                 | \$38,982.21      | \$7,055.94 | \$1,069,441.40 |
| Cost Operation and Maintenance                              |                     |                              |                  |            | \$636,019.00   |
| Annual Costs of Capital Improvement (6.61%)                 |                     |                              |                  |            | \$42,040.86    |
| Total Hatchery Costs in 2008                                |                     |                              |                  |            | \$678,059.86   |
| Cost Adjustment to 2009\$ (x 1.012)                         |                     |                              |                  |            | \$686,196.57   |
| B-C                                                         |                     |                              |                  |            | \$383,244.50   |
| <b>B/C</b>                                                  |                     |                              |                  |            | <b>1.558</b>   |

**Table 59. Rock Creek Hatchery Cost-Benefit Model**

|                                                             | Rainbow Trout (053) | Rainbow Trout (072T) | Rainbow Trout (551F) | Summer Steelhead (055) | Coho (018)   | ChS (055)    | TOTAL          |
|-------------------------------------------------------------|---------------------|----------------------|----------------------|------------------------|--------------|--------------|----------------|
| Fish Released                                               | 8,017               | 56,354               | 7,807                | 62,710                 | 105,695      | 316,232      |                |
| Proportion in ocean harvest                                 | 0                   | 0                    | 0                    | 0                      | 0.0034249    | 0.005575     |                |
| Proportion in ocean comml. harvest                          | 0                   | 0                    | 0                    | 0                      | 0.0001703    | 0.004971     |                |
| Proportion in ocean sport harvest                           | 0                   | 0                    | 0                    | 0                      | 0.0032262    | 0.0006039    |                |
| Total ocean harvest                                         | 0                   | 0                    | 0                    | 0                      | 362          | 1,763        |                |
| Ocean commercial harvest                                    | 0                   | 0                    | 0                    | 0                      | 18           | 1,572        |                |
| Ocean sport harvest                                         | 0                   | 0                    | 0                    | 0                      | 341          | 191          |                |
| Proportion in freshwater harvest                            | 0.312               | 0.312                | 0.312                | 0.023967469            | 0.0279956    | 0.005458     |                |
| Freshwater harvest                                          | 2,501               | 17,582               | 2,436                | 1,503                  | 2,959        | 1,726        |                |
| Value of Hatchery Fish Harvest in Common Property Fisheries |                     |                      |                      |                        |              |              |                |
| Value per Commercial Fish                                   |                     |                      |                      |                        | \$6.42       | \$19.58      |                |
| Value per Sport Fish - Ocean                                |                     |                      |                      |                        | \$63.25      | \$63.25      |                |
| Value per Sport Fish - Inland                               | \$32.45             | \$32.45              | \$32.45              | \$126.50               | \$63.25      | \$126.50     |                |
| Total Value                                                 | \$81,167.31         | \$570,550.44         | \$79,041.19          | \$190,129.50           | \$206,943.06 | \$261,199.51 | \$1,389,031.00 |
| Cost Operation and Maintenance                              |                     |                      |                      |                        |              |              | \$835,840.00   |
| Annual Costs of Capital Improvement (6.61%)                 |                     |                      |                      |                        |              |              | \$55,249.02    |
| Total Hatchery Costs in 2008                                |                     |                      |                      |                        |              |              | \$891,089.02   |
| Cost Adjustment to 2009\$ (x 1.012)                         |                     |                      |                      |                        |              |              | \$901,782.09   |
| B-C                                                         |                     |                      |                      |                        |              |              | \$487,248.91   |
| <b>B/C</b>                                                  |                     |                      |                      |                        |              |              | <b>1.540</b>   |



**Table 60. Salmon River Hatchery Cost-Benefit Model**

|                                                             | Rainbow Trout (053) | Rainbow Trout (072T) | Summer Steelhead (033) | ChF (036)    | TOTAL        |
|-------------------------------------------------------------|---------------------|----------------------|------------------------|--------------|--------------|
| Fish Released                                               | 37,885              | 27,796               | 67,343                 | 202,592      |              |
| Proportion in ocean harvest                                 | 0                   | 0                    | 0                      | 0.0049755    |              |
| Proportion in ocean comml. harvest                          | 0                   | 0                    | 0                      | 0.0041166    |              |
| Proportion in ocean sport harvest                           | 0                   | 0                    | 0                      | 0.0008588    |              |
| Total ocean harvest                                         | 0                   | 0                    | 0                      | 1,008        |              |
| Ocean commercial harvest                                    | 0                   | 0                    | 0                      | 834          |              |
| Ocean sport harvest                                         | 0                   | 0                    | 0                      | 174          |              |
| Proportion in freshwater harvest                            | 0.312               | 0.312                | 0.0210712              | 0.0046003    |              |
| Freshwater harvest                                          | 11,820              | 8,672                | 1,419                  | 932          |              |
| Value of Hatchery Fish Harvest in Common Property Fisheries |                     |                      |                        |              |              |
| Value per Commercial Fish                                   |                     |                      |                        | \$19.58      |              |
| Value per Sport Fish - Ocean                                |                     |                      |                        | \$63.25      |              |
| Value per Sport Fish - Inland                               | \$32.45             | \$32.45              | \$126.50               | \$94.88      |              |
| Total Value                                                 | \$383,562.89        | \$281,417.82         | \$179,503.50           | \$115,763.38 | \$960,247.59 |
| Cost Operation and Maintenance                              |                     |                      |                        |              | \$546,730.00 |
| Annual Costs of Capital Improvement (6.61%)                 |                     |                      |                        |              | \$36,138.85  |
| Total Hatchery Costs in 2008                                |                     |                      |                        |              | \$582,868.85 |
| Cost Adjustment to 2009\$ (x 1.012)                         |                     |                      |                        |              | \$589,863.28 |
| B-C                                                         |                     |                      |                        |              | \$370,384.31 |
| <b>B/C</b>                                                  |                     |                      |                        |              | <b>1.627</b> |

**Table 61. Trask Hatchery Cost-Benefit Model**

|                                                                | Winter<br>Steelhead<br>(121F) | Coho (034)  | ChF (034)   | ChS (034)    | TOTAL          |
|----------------------------------------------------------------|-------------------------------|-------------|-------------|--------------|----------------|
| Fish Released                                                  | 46,226                        | 153,321     | 78,768      | 247,045      |                |
| Proportion in ocean harvest                                    | 0                             | 0.003385    | 0.0058653   | 0.0025987    |                |
| Proportion in ocean comml.<br>harvest                          | 0                             | 0.0001891   | 0.0045703   | 0.0023113    |                |
| Proportion in ocean sport<br>harvest                           | 0                             | 0.0031959   | 0.0012949   | 0.0002873    |                |
| Total ocean harvest                                            | 0                             | 519         | 462         | 642          |                |
| Ocean commercial harvest                                       | 0                             | 29          | 360         | 571          |                |
| Ocean sport harvest                                            | 0                             | 490         | 102         | 71           |                |
| Proportion in freshwater harvest                               | 0.0145589                     | 0.0024132   | 0.0081632   | 0.0028982    |                |
| Freshwater harvest                                             | 673                           | 370         | 643         | 716          |                |
| Value of Hatchery Fish Harvest in<br>Common Property Fisheries |                               |             |             |              |                |
| Value per Commercial Fish                                      |                               | \$6.42      | \$19.58     | \$19.58      |                |
| Value per Sport Fish - Ocean                                   |                               | \$63.25     | \$63.25     | \$63.25      |                |
| Value per Sport Fish - Inland                                  | \$126.50                      | \$63.25     | \$94.88     | \$126.50     |                |
| Total Value                                                    | \$85,134.5                    | \$54,581.18 | \$74,508.14 | \$106,244.93 | \$320,468.75   |
| Cost Operation and Maintenance                                 |                               |             |             |              | \$577,748.00   |
| Annual Costs of Capital<br>Improvement (6.61%)                 |                               |             |             |              | \$38,189.14    |
| Total Hatchery Costs in 2008                                   |                               |             |             |              | \$615,937.14   |
| Cost Adjustment to 2009\$ (x<br>1.012)                         |                               |             |             |              | \$623,328.39   |
| B-C                                                            |                               |             |             |              | \$(302,859.64) |
| <b>B/C</b>                                                     |                               |             |             |              | <b>0.514</b>   |

### **2.2.11 References**

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## **2.3 Coastal Hatcheries General Evaluation**

### **2.3.1 Alsea Hatchery Evaluation**

Alsea Hatchery is a diverse production facility. The hatchery utilizes a variety of raceways, circular tanks and adult trapping / brood ponds. There are two adult traps located on the grounds which are vital in collecting winter steelhead brood stock, limiting passage of hatchery steelhead into natural habitat upstream from the hatchery, monitoring hatchery winter steelhead returns and returns of wild steelhead and coho and Chinook salmon. The hatchery also assists the Oregon Hatchery Research Center at Fall Creek in research projects.

Alsea Hatchery provides the district with approximately 225,000 legal or larger rainbow trout for stocking in 22 coastal district lakes with minimal impacts to wild fish. These releases provide for very popular fisheries from Newport down to Florence and provide many residents and tourists with excellent angling opportunities. The hatchery also provides rainbow trout for several Willamette Valley and North Coast water bodies. The hatchery supports several stocks of winter steelhead which are stocked into the Alsea (120,000), Yaquina (20,000) and Siletz (50,000) rivers. These hatchery winter steelhead smolt releases provides anglers with excellent boat and bank angling opportunities from December through April. These are very popular fisheries and support a large contingent of anglers. Production goals are consistently met each year for all steelhead and rainbow stocks.

### **Passage/Screening**

#### **Passage**

##### ***Selective Barrier***

On the Alsea, a concrete dam at intake located one-quarter mile upstream from the Hatchery is a barrier. A new fish ladder and sorting facility has been installed, which created a selective barrier. Wild winter steelhead, wild coho, wild fall Chinook and wild spring Chinook adults that enter the upper trap are passed upstream.

#### **Screening**

Fish screening criteria by the NOAA Fisheries for anadromous salmonids is for a perforated plate opening not to exceed 3/32 inch in diameter or a woven wire opening not to exceed 3/32-inch measured diagonally. The screening at Alsea Hatchery is 3/16-inch and does not meet NOAA Fisheries criteria.

### **Legal Mandates and Commitments**

#### **Legal Commitments/Treaty Obligations**

Alsea Hatchery has no legal, mitigation, or treaty obligations. There is research associated with this facility in collaboration with the Oregon Hatchery Research Center located at Fall Creek (Alsea). This research evaluates various performance attributes and treatments of both the rainbow trout and winter steelhead broodstocks from Alsea Hatchery.

At the Alsea Hatchery, there are four propagation programs for this district: rainbow trout for stocking in coastal lakes, winter steelhead for the Alsea (two broodstocks), winter steelhead for the Yaquina and winter steelhead for the Siletz. HGMPs have been completed for all of these programs.

### **Salmon Trout Enhancement (STEP) Program**

- Alsea Wild Winter Steelhead Program (75,000 eggs)
  - STEP volunteers angling for broodstock
- Classroom Incubator Program
  - Eggs provided to 10 schools for classroom teaching units
- Stream Enrichment Program
  - Watershed Councils, schools and other volunteers participate

There is some peripheral STEP involvement; there will be minor impacts to the program if this facility closes.

### **2.3.2 Bandon Hatchery Evaluation**

Bandon Hatchery is very unique in that production poundage is lower than most facilities, but egg production, distribution and diversity is very high. Currently nine different stocks of fish and/or eggs are handled at Bandon Hatchery. In the past several years, the hatchery was integral in several short-term conservation programs. For example, Floras Creek coho were collected, spawned, eggs incubated and transferred to a STEP hatchbox project for a three-year period. This program resulted in coho fry releases in sections of the stream determined to be suitable for supplementation. All hatchery programs in the Coos, Coquille, and Tenmile basins are dependent upon Bandon Hatchery. Past attempts at incubating eggs at various STEP facilities has not proved practical or cost effective. Additionally, the water supply at Bandon Hatchery is extremely reliable, and includes a state-of-the-art alarm system.

### **Passage/Screening**

#### **Passage**

##### ***Selective Barrier***

A pipe weir across Ferry Creek diverts fish up a short fishway into a collection pond. Some fish have passed the weir on extremely high water. This is not a concern since the intake dams are complete barriers. Fish are sorted and selectively put above the weir into the two short sections of creek that have good available spawning habitat.

##### ***Complete Barrier***

No anadromous fish can pass the two reservoir dam spillways. There are resident cutthroat in the reservoirs and upper creeks. Disease risk will increase with consideration of passage accommodation at the dams.

#### **Screening**

Each intake is a 4-foot by 4-foot by 12-foot tower with 1/8-inch perforated aluminum screen on three sides of the tower. The water depth varies, but averages 10 feet

deep. Because of the design and location, there is extremely low water velocity at the screens (1/8-inch per second). The reservoir water flow is usually near zero unless the creeks are at flood stage. The perforation size of the intake screens does not currently meet NOAA Fisheries criteria (3/32" openings); however this affects only resident fish, since anadromous fish cannot pass above the dams.

### **Legal Commitments/Treaty Obligations**

Bandon Hatchery does not operate through any specific legal, mitigation, research studies, or treaty commitments. Fall Chinook production at Bandon Hatchery does contribute to the broad state commitments to the Pacific Salmon Treaty.

There are easements for both the City of Bandon and cranberry growers to operate pump houses and pipelines. As stated above, there is a reversion clause for the land. Essentially, the clause states that in the event that ODFW discontinues fish rearing at the Bandon Hatchery, a significant portion of the land would revert back to the heirs of the original owners. About 15 years ago, there was an attempt by the heirs to obtain the land as a result of Bandon Hatchery being operated as a private facility for a few years in the early 1980s. An ODFW agreement with the private company provided for steelhead smolts to be reared in exchange for use of the facility. This fulfilled the obligation for rearing fish, and avoided implementation of the reversion clause.

### **Salmon Trout Enhancement Program (STEP)**

Bandon Hatchery is very much integral to local STEP projects, not only with regard to incubating eggs, but also assisting with facilities, brood collection and cooperative projects. No other ODFW hatchery has as high a level of involvement in so many different projects. Very substantial reductions to the STEP program in the Coos/Coquille/Tenmile District would result if the facility did not operate. Volunteers and agency staff have cooperatively constructed and operated five hatcheries and 19 acclimation sites over the past several years. The estimated capital investment (as of 2006) towards these STEP facilities was 2.5 million dollars. Volunteers expend thousands of dollars annually to operate these satellite stations. All eggs and many of the fish releases have their origin at Bandon Hatchery and its role in eyeing eggs for these diverse programs is instrumental to the perpetuation of these programs. Many of the programs include the use of a substantial number of naturally-produced adult salmonids for broodstock, and produce fish to augment existing fisheries.

- **Stream Enrichment Program**

- Spawned carcasses (winter steelhead, coho, and fall Chinook) from Bandon Hatchery are placed in a number of Coquille watershed streams.

- **Hatchbox/Unfed Fry Program**

- Most of the hatchbox/unfed fry programs conducted in the district are supplementation or habitat "jumpstart" projects. Volunteer cooperators receive eggs from Bandon Hatchery and produce unfed fry.

- **Classroom Incubator Program**
  - Some eggs produced at Bandon Hatchery are also transferred to classroom incubators. These projects are a popular educational tool. A total of 11 incubators were used in 12 different schools (2009 Annual District STEP Report).

### **2.3.3 Butte Falls Hatchery Evaluation**

At full production Butte Falls Hatchery annually supplies over 750,000 rainbow trout, salmon and steelhead to benefit anglers in Southwest Oregon. Under normal operations production consists of 100,000 fall Chinook salmon smolts, 192,500 coho salmon smolts, 402,500 fingerling rainbow trout, and 77,120 legal rainbow trout. The diversity of production at the hatchery has benefited the Coquille and Umpqua watersheds with salmon and steelhead releases, along with trout releases targeting Coos County, Curry County, and some Rogue Valley waterbodies.

Butte Falls Hatchery is ready to resume full production in 2010 after an outbreak of infectious hematopoietic necrosis virus (IHNV) occurred at the hatchery in 2006. It is believed that wild adult fish carrying IHNV that swam above the hatchery intake caused the viral outbreak. Butte Falls Hatchery has been virus free for three consecutive years, and is cleared for full production per ODFW Fish Health Management Policy this year. Program changes will mean somewhat different numbers and stocks of fish for future production at the hatchery.

Prior to 2006 Butte Falls Hatchery regularly met production goals, and was the highest ranked facility among the nine coastal hatcheries, with top scores in economic analyses, passage and screening, and conservation ranking.

The issue of fish passage and disease risk at the facility is discussed in more detail below. A key fact is that the occurrence of IHNV at Butte Falls Hatchery appears to be a relic of record returns of winter steelhead in the Rogue River at the turn of the century.

Fish counting began at Gold Ray Dam in 1942. The top three returns of winter steelhead (hatchery and wild) recorded since 1942 occurred 2002-2004. Focusing on wild fish only, these years still remain among the highest returns ever recorded at Gold Ray: 2003—15,558 (3<sup>rd</sup> highest return); 2004—14,293 (6<sup>th</sup> highest return); 2002—11,046 (13<sup>th</sup> highest return).

ODFW estimated that total returns to the river during three run years 1977/78-1979/80 averaged 43,000 wild winter steelhead (Effects of Lost Creek Dam on Winter Steelhead of the Rogue River, Phase 2 Completion Report, ODFW 1990); during this time the count of wild winter steelhead over Gold Ray Dam ranged between 4,226 and 6,783 fish. The bottom line is that winter steelhead were present in the watershed at very high levels at the time of the outbreak.



## **Passage**

### **A. Passage in the watershed**

A falls on South Fork Big Butte Creek is the namesake for the town of Butte Falls, Oregon. The falls is located at approximately rivermile 1.5, and the hatchery at approximately rivermile 2.5. Historical reports refer to the falls as a 15 foot drop. A habitat survey of the South Fork Big Butte completed by ODFW estimated the height of the falls at 3.5 meters/11.5 feet (1997 ODFW Aquatic Inventory Project Stream Report). Anadromous fish must pass Butte Falls in order to reach the upper South Fork and the hatchery water supply



**Falls on South Fork Big Butte Creek**

ODFW considered the falls a barrier to anadromous distribution for many years. Minor modifications have occurred over time, but passage of adult salmonids is still thought to occur primarily when flow conditions are ideal for passage.

ODFW operated a downstream migrant smolt trap on South Fork Big Butte Creek to evaluate the level of anadromous fish production above the falls in 1999-2001. Despite operating the trap an average of 111 days each year, the total catch of steelhead ranged from 19-32 steelhead smolts and 48-106 smaller steelhead. Some coho fry were captured in 1999, and some coho smolts were captured in 2000. Based on the survey, the district determined that only a low level of production of steelhead occurs on the South Fork above the falls, and only periodic, minor coho production

### **B. Passage at the hatchery**

All native migratory fish species present in South Fork Big Butte Creek have excellent year-round opportunities to migrate by Butte Falls Hatchery. The investment in a new intake facility in 2003 ensures that the hatchery is in compliance with passage criteria.

## **Screening**

Currently there is a new screening and downstream migrant bypass facility at the hatchery intake structure. The investment was funded by the Restoration and Enhancement Program. It meets current NOAA Fisheries standards for fish screening and downstream migrant bypass.

## **Legal Mandates and Commitments**

### **Legal Commitments/Treaty Obligations**

Before the 2006 IHNV outbreak, Butte Falls Hatchery fulfilled some of the mitigation obligations for Douglas County's FERC License for lost coho habitat in the South Umpqua Basin. Fall Chinook production at Butte Falls hatchery also contributed to the broad state commitments to the Pacific Salmon Treaty.

### **Salmon Trout Enhancement (STEP) Program**

Prior to the 2006 IHNV outbreak Butte Falls Hatchery STEP commitments were as follows:

- Hatchbox programs for Coquille Basin fall Chinook and Umpqua Basin coho
- Classroom incubator program for the Coquille and South Umpqua basins

### **2.3.4 Cedar Creek Hatchery Evaluation**

Cedar Creek Hatchery provides production of ~110,000 spring Chinook, ~190,000 winter steelhead, and ~100,000 summer steelhead smolt for harvest in popular inland mark select sport fisheries on the North Coast, as well as sport and commercial ocean fisheries. The hatchery also provides spawning and rearing for important STEP programs such as the ~100,000 smolt Nestucca Anglers Rhoades Pond Fall Chinook Program. The hatchery regularly meets production goals for most stocks but has fallen below production needs for STEP fall Chinook in some years. The STEP fall Chinook broodstock collection partially relies upon fish collected by volunteer anglers to meet these production needs.

## **Passage/Screening**

### **Passage**

#### ***Selective Barrier***

When the weir panels on Three Rivers are in the upright position, the weir is a complete barrier to upstream adult/juvenile migration and downstream adult migration. Volitional adult fish passage occurs at high flows when the hydraulic

barrier drops for safety reasons and during some other periods (primarily in the fall) when hatchery fish are generally not present in the system and the weir can be lowered. Unmarked fall Chinook, winter steelhead, coho, chum, and cutthroat trout caught in the hatchery trap are manually passed up stream. The Coastal Spring Chinook Conservation Plan will address passage of unmarked spring Chinook above the hatchery weir. Unmarked summer steelhead are rare in the Three Rivers as they are considered to be not indigenous to the Nestucca Basin. The weir at the mouth of Cedar Creek is a complete barrier to adult and juvenile upstream passage, but Cedar Creek is considered to be primarily a cutthroat trout stream. There are no barriers associated with the Rhoades Pond STEP program.

### **Screening**

Fish screening on Three River and the primary water intakes on Cedar Creek are NOAA compliant. Auxiliary water supplies on Cedar Creek and the Rhoades Pond STEP facility are NOAA compliant.

### **Legal Mandates and Commitments**

#### **Legal Commitments/Treaty Obligations**

For winter steelhead on the Nestucca River, Cedar Creek is directed by OAR 635-500-5400 to:

- Transition from the current non-local broodstock, to a local broodstock within an interim period.
- Maintain hatchery release of 110,000 smolts per year.  
ODFW is in the process of completing the review of the two stocks relative to stray rates, fishery contribution, residualism, and other factors. Initial results suggest that the locally-derived wild broodstock steelhead out-performed the old Nestucca Hatchery stock relative to the performance metrics. The current program reflects the transition to use of mostly wild broodstock; however, Nestucca hatchery stock are still being utilized to provide angler opportunity early in the season (December-January). Final review of the program will likely occur concurrent with development of the Coastal Winter Steelhead Conservation Plan scheduled to begin in 2010.

#### **Salmon Trout Enhancement Programs (STEP)**

Cedar Creek Hatchery is integral to the local STEP program. Current STEP commitments are as follows:

- Fry for Nestucca Anglers fall Chinook rearing project at Rhoades Pond.
  - Volunteers rear ~100,000 fall Chinook smolts for release into the Nestucca Basin
  - Volunteers assist hatchery staff in collecting adults
  - Cedar Creek Hatchery staff hold and spawn adults
  - Cedar Creek Hatchery staff incubate and start fry on feed
  - Fish transferred to Rhoades Pond for rearing, marking, and release by STEP volunteers.
- Hatchbox program
  - Fall Chinook (2 volunteers – ~50,000 eggs)

- Spring Chinook (2 volunteers – ~65,000 eggs)
- Classroom Incubator Program
  - Eggs provided to several schools for classroom teaching units – ~1,500 +/- steelhead eggs, varies yearly with school/teacher involvement.
- Wild Winter Steelhead Program
  - Volunteers collect adults and deliver to hatchery
  - Cedar Creek Hatchery staff spawn, incubate, and rear the fish to smolt.
- Stream Enrichment Program
  - Cedar Creek Hatchery provides spring Chinook, fall Chinook, winter steelhead, and summer steelhead carcasses for stream enrichment.
  - Watershed councils, schools, and other volunteers participate

### **2.3.5 Elk River Hatchery Evaluation**

Elk River Hatchery annually produces 325,000 fall Chinook smolts for release in Elk River, 150,000 fall Chinook smolts for release in Chetco River, 50,000 winter steelhead smolts for release in the Chetco River, and 7,000 rainbow trout (6,200 legal, 800 trophy) for release into local lakes and ponds.

The Elk River fall Chinook production goal is consistently met. Releases are directly into Elk River with primary objectives to 1) act as an indicator stock for Mid-Oregon Coast Chinook salmon in PST managed fisheries, 2) provide for a robust ocean terminal fishery in the Port Orford area, and 3) provide for a highly utilized recreational in-river fishery. Contribution to fisheries, based on coded-wire tag recoveries, averages 3,705 adults per brood. Approximately 67% are harvested in Oregon fisheries, primarily the commercial ocean terminal and in-river recreational fisheries. On average, approximately 59% of the naturally spawning fall Chinook in Elk River are of hatchery origin. The presence of such large numbers of naturally spawning hatchery fall Chinook has the potential to affect the productivity, and long-term viability, of the wild fall Chinook population.

The Chetco River fall Chinook production goal is consistently met. Releases are directly into Chetco River. Historically the primary objective of the program was to supplement PFMC managed ocean fisheries. With the adoption of restrictive KMZ regulations beginning in 1991 the primary objectives were revised to 1) provide for a late season ocean terminal fishery in the Brookings area, and 2) provide for a highly utilized recreational in-river fishery. Contribution to fisheries, based on coded-wire tag recoveries (ocean) and punch cards (in-river) averages 665 adults per brood of which 80% are harvested in Oregon fisheries. On average, approximately 14% of the naturally spawning fall Chinook in the Chetco River are of hatchery origin. In recent years effort has been made to identify a logistically feasible acclimation site with the objectives being to increase the contribution to the fishery in the lower river, and reduce the proportion of hatchery-produced Chinook in the natural spawning population. Successful implementation of an acclimation site would potentially allow for an increase in production.

The winter steelhead production goal has been met most years. Releases are directly into the Chetco River. The objective of the program is to supplement a popular winter steelhead fishery on the Chetco River. Contribution to the fishery, based on punch cards, averages 762 adults per brood. On average, approximately 14% of the naturally spawning winter steelhead in Chetco River are of hatchery origin (2003-2008 spawning surveys). The program has not met production goals several times in recent years due to higher than expected mortality in the raceways. Additional bird netting has been installed and additional grading implemented in order to address the presumed causes of the shortfall.

## **Passage/Screening**

### **Passage**

No barrier exists to divert adults into the trap. Unmarked coho, unmarked chum, and unmarked steelhead collected in the hatchery trap are released. All marked coho and steelhead collected in the hatchery trap are destroyed. All Chinook are retained for broodstock.

### **Screening**

Fish screening criteria by NOAA Fisheries for anadromous salmonids is for a perforated plate opening not to exceed 3/32 inch in diameter, or a woven wire opening not to exceed 3/32-inch measured diagonally, from April through October.

The intake screening at Elk River Hatchery is 1/8-inch and does not meet NOAA Fisheries criteria; however, use of smaller mesh would be impractical given the nature of suspended debris in Elk River during freshet events.

## **Legal Mandates and Commitments**

### **Legal Commitments/Treaty Obligations**

Elk River Hatchery operates through specific legislative direction to maintain an Oregon coastal salmon hatchery (ORS 506.213). The Elk River fall Chinook stock is a candidate indicator stock for U.S./Canada Treaty. Elk River Hatchery contributes towards broad state commitments in the local area.

ODFW maintains and operates Elk River hatchery specifically to augment salmon fisheries in the Elk River, Chetco River, and Oregon ocean commercial and recreational fisheries. Elk River stock is a candidate exploitation rate indicator (ERI) stock for a proposed mid-Oregon Coast (MOC) Chinook aggregate (pending adoption by the Pacific Salmon Commission). The MOC includes coastal Chinook stocks from the Umpqua south to Elk River. The use of Elk River Chinook as an ERI stock allows annual estimates of the impacts of U.S.-Canada Salmon Treaty fisheries, both aggregate abundance-based management (AABM) and individual stock-based management (ISBM) fisheries, on MOC Chinook stocks and post-season assessment of management success at meeting escapement goals for MOC indicator stock basins. The U.S.-Canada Salmon Treaty requires that only stocks with a history of at least 20 years releasing a minimum of 200,000 marked smolts may be

used as an indicator stock. Elk River stock was chosen as an ERI stock because of its similarity to other MOC Chinook stocks, the presence of a hatchery, and small size of the Elk River Basin. Due to its use as an indicator stock, estimates have been made for all Chinook returning to the Elk River system since 1986. Closure of Elk River Hatchery will result in the loss of this valuable program.

### **Salmon Trout Enhancement (STEP) Program**

Elk River Hatchery is integral to the local STEP program. Current STEP commitments are as follows:

- Classroom Incubator Program
  - o Eggs provided to six schools for classroom teaching units – ~2,200 +/- fall Chinook eggs and 600 winter steelhead eggs.
- Chetco Fall Chinook Program
  - o Volunteers assist with collection (seining) of broodstock for delivery to Elk River Hatchery
  - o Volunteers assist with experimental acclimation projects. In 2006 10,000 Chinook smolts were acclimated in Ferry Creek Reservoir.
- Chetco Winter Steelhead Program
  - o Volunteers assist with collection (angling) of broodstock for delivery to Elk River Hatchery
- Stream Enrichment Program
  - o Elk River Hatchery provides fall Chinook carcasses for stream enrichment in Elk, Chetco, Euchre, and Brush Creek watersheds.
  - o Watershed councils, schools, and other volunteers participate
- Wilderness Lakes Fish Stocking Program.
  - o Elk River Hatchery provides surplus Chetco winter steelhead for stocking Babyfoot and Vulcan lakes.
  - o Volunteers assist with stocking.

### **2.3.6 North Nehalem River Hatchery Evaluation**

North Nehalem Hatchery annually produces ~100,000 coho salmon smolts for release into the NF Nehalem River, ~130,000 winter steelhead smolts for release into the NF Nehalem and Necanicum Rivers, and ~25,000 fall Chinook for release into the Necanicum River, and ~83,950 trout for release into North Coast lakes. Nehalem Hatchery also provides rearing services for Trask Hatchery coho. Production goals for these programs are consistently met. Coho salmon production at NF Nehalem has been decreased to 100,000 over the recent past in order to meet objectives identified in the Oregon Coastal Coho Conservation Plan. The current production level of hatchery coho continues to provide important ocean sport and commercial angling opportunities. Releases of winter steelhead into the North Fork Nehalem provide for a popular recreational in-river fishery. The hatchery has provided a disabled angler platform that is highly utilized by the disabled community to catch hatchery coho and hatchery steelhead. Production of fall Chinook comes from Trask (34) stock fall Chinook from Trask Hatchery. Releases of fall Chinook into the Necanicum provide a small fishery for Chinook in the Necanicum basin. The rainbow trout production is consistently met and is the primary provider of stocked rainbow trout in North Coast lakes.

## **Passage/Screening**

### **Passage**

#### ***Limited Barrier***

There are no barriers associated with North Nehalem Hatchery.

### **Screening**

Nehalem River Hatchery is 1/8-inch and does not meet NOAA Fisheries criteria.

## **Legal Mandates and Commitments**

### **Legal Commitments/Treaty Obligations**

North Nehalem River Hatchery has no legal, mitigation, or treaty obligations.

### **Salmon Trout Enhancement Program (STEP)**

- Classroom incubators: 500 +/- steelhead eggs, varies yearly with school/teacher involvement.

### **Stream Enrichment Program**

- North Nehalem River Hatchery provides coho and winter steelhead carcasses.
- Watershed councils, schools, and other volunteers participate in carcass distribution.

### **Commitments**

- Provides rainbow trout utilized at the Disabled Fishing Day sponsored by the Tillamook Anglers at Whiskey Creek Hatchery.
- Provides rainbow trout utilized at Camp UKANDU on Smith Lake. This is a summer camp for kids with cancer.
- Provides legal trout for Free Fishing Day activities at Trask Hatchery, Hebo Lake (USFS sponsors activities), and Nedonna Pond where the Hatchery staff put on a program. Additionally, stocking schedules are arranged to provide releases of catchable trout into most District lakes immediately prior to Free Fishing Weekend.

## **2.3.7 Rock Creek Hatchery Evaluation**

At full production, Rock Creek Hatchery annually supplies over 990,000 salmonids for recreational angling opportunity in the Mainstem, North and South Umpqua. The hatchery also produces over 50,000 trout for the area's lakes and impoundments. While coho, Chinook and trout consistently meet production goals, steelhead are difficult to rear on site. Problems with steelhead rearing stem from warm water temperatures during the summer which can trigger a wide range of pathogens and diseases which affect steelhead when they are less than a year old.

To compensate for this chronic problem the hatchery installed UV sterilization, ozone treatment and chilling capacity to its hatch house and moved the age 0 steelhead to Canadian troughs inside the hatch house. Rock Creek also sends a portion or all of its steelhead eggs to Cole Rivers Hatchery for rearing to age 1.

## **Passage/Screening**

### **Passage**

All anadromous species have excellent year-round opportunities to migrate upstream in the North Umpqua. The bypass at Rock Creek includes a concrete dam, fishway, and intake. Currently, upstream fish passage is adequate at the dam except at extremely low flows or at very high flows. Fishway design plans have been completed to improve fish passage at all flows and reconstruction scheduled to begin this biennium.

### **Screening**

NOAA Fisheries screening criteria for anadromous salmonids for vertical flat plate screens at the facility are being met. These criteria include the screen opening, face, position, surface, and the approach and sweeping velocity.

### **Legal Commitments/Treaty Obligations**

Rock Creek Hatchery operates through special legislative direction and mitigation agreements. The Umpqua basin Chinook production also contributes to the broad state commitments to the Pacific Salmon Treaty.

- Rock Creek Hatchery fulfills mitigation obligations for Douglas County's Galesville Dam FERC License for South Umpqua basin coho.
- Rock Creek Hatchery also has a FERC mitigation agreement with PacifiCorp for providing 80,000 wild coho eggs for a research study. The eggs will be used from 2009 – 2011.
- Rock Creek Hatchery also has a mitigation agreement with PacifiCorp for producing a native stock of rainbow trout. These trout will be used for stocking Diamond, Lemolo and other high Cascade lakes in the upper Umpqua basin.

### **STEP Programs**

Current STEP commitments are as follows:

- Commission-approved hatchbox program for fall Chinook.
- High lakes fish stocking program for Umpqua Basin.
- Fall smolt releases of fall Chinook from eggs provided by the Gardiner-Reedsport-Winchester Bay STEP program...
- Professional technical assistance for the Umpqua basin STEP program.
- Classroom Incubator Program for numerous classroom incubators in Douglas County and the Eastwood Elementary School Hatchery on Deer Creek (South Umpqua.)
- In the future the hatchery will have an educational, "RockEd" classroom on site. Multiple learning opportunities will be available for teachers.

## **2.3.8 Salmon River Hatchery Evaluation**



Salmon River annually produces 200,000 fall Chinook smolts for release in Salmon River, 200,000 coho salmon presmolts for release in Youngs Bay, 80,000 summer steelhead smolts released in the Siletz River and 24,500 legal sized rainbow trout. The fall Chinook production goal is consistently met and is released directly into Salmon River with a primary objective to act as an indicator stock for Oregon north migrating Chinook salmon in the commercial fisheries off Alaskan and Canada. This program provides the state with valuable information on harvest levels of Oregon coastal Chinook populations in the northern sport and commercial ocean fisheries. This release also provides for a highly utilized and popular recreational in river fishery. The annual coho production is met consistently with a primary objective to supplement ocean recreational coho fisheries the commercial fishery in Youngs Bay on the lower Columbia. The summer steelhead production goal has been met most years. It provides the primary fishery for anadromous fish in the Mid-coast during the summer and the fishery could not be supported by the wild population. The brood stock is valuable for conservation due to its origin from the only wild summer steelhead population in the Oregon Coast Range. The rainbow trout production is consistently met, often exceeding fish size expectations, and is the primary provider of stocked rainbow trout for the Lincoln City area.

## **Passage/Screening**

### **Passage**

The electric barrier located above the hatchery intake is no longer in operation. The remaining structure includes a concrete apron that may restrict upstream passage during periods of low flows in late summer.

### **Screening**

Fish screening criteria by NOAA Fisheries for anadromous salmonids is for a perforated plate opening not to exceed 3/32-inch in diameter or a woven wire opening not to exceed 3/32-inch measured diagonally. The screening at Salmon River Hatchery is 1/8-inch and does not meet NOAA Fisheries criteria.

## **Legal Mandates and Commitments**

### **Legal Commitments/Treaty Obligations**

The Salmon River Hatchery operates through treaty obligations under the U.S.-Canadian Salmon Treaty.

Fall Chinook from Salmon River Hatchery have been chosen as an indicator group to represent all north-migrating Oregon coastal fall Chinook in ocean harvest management under the U.S.-Canadian Salmon Treaty on salmon fisheries because of its similarity to other north-migrating Chinook stocks, the presence of a hatchery, and the small size of the Salmon River Basin. Due to its use as an indicator stock, estimates have been made for all Chinook returning to the Salmon River system since 1986.

### **Salmon Trout Enhancement Program (STEP)**

STEP program needs could be met at another facility with moderate modifications. Current STEP involvement includes:

- Schooner Creek Fair
  - STEP Educational display with juvenile salmonids
- Stream Enrichment Program
  - Salmon River provides carcasses for distribution to selected streams
  - Watershed Councils, schools and other volunteers participate
- Summer Steelhead Program
  - Volunteers assist ODFW staff with Siletz trap operations

### **2.3.9 Trask River Hatchery Evaluation**

Trask Hatchery annually produces ~100,000 coho salmon smolts for release into the Trask, ~245,000 spring Chinook for release into the Trask and Wilson rivers, ~113,000 fall Chinook for release into the Trask River, and ~100,000 Wilson River (121 stock) winter steelhead smolts for release into the Wilson River. Trask Hatchery also provides rearing and release for ~80,000 Nestucca (47 stock) winter steelhead (Wilson and Kilchis release) and ~30,000 summer steelhead (Wilson release). Production goals for these programs are consistently met. Coho salmon production at Trask Hatchery has been decreased to 100,000 over the recent past in order to meet objectives identified in the Oregon Coastal Coho Conservation Plan. The current production level of hatchery coho continues to provide important ocean sport and commercial angling opportunities. The spring Chinook program provides the only available fish for harvest as the wild population is small and the fishery is managed as a mark-select fishery. The fall Chinook program augments an extremely popular bay and river fishery. Releases of winter steelhead into the Wilson and Kilchis basins provide for popular recreational in-river fisheries. The Wilson River (121 stock) winter steelhead program, which began with the collection of adult brood stock during the 1996-97 return year, has grown to be an extremely popular fishery with Wilson River anglers..

### **Passage/Screening**

#### **Passage**

##### ***Complete Barrier***

Gold Creek has two barriers: (1) a horizontal finger apron rack with a concrete foot and an associated fish ladder to the adult trap; and (2) a concrete barrier at the upper water intake. No anadromous fish are passed above the hatchery barriers on Gold Creek at this time. Cutthroat trout are present above barrier.

#### **Screening**

Trask River Hatchery and Tuffy Creek intake screens have 1/8<sup>th</sup> and 3/32 slotted plate which do not meet NOAA fish screening criteria. Trask Pond has 3/32 screens which do meet NOAA fish screening criteria.

## **Legal Mandates and Commitments**

### **Legal Commitments/Treaty Obligations**

Trask Hatchery has no legal, mitigation, or treaty obligations. There is no direct research associated with the facility.

### **Salmon Trout Enhancement Program (STEP)**

Trask Hatchery is integral to the local STEP program.

#### **Hatchbox Program**

- Fall Chinook (multiple volunteers – 280,000 fall Chinook; eggs total)
- Spring Chinook (multiple volunteers – 65,000 spring Chinook eggs total)

#### **Classroom Incubator Program**

- Eggs provided to five schools for classroom teaching units – 2,000 +/- Chinook eggs; varies yearly with school/teacher involvement.

#### **Whiskey Creek Hatchery**

- Volunteers raise 100,000 spring Chinook for release into the Trask and Wilson rivers.
- Trask River Hatchery staff trap, hold, and spawn adults.
- Trask River Hatchery staff incubate eggs and transfer eyed eggs to Whiskey Creek Hatchery. Trask hatchery staff conduct final rearing and release for a portion of the Whiskey Creek spring Chinook production

### **Stream Enrichment Program**

- Trask River Hatchery provides spring Chinook, coho, and fall Chinook carcasses for distribution throughout the Tillamook Bay Basin.
- Watershed councils, schools, and other volunteers participate.

### **Commitments**

- Trask River Hatchery staff sponsor a Free Fishing Day event at the hatchery which targets youth angling. Trask Hatchery is also the site of an angling event for kids from the local YMCA.

## **2.4. Deferred Maintenance Status**

### **2.4.1 Alsea Hatchery**

The hatchery water is supplied from the North Fork Alsea River, upstream from the hatchery. The water is gravity fed into the site and low water flows are experienced during winter and summer months. For the most part, the intake area was updated in the mid-1970s and is operational. Aluminum bars were replaced 12 years ago and are in good condition. The hoist was replaced in 2008. The site drawings show a specific boundary line around the main portion of the hatchery totaling approximately 12.5 acres. Both the concrete paved vehicle areas and the concrete

paved walked surfaces have some minor surface cracking and should be repaired before the damage escalates. In addition, there are gravel vehicle surfaces that need additional gravel. For the most part, the grating is in good condition; there were only a few instances of rusted or broken grating. All of the metal valves are leaking to some extent. There were only two 18" extra-large metal valves that were mentioned and they are at the intake area. The concrete rearing raceways are leaking and seeping water and the concrete is marginal. There are two settling ponds. The concrete settling pond is no longer used. It is too small, the sides are starting to bow out, sinkholes are developing and the entire pond is compromised. The other settling pond is an asphalt pond and it is in questionable condition. The pond has holes, cracks, leaks and the bottom is coming up. Generally, there is plenty of visitor parking and easy access around the site.

**Buildings:**

The following buildings were assessed as part of the maintenance master plan: Residence#1 (02001), Residence#2 (02002), Residence#3 (02003), Residence#4 (02004), Garage Tank and Storage Building (02011/02018), Hatchery Building (02013), Hatchery Office (02015), Cold Storage/Grinder Room (02016), Spawning Shed (02017), and Metal Storage Building (02019).

The first residence, Residence #1 (02001), was built in 1948 and has a crawl space, wood framed walls, and wood siding. The wood siding needs to be scraped and repainted and the eaves have dry rotted. The residence has an asphalt-shingled roof and although both the roof and exterior roof drainage components were replaced in 1980, the roof is still in good condition. The windows were replaced in 2010. The concrete stairs are chipped down to the aggregate and need to be patched. The front porch is also original to 1948 and needs to be refinished.

Residence #1(02001) is in very good shape and requires no repair work at this time. The wall surfaces are mostly wallboard, with a small application of wood paneling. The ceiling surfaces are primarily wallboard, with a minimal amount of adhered ceiling tile. All of the doors are original. The carpet was just replaced in 2003 and the resilient flooring in 2000. The casework is brand new, installed in 2005, along with the plumbing fixtures. The house has an oil-fired furnace and a wood stove for heating. The furnace is very old and inefficient and should be replaced with a heat pump. Eliminating the diesel furnace will eliminate the need for underground fuel storage tank associated with the furnace. This residence has an unattached free standing garage with a slab on grade construction. Slab is severely cracked in multiple locations due to ground settling. The building has a slight list to it resulting in multiple structural concerns.

The second residence, Residence #2 (02002), was built in 1934 and has a crawl space, wood framed walls and wood siding. The resident mentioned that the floor joists are rotting and he has already had to do maintenance repair. The vertical structure seems to be in good condition, but the wood siding, trim and eaves needs to be scraped and repainted. The building has an asphalt-shingled roof and both the roof and the exterior roof drainage components were replaced in 1997, and everything seems to be in good condition. All of the wood doors are original and need to be

phased out. In addition, the residence has little insulation and needs some form of insulation installed. The concrete stairs are chipped and cracked and need some minor repair.

Residence #2 (02002) is also in good condition considering its age. The walls are mostly wallboard and wood paneling. The ceilings are all wallboard. The carpet was replaced in 2005 and resilient floor tile was replaced in 1995. The doors are all original, as is the casework. There is an oil furnace and a woodstove for heat. The furnace is inefficient and should be replaced with a heat pump. Eliminating the diesel furnace will eliminate the need fuel storage tank associated with the furnace. The water heater was replaced in 2004.

The third residence, Residence #3 (02003), was built in 1934 and has a crawl space, wood framed walls and wood siding. The wood siding was replaced in 1987. The building has an asphalt shingled roof and exterior roof drainage components that were replaced in 2003. All of the wood doors are original to 1934 and should be eventually phased out. The house has little insulation and insulation in some form needs to be installed. Originally this was a two-family house that was converted into a single-family house.

The interior is primarily surfaced with wallboard on the walls and ceilings. The carpet was replaced in 2005 and the resilient flooring was replaced in 1990. Both the casework and the doors are all original. The furnace is inefficient and should be replaced with a heat pump. Eliminating the diesel furnace will eliminate the need two underground fuel storage tanks associated with the furnace. There is a wood stove as well. The hot water heater was replaced in 1995.

The fourth residence, Residence #4 (02004), was built in 1962 and has a crawl space, wood framed walls and wood siding. The wood siding is peeling and needs to be scraped and repainted. There is also some dry rot to the wood siding and the eaves are dry rotting as well, such that the roof accessories won't stay attached to the building. The windows were replaced in 1993 and are in good condition. All of the doors are in bad shape and need to be replaced. The patio area was just refinished in 2004. Overall, the exterior building envelope seems to be in good shape.

Residence #4 (02004) is in very good condition. All of the interior surfaces are in excellent condition. The carpeting was replaced in 2003. The flooring in the master bedroom and hall was replaced in 2009 but the rest of the house is in need of new flooring. The casework is original from 1962 as are the doors. The furnace is very old and inefficient and should be replaced with a heat pump. Eliminating the diesel furnace will eliminate the need for underground fuel storage tank associated with the furnace. The house has one wood stove installed in 2005. The hot water heater was replaced in 2005.

The Garage and Tank Storage building (02011/02018) was listed as separate structures with separate numbers, but in reality it is one building with two separate interior spaces, one tank space and one storage space. The building was built in 1934 and is a slab-on-grade, wood framed and wood sided structure. The siding,

windows, doors, roof and gutters were replaced in 2009. The Garage Tank and Storage Building has a completely unfinished interior original to 1934.

The main Hatchery Building (02013) was built in 1934 and is a slab-on-grade, wood framed and cladded building envelope. Approximately 20% of the foundation walls are cracked, with multiple chipped areas. The siding, windows, doors and gutters were replaced in 2006. The metal roof has been replaced within the last fifteen years along with the exterior roof drainage components and is in very good shape.

Within the Hatchery Building (02013), the finished interior spaces, like the building exteriors, vary in age and condition. In the main hatchery room and shop space, there is an original tongue and groove wood finish that is in good condition. The painted wood ceiling surfaces in these spaces are starting to deteriorate and need some repair work. The concrete floors are unfinished and show minor cracking. The space has two restrooms, one employee restroom and another ADA restroom that is only accessible from an exterior entrance. Both of the restrooms only have a ceiling height of 6'-1", and are not up to current building codes. Other than that, both restrooms were remodeled in 1995 and are in good condition. The ADA restroom has some adhered ceiling tiles that are stained. Upstairs there is an unfinished attic which is used for storage, and two employee break room spaces. These spaces are in good shape.

The Hatchery Office Building (02015) was built in 1934 and is only 306 ft<sup>2</sup>. It is a slab-on-grade, wood framed and cladded building envelope. Approximately 10% of the foundation walls are cracked and need to be repaired. The siding was replaced in 2006. The metal roof and exterior roof drainage components were replaced at the same time as the Hatchery Building, approximately fifteen years ago. The windows are in good condition and were also replaced within the last ten years. Overall the exterior building is in decent shape.

The Hatchery Office (02015) has just one interior space that is in very good shape. The interior walls are wood paneling and exposed concrete and the ceiling surfaces are adhered tiles. The resilient flooring needs to be replaced. The space has an electric wall heater.

The Cold Storage/Grinder Room building (02016) was built in 1934 and is a slab-on-grade, wood framed and cladded building envelope. The siding, windows, doors and gutters were replaced in 2006. The metal roof and exterior roof drainage components were replaced at the same time as the Hatchery and Office Buildings, approximately fifteen years ago.

The Cold Storage/Grinder Room building (02016) has primarily three interior spaces, one for equipment storage, one for fish food storage, and the other is attic storage. For the most part, the finishes are exposed concrete. The remaining surfaces could use some cosmetic touch-ups such as repainting. This building does not have heat.

The Spawning Shed (02017) was built in 1971 and is basically a shed type building that is open to the elements. It is a slab-on-grade and slab-below-grade structure

and has about 50% foundation walls and 50% wood framed and wood clad walls. The metal roof, exterior roof drainage components, window and door were replaced in 2008. The interior space is open to the elements and is completely unfinished.

The Storage Building (02019) is a slab-on-grade metal storage shed that was erected in 1996. Nothing significant has been changed to the building since it was put on site in 1996. The interior is metal and is also unfinished.

## **ADA:**

Alsea River Hatchery staff site are typically with tourists that come out to the hatchery and are available to assist any handicapped person get through the tour. The main Hatchery Building (02013) is not open to the general public unless a tour is being given.

The site has two van-accessible parking spots with appropriate signage, one near the accessible restroom and site, and the other in the general parking area. No ramps or curb cuts are needed at the Alsea site. The entire path of travel consists of rough aggregate and is not completely accessible in all areas. Some of the aggregate is in better condition than other areas, but for the most part, the site pathways should be resurfaced. The Alsea site is primarily flat, although there are slight changes of grade and a proper assessment should be made before any upgrades are considered.

The accessible route to the restroom is aggregate with a minimal amount of asphalt paving. The asphalt directly in front of the doorway to the restroom has a large depression that needs to be filled and resurfaced.

The accessible route to the Hatchery Building (02013) is also aggregate with a minimal amount of concrete directly in front of the building.

The Hatchery Building (02013) contains two spaces that are required to be compliant. The first space, the hatchery room, is only open to tours. Otherwise, it is not open to the general public. There are no major issues in regards to access. The Hatchery Building (02013) also contains an accessible restroom that has another exterior entrance, other than the hatchery door entrance. This entrance need to have the threshold modified, as it is too high.

The main hatchery room has no major compliancy issues except that the concrete fish basins are 38" in height, and can not be modified because they are a part of the floor system. The fish basins create an observable event that would be difficult to view by a person in a wheelchair. As mentioned on the interior summary for the accessible restroom, the ceiling height is only 6'-1" and does not meet current standard building codes and needs to be modified. Otherwise, the interior space of the restroom is compliant.

### **2.4.2 Bandon Hatchery**

### **Engineering/Facilities**

Bandon Hatchery obtains its water supply from Ferry Creek and Geiger Creek. The intake at Ferry Creek has been replaced since 1925, and the intake screens at Geiger Creek have been replaced as well. The water from both sources is distributed to the site by gravity flow systems.

### **Ponds**

There are ten ponds on the site, two of which have been used for abatement ponds. The concrete on each of the rearing ponds is primarily in good condition, but does have a few problems. Pond 06081 is cracking along the walls and floor. Ponds 06087, 06088, 06085, 06084 and 06082 have minor cracks along the walls. Pond 06080 has cracks along the walls and near the supply pipe. Ponds 06088 and 06087 have cracks along the floors, which are more substantial than the cracks found on the other ponds. The condition of the rearing ponds range from very good to poor, with all ponds being functional.

### **Roads/Paths**

The developed areas of the grounds are in good condition overall. One main asphalt road leads to the parking on the site. This asphalt was installed in 2002 and is in excellent condition. Gravel roads lead to the residences as well as the intake. The gravel is in good condition with some areas of grass growing through the gravel. A small amount of asphalt sidewalks exist on the site. This asphalt was installed in 1985 and a portion of it is cracking along the surface. A new seal coat should be installed. A concrete sidewalk adjacent to Residence #1 (06065) is cracking and needs to be repaired.

### **Buildings**

The following buildings were assessed as part of the maintenance master plan: Residence #1, Residence 4 (06068), Spawning Shed (06070), Rearing Tank Building (06071), Cold Storage Building (06072), Hatchery Building (06075), Shop Building (06077), and Storage Building (06079).

Residence 1 (06065), built in 1929, consists of wood siding exterior walls on a slab on grade foundation. The siding was replaced in 1985 and is in good condition. The roof, replaced in 1992, is asphalt shingles and is in good condition as well. The windows were replaced in 2004, and the exterior metal doors in 2000. The garage door was replaced in 1990. A storage shed was also built for the house in 2005. The house is heated via an electric furnace, which is circulated through ductwork. The furnace was installed in 1984 and the ductwork is original to 1929. The power wiring was replaced in 1984 and currently there are no electrical problems in the house. New carpeting, vinyl flooring, and a bathroom renovation (including plumbing) were implemented in 2009. A porch attached to the back of the house was transitioned into an extension to the house in 1985.

Residence 1's (06065) interior has a couple of problems where repairs are needed, but is in overall good condition. The ceiling upstairs is peeling and needs to be repainted. The casework in the kitchen was installed in 1950 and is in very poor



condition. The doors and drawers do not close properly, and the wood is deteriorating. The water heater in the basement needs to be replaced.

**Residence 4** (06068), built in 1955, consists of wood siding exterior walls on a 4 ft. crawl space foundation. A couple of the studs on the north wall of the house were found to have some minor rotting. The roof was replaced in 1992 and is in good condition. The windows were replaced in 1985 and need to have the weather stripping replaced due to dry rotting. A deck was built in 1988, but removed in 2010. This will be replaced with a more practical patio. A storage shed was added in 2003. The heat for the house is generated via an electric furnace and is circulated through the house through ductwork. The electric furnace was installed in 1985, replacing the original oil furnace. Residence 4's (06068) interior is mostly original and is still in good condition. The carpeting was replaced in 2000 and is in good condition. A portion of the sheetrock around the windows was replaced recently. The cabinets are beginning to warp around the sink.

**Residence 2** (06066), was included in the scope to be inspected. The building, built in 1937, is currently in a very poor condition. It is uninhabitable and is only open on one side to allow access to the laundry room. The water is still hooked up to the building and the washer and dryer are used by hatchery hosts. The house is planned for demolition, but not presently scheduled for that project. Once demolished, a laundry facility needs to be installed.

The **Spawning Shed** (06070), built in 1983, consists of wood siding exterior walls on a slab on grade foundation. The metal roof and siding are original to the building and are in good condition. There is no heat supplied to the building. The interior of this building is completely unfinished with no problems to report.

The **Rearing Tank Building** (06071) (a.k.a. the "E Building"), was built in 1991. The building consists of wood siding exterior walls on a slab on grade foundation. The asphalt shingle roof and siding are original to the building and are in good condition. There is no heat supplied to the building. The interior of this building is completely unfinished with no problems to report.

The **Cold Storage Building** (06072), built in 1953, consists of wood siding exterior walls on a slab on grade foundation. The siding is original to the building and is in good condition. The asphalt shingle roof was replaced in 1999 and is also in good condition. The exterior wood doors are original, and two of the doors need to be replaced due to deterioration. The only hardware the doors have is a metal latch to lock the door. Doorknobs and locks should be installed. The compressor for the cold storage was replaced in the late 1980's and has since been decommissioned. The building is no longer used to store moist food and instead is used as general storage. One interior space is heated via electric radiation. The interior of this building is completely unfinished with no problems to report.

The **Hatchery Building** (06075), built in 1934, consists of wood exterior walls on a slab on grade foundation. The wood siding was replaced in 1995 and is in good condition. The asphalt shingle roof was also replaced in 1995 and is in good condition. Other items replaced in 1995 include the gutters, windows and wood

exterior doors. Overall, the exterior of the Hatchery Building is in good condition. The only concern currently is the foundation appears to be settling at a faster rate on the north end of the building. There is no immediate action required for this but is something that needs to be documented and monitored. A portion of the building is heated via electric radiation and was installed in 1994.

The Hatchery Building's (06075) interior is mostly unfinished and in good condition. The worn attic floor was covered in 2009. The office was refurbished in 1995 including new wood paneling for the walls, painted sheetrock for the ceiling and vinyl flooring. The lighting throughout the hatchery was replaced in 1993.

The **Shop Building** (06077), built in 1978, consists of wood exterior walls on a slab on grade foundation. The roof was replaced in 2006. The building is heated by overhead electric radiation. The interior of this building is completely unfinished with no problems to report.

The **Storage Building** (06079), built in 1998, consists of metal exterior walls on a slab on grade foundation. The metal roof is original to the building and is in good condition. The building is relatively new and has no problems to report. There is no heat supplied to the building. The interior of this building is completely unfinished with no problems to report.

**Ferry Creek Spillway** proved to be inadequate in the "1964 Flood" and other recent major storm events. It is currently only 7' wide and needs to be engineered and expanded. Although it has been repaired, it is deteriorating, leaks, and is causing undermining of the dam.

### **Americans with Disabilities Act (ADA) Compliance and Public Accessibility**

There is adequate handicap-accessible parking at Bandon Hatchery. The parking is located adjacent to the Spawning Shed (06070). Paths leading from the parking area to the Spawning Shed and ponds are mostly ADA compliant. The specific portions of these paths that are not ADA compliant are: The path leading from the parking to the adjacent **Public Restrooms** is too steep. An ADA compliant path (concrete/asphalt/aggregate) should be installed leading directly to the restrooms. Another portion of the paths that is not compliant is at the **Rearing Ponds** (06080, 06081). The current path leading around the perimeter of these ponds is only 18". The path needs to be widened to at least 36". The final problem with the paths is at a ramp leading up to a walking bridge that crosses the creek. There is a 2" lip where the ramp meets the wooden bridge. This lip needs to be removed to make the path ADA compliant.

The only building on the site that is open to the public is the **Spawning Shed** (06070), and there are no problems regarding ADA compliance with this building.

### **Public Restrooms**

Public restrooms on the lower hatchery grounds are currently inadequate. Two portable, plastic restrooms are provided for public use. The lower grounds are within the floodplain of Ferry and Geiger creeks, and as such, the installation of permanent restrooms has been difficult to accomplish. There is a need for a site

inspection by DEQ and County personnel, to assist in developing options for the installation of permanent restrooms.

### **2.4.3 Butte Falls Hatchery**

The site has ample guest parking and also features a large park area that can accommodate large gatherings. Recently brought back into full operation, the hatchery gravity intake structure was refurbished in 2004, and equipped with a compressed air screen cleaning system. Water is piped from the intake approximately 1/2 mile downstream to the hatchery. The pipe crosses over Butte Creek on a small bridge. The footings that the bridge pillars sit on have begun to wash out due to minor flooding. This bridge should be inspected by an engineer to determine if it is still structurally sound.

Though functional, the site has several issues that need to be addressed. A majority of the concrete and paved surfaces are badly weathered, including vehicular and pedestrian surfaces. There is also a major drainage problem on the site. Periods of heavy rain create a wash that runs down the walkway of residence 15112 into a pool in the back yard.

The rearing raceways are in a variety of conditions. Two raceways were refurbished in 2003 and are in excellent shape while some of the raceways dating from the 1930's have crumbled into a state of uselessness. Additionally, the retaining wall located at the end of this set of raceways is failing and needs to be replaced. All other raceways, other than the two that are newly refurbished, have sections of severe cracking and deterioration. The valves used for water distribution to the raceways are being replaced in an on going process. In addition the settling ponds were slated for replacement in 2006.

The domestic waterlines on site are undersized and routinely fail. Made up of old galvanized piping, the distribution lines often rust through and demand repair. The irrigation system on site is fed from the main intake pipe for the hatchery water system. Low pressure in the lines only allows for one sprinkler head to be used at a time.

The site also has a number of underground storage tanks that are not in use. For many of the tanks the location, condition, and date abandoned are unknown. Many of the underground heating oil tanks were replaced with above ground units, a few of which should be evaluated for stability.

Also of note was the inclusion of Residence 15110, which is no longer in use due to poor water quality. This residence is not located at the hatchery site, rather at a former egg-taking station on Butte Creek.

## **Buildings**

The following buildings were included as part of the maintenance master plan: Hatchery Building (15014), Office Building (15028), Wood Shop (15034), Shop (15036), Storage Building (15037), Cold Storage/Grinder Room (15038), Residence #1 (15111), Residence #2 (15112), Residence #4 (15113), and Residence #5 (15114). The remaining buildings are associated with the above buildings: Storage (15029), Garage (15033), Garage (15039), Carport (15040), and Garage/Shop (15055).

The Hatchery building (15014) is in excellent shape and requires no action at this time. The wood framed structure built on a slab on grade foundation with masonry walls has been well maintained. Recently resided with vinyl siding and having undergone a window replacement in 1994, the building envelope is in the best shape of any building on the site.

The Hatchery Building recently had the main head pipe replaced. The unfinished walls and concrete floor are in good condition. The tank room has several built-in concrete tanks, which seep water onto the floor, though no cracks were apparent, thus an action item has not been indicated.

The Office building (15028) is a wood framed structure on a crawlspace foundation. The building is currently not in use; however, staff would like to see it turned into a visitor's center. In order for this to take place several issues will need to be remedied. The root system of an adjacent tree has undermined the foundation and cracked it, causing the whole structure to slope to the rear. In addition the roof and exterior paint are extremely weathered and a broken window needs to be fixed.

The interior is quite small and has been divided into three rooms, a small restroom, office, and lobby area. The restroom is plumbed but staff has indicated that there is no need for the restroom any more and the fixtures can be decommissioned. All interior finishes are in good shape except for the vinyl floor, which is chipped and spreading at the seams.

The Wood Shop (15034) is a large wood-framed structure with a slab on grade foundation and partial masonry walls. Functionally sound, the main structure is heated by wood stove and houses all of the woodworking equipment. There is a garage (15033) which is used for storage adjacent to the main building. The garage is structurally unsound due to a damaged foundation, requiring total replacement of the building.

The structural integrity of the main building (15034) is sound, though it is showing its age. The chimney is crumbling and needs to be replaced, the window frames need to be repainted and sealed, and the concrete landings outside the main entrance have cracked laterally and need to be replaced.

The Shop (15036) is a wood framed structure with a slab on grade foundation and partial masonry walls. It is currently being used for storage. The buildings exterior paint is blistered and peeling. The exterior walls and window frames need to be scraped and painted.

The Storage building (15037) is a wood framed structure with a slab on grade foundation. Masonry walls rise 2' above the foundation and meet with the wood

frame. The structure serves as a storage area and visitor bathrooms. Though structurally intact, the building is in need of some repair. The exterior paint on the walls doors and windows is blistered and flaking off. The masonry walls are chipping and crumbling away, and one of the windows is broken.

The interior consists of an unfinished storage area and two finished restrooms that have been added to the north end of the building. The storage area ceiling paint is flaking off in one-inch sections and needs to be repainted. The restrooms are in good condition, with the exception of one 1'x1' hole that has been punched through the GWB finish in the west restroom.

The Cold Storage & Grinder Room building (15038) is a combination of two wood-framed slab-on-grade structures with partial masonry walls. The building consists of the former grinding room and decommissioned freezers, which currently house a shower used as an emergency eyewash/shower and storage space.

Both sections of the building are in good condition, however several window pains are cracked. All window frames need to be painted and sealed. The concrete pad outside the entrance is cracked laterally and wearing away. The doors need to be repainted. In addition the doors are not wide enough for the forklift to get through, requiring all food pallets be restacked by hand inside the storage area.

The Cold Storage & Grinder Room building (15038) interior is in fair condition. The unfinished concrete floor requires no action, however the ceiling and walls in the grinding room are extremely weathered and the plaster and paint are peeling off in sheets. The decommissioned freezers have masonry walls and ceilings that are not in need of any action.

Residence 1 (15111) is a three level wood framed full basement structure with a garage. One side of the building was recently resided with vinyl however the rest of the structure is still clad in the original cedar siding. In good condition overall, there are a few issues that need to be addressed, mainly in the basement area.

Overall, the vertical structure is in great shape, however, the concrete stairs on the outside of the structure are weathered and need to be resurfaced. In addition, the garage has three broken windows and a cracked foundation.

Residence 1 (15111) is currently being remodeled. The attic area has been finished in GWB, however the poor quality or original installation requires that it be re-taped and finished. Originally only one bedroom was in the attic, however a bathroom and bedroom have been recently added. The main floor has wood flooring throughout and aside from needing to be refinished in some areas is in good condition overall.

The building sits atop a spring, which requires sump pumps be run constantly. The pumps keep up with the flow of spring water; however there have been instances where pump failure or drainage issues have led to knee-deep water accumulating in the basement. In addition the moist environment, both interior and exterior, has taken a toll on the basement windows, rotting out the wooden frames. The GWB in the basement bedroom suffers from the same shoddy installation job as the attic and

needs to be refinished. Until there is a permanent solution to the flooding problem the degradation on interior finishes in the basement will be accelerated.

Residence 2 (15112) is a wood framed structure with a crawlspace basement. The garage listed in conjunction with this structure has been converted to an enclosed storage shed. A deck has recently been added to the back of the building and a new fence encircles the yard. The structure is in good shape overall but suffers from a few minor issues including loose bricks at the top of the chimney, a broken window, and concrete patios that are worn and need to be resurfaced.

As mentioned in the site summary, periods of heavy rain flood the back yard and create a wash running down the walkway leading to the building. In addition the storage shed has a few broken windows that need to be replaced and currently supports an ant infestation.

Residence 2 (15112) has a carpeted main floor and a finished attic area. Most of the systems in the buildings interior are in good condition, however carpet is worn and frayed, the countertops in the kitchen are losing their finish, and there may be some issues with the wiring. Although the wiring is still functional, staff indicated that an electrical inspector showed concern about the age of the wiring and recommended the building be rewired.

Residence 3 (15110) is located off the main hatchery site and is no longer in use due to poor well water quality. The building is boarded up. An inspection of the interior was not possible, however staff indicated the finishes were in “good shape” when last they looked.

Residence 4 (15113) is used as an office and is in excellent condition overall, requiring no action to the building envelope. Residence 4 (15113) is a one story residence with a laundry room, kitchen, living area, bathroom, and bedrooms that have been converted to office space. The main living area has hardwood flooring that has been painted over. The paint in this area is wearing off and the floor needs to be stripped and refinished or repainted. In addition the GWB is in need of a coat of paint throughout.

Residence 5 (15114) is a wood framed structure on a crawl space foundation. Well maintained, only a few minor issues need to be addressed. Isolated areas of the painted cedar siding have begun to peel and need to be scraped and painted. A metal roof, installed in 1994, has an ongoing problem with the screws that fasten it in place. For unknown reasons the screws continually back completely out of the roof, requiring a regular screw maintenance routine every few months. As determined through the interview, the correct type of roofing screws was utilized.

Residence 5 (15114), like the other residences on site, is in good condition overall. The building shares the same layout as residences built during the mid 50’s at Klamath Hatchery, Oak Springs Hatchery, and a few other hatchery sites. The upstairs interior GWB needs to be re-taped and finished, additional GWB finish work is needed in the garage. The wood stairs leading to the upper floor above the garage could also use a coat of paint.

The main issue that demands the most attention in this residence is the electrical system. Although the system is currently working, the 100-amp service is undersized and the breaker for the water heater trips randomly. Currently the electrical capacity of the house appears to be low.

## **ADA**

Butte Falls Hatchery is a very difficult site to maneuver around. The site terrain is all rough aggregate with steep grades and difficult to reach building locations. More parking areas are needed so access is more easily obtained. Re-grading the site is essential to accessibility and compliancy. Currently, I would suggest, if re-grading is not possible, then at least three more accessible parking spaces need to be distributed around the site to make travel more accommodating. The parking spaces need to be near the portable restroom, the old office, and the rearing raceways.

There are three buildings that need to be ADA accessible, the office space (15113), the old office building (15028) and the portable restroom. The current hatchery office is located in an older residence and the exterior entrance is completely inaccessible. A ramp would have to be provided, as well as a new door, new threshold, etc. to make the space compliant.

The old office space (15028) would need a modified threshold and a new handle for accessibility. Although the building is currently not open to be public, the intent is to turn the interior into an interpretive center.

Even though the restroom facilities are not accessible, an ADA portable toilet is provided adjacent to the restroom building. The inaccessible restroom needs to have tactile directional signage.

### **2.4.4 Cedar Creek Hatchery**

The hatchery is located 1.5 miles east of Hebo on Highway 22 and is adjacent to Three Rivers. Cedar Creek Hatchery was established in 1925 and is comprised of three areas. In addition to the main hatchery area, there is the Three River Fish Trap, which is across Highway 22 from the hatchery, and a satellite facility at Rhoades pond, which is approximately three miles south on Highway 22. Rhoades Pond is not currently operated by ODFW; it is leased to a local angling group. The goal of this hatchery is to provide spring Chinook, fall Chinook, winter steelhead, and summer steelhead for consumptive fisheries on several coastal streams.

Cedar Creek Hatchery has three intakes at the main hatchery – two at the hatchery and one across Highway 22 at the Three Rivers fish trap (29221). The upper and lower intakes are gravity feed systems, on Cedar Creek, and are original to the hatchery. The upper intake is coupled with a small sand trap. The intake at the Three Rivers fish trap has pumps and can be used to supply river water to the

hatchery at times of low water. Another intake is at Rhoades pond, and is a simple diversion into an open culvert. Screening is in place with a fish bypass pipe back to the river. There are no valves, screen or other mechanics at the Rhoades Pond intake. The intakes are all functioning properly.

Primary concerns at Cedar Creek are the replacement of faulty valves. Also, there is an apparent water pipe leak between the Three Rivers Fish Trap Building (29221) and the highway, which is evident when large amounts of water are diverted to the trap from the upper intakes. A pump station and pipeline were installed in 2008 that addressed most of the rearing pond effluent concerns. Waste water can now be diverted to a large, unused rearing lake for settling and dilution. The site utilities include electrical service and domestic water lines. The electrical service is provided to individual buildings by the local utility (i.e. there is no site-wide ODFW owned electrical distribution system). The electrical utility controls site distribution until the power lines terminate at a building meter. The domestic water for the facility is conditioned by a water softener system in a pump house near the Hatchery Building (29239). There were no reported problems with the domestic water system.

### **Buildings:**

The buildings assessed at this site include: Utility Building (29229), Pole Barn #1 (29231), Pole Barn #2 (29233), Electrical Building (29238), Hatchery Building (29239), Cold Storage/Office Building (29249), Garage/Shed/Shop (29255), Residence #1 (29273/29251), Residence #2 (29274/29242), Residence #3 (29275), Residence #4 (29276), Spawning Building (29221), and Mobile Home-Silvercrest (29277).

The Spawning Building (29221) at Three Rivers was built in 1970 and is in fair condition. The building covers and encloses the fish ladder and pools for fish trapping.

The Pole Barn #1 (29231) at Rhodes is relatively new and is in good condition.

The Cold Storage/Office Building (29249), Pump House (29223), and Pole Barn (29233) are newer buildings and in good condition. The offices in the Cold Storage/Office Building were remodeled in 2001. The roof was replaced in 2006.

In general, the residences are in good condition as many have been remodeled in the last ten years. Residence 3 (29275) was relocated to the site in approximately 1947. Reportedly, the building originally had a flat roof. The structural support for an added gable roof is visible outside the building. It is not clear how or if this roof foundation is attached to the original foundation walls. Residence 3 (29275) was enlarged in 2001. In addition to the residences, older site buildings include the Hatchery Building (29239) and a Gas Shed (29237). These have been well-maintained and require only routine maintenance and upgrades. An above ground storage tank for gasoline was installed in 2009.

The Residence #4 (29276) and garage at Rhodes pond have not been occupied for approximately six years and are showing evidence of rodent infestation and deterioration. Both of these buildings have deteriorated beyond repair.



**Life Safety:**

No life safety issues were reported.

**ADA:**

The driveways have rough surfaces of paved asphalt and gravel and do not provide accessible paths through the site. The asphalt paving does not actually extend to the Cold Storage/Office (29249) building, and the gravel path is not compliant. Since this building is the only public building and restroom on the site, paving should be extended to it and an ADA parking space should be provided. The site and route into the building require directional signage. A ramp has been recently constructed which allows visitors access to the building. The slope of the ramp is compliant but it is over 30 feet long and there is no landing. It appears that there is sufficient run to install a landing and still have compliant slope. The ramp also needs a handrail. The designated restroom in the building is accessible and complies with the review criteria.

**2.4.5 Elk River Hatchery**

**Fish Rearing Water Supply:** Overall condition very good.

Four, 40 hp line-shaft turbine pumps through a screened intake deliver the entire hatchery rearing water supply from Elk River. Although all intake pumps were refurbished in 1996, one of the intake pumps (#7) has damaged seals and should be refurbished soon. The intake alarm system, motor controls and switch gear were replaced in 1996 and 1997, and all are sound. The emergency generator switchgear was replaced in 1999 and is sound and reliable. The old wooden plank deck at the intake was replaced with gripstrut in 2006. Three of the four 12" plug valves were replaced in 2009. A leaking 24" blowout valve and pipeline system near the rearing ponds was replaced in 2010. Water supply headers from the intake to the rearing ponds are sound and do not leak.

**Incubation Water Supply:** Overall condition good to very good.

Incubation water supply is pumped from a sub-surface well with a 7.5 horsepower line-shaft turbine pump. The pump motor was replaced in 2008. The screened incubation headbox, pipelines, valves and alarm system are all sound. Fiberglass incubation stacks are original to the facility and should be replaced over time due to degradation.

**Adult Collection and Holding Facilities:** Overall condition very good.

Adult trap and holding facilities for Elk River fall Chinook salmon include a fish ladder, an alley-type trap and 10 separate aluminum-framed holding pens. Two of the rearing ponds (epoxy coated and fenced) are used during winter months as adult holding ponds for Chetco River fall Chinook salmon. A stand-alone building supplied with pathogen free well water houses the polyurethane-coated adult

holding ponds for Chetco River winter steelhead. The 24" valve system in the distribution headbox near the fish ladder was refurbished in 2007. Intruder exclusion and an updated alarm system were installed at the spawn deck in 2008. The aluminum and wood framed trap outlet structure and all of the wooden fish ladder boards were replaced in 2010. All other valves, metal grated valve box covers and fish trap structures are sound.

**Rearing Ponds:** Overall condition good to very good.

Twenty four modified, concrete Burrows-type rearing ponds are on site. Fourteen of the ponds are original 1968 construction and ten more ponds were added in 1971. Rearing pond structure includes sound handrails, some chain-link fence, concrete and gripstrut walking surfaces and predator exclusion devices. Some minor cracks have occurred over the 40+ year use of these ponds, but they all remain useable and should be in service for many years without problems. The gripstrut center walkway was modified to allow easier access to rearing water supply valves in 2008. Some 4" rearing water supply valves leak slightly, but none require replacement. Rearing pond tilt-tubes were replaced over several years, and all are sound. Damaged dam boards are replaced as needed. Electrical circuits, circuit breakers and receptacles have been replaced over time and are sound.

**Domestic Water System:** Overall condition good to very good.

The domestic water system includes a submersible 7.5 hp pump in a sub-surface well which supplies approximately 300 gpm of filtered river water to a 2,500 gallon chlorinated storage tank. A 7.5 hp Grundfos booster pump, five pressure tanks and associated valves and piping deliver treated water to all hatchery buildings, three residences and a host site. The entire domestic water delivery system was upgraded in 1997 and is sound and reliable. Underground pipelines and valves, although useable, are original to the facility and should be replaced over time due to corrosion.

**Buildings:** Overall condition very good.

- Service Building (08030) was constructed in 1968 and consists of CMU exterior walls on a slab on grade foundation. This building houses the main hatchery electrical service panels, wood shop, tool and fabrication space, emergency water pump storage, domestic water system and the stock room. Interior walls are mostly painted concrete block, while the ceilings are painted fiberboard. Floors are all finished concrete. The fabrication space and wood shop are heated with 230 volt, 1500W ceiling mounted heaters. Since 1995 many physical and electrical upgrades have been accomplished including an improved hatchery alarm system, a 100 kVa transformer and emergency generator power supply to operate all hatchery buildings in the event of commercial power failure. The asphalt shingle roof was replaced in 2008. This building is sound and has no problems.

- Hatchery Building (08031) was constructed in 1968 and consists of CMU exterior walls on a slab on grade foundation. This building houses the main offices, egg and fry incubation, feed storage, equipment storage and restrooms. The building is heated with original electric radiation. The interiors are painted cinder block or painted drywall. The feed storage freezer was converted to dry storage in 2006, but the upgraded chiller compressors are still on site and functional. The asphalt shingle roof was replaced in 2008. This building is sound and has no problems.

- Electrical Building (08036) was constructed in 1976 and consists of original wood siding exterior walls and ceiling on a slab on grade foundation. This “power shack” houses the transformer, switch gear, motor control and alarm system components for the intake water pumps, incubation well pump and domestic well pump. The asphalt shingle roof is original and is in good condition. Building interior is unfinished. This building is unheated, but is supplied with an automatic ventilation fan for higher ambient temperatures. This building is sound and has no problems.

- Generator Building (08047) was constructed in 1985 and consists of original wood siding exterior walls and ceiling on a slab on grade foundation. This building houses the 230kW emergency generator which powers all hatchery buildings and water pumps during commercial power failures, tool storage and the main service breakers for the Electrical Building. The wood siding and asphalt shingle roof are original and are in good condition. Building interior is insulated with fiberglass, and is heated with a 230 volt, 1500W electric heater. This building is sound and has no problems.

- Steelhead Building (08075) was constructed in 1999 and consists of original wood framed walls and roof on a slab on grade foundation. This building houses the polyurethane coated concrete ponds which are used for holding adult winter steelhead. The wood frame is covered with metal siding and a metal roof. Interior walls are painted plywood. Access is through a man-door and an overhead sliding garage door. The building is supplied with commercial power for lights and 120 volt receptacles, and with domestic water for wash-down as needed. The building is not heated. This building is sound and has no problems.

- Residences (08072, 08073 and 08074) were constructed in 1968 and consist of wood siding exterior walls on 4 ft. crawl space foundations. Wood siding is original to all. All roofs are asphalt shingles. All residences are heated with wood stoves. Maintenance recommendations and recent improvements and are as follows:

**0872 Maintenance Needed:**

- Asphalt shingle roof (circa 1988) has been subjected to frequent high wind and moss growth, and should be replaced before significant damage can occur
- Wall to wall carpet (circa 1995) is nearing the end of functional use
- Rear sliding door should be replaced as soon as possible
- Floor insulation must be installed as soon as possible

Recent Improvements:

- Windows were replaced in 1995 and are sound
- Kitchen floor tile replaced in 1999
- Garage door was replaced in 2003 and is sound
- Wood stove was replaced in 2003
- Vinyl flooring replaced in 2004
- Entire house painted in 2004
- Ceiling insulation was added in 2007
- Septic outflow pipe from the house was replaced in 2007
- Hot water heater replaced in 2008
- Garage walls and ceiling were insulated and sheet-rocked in 2008

**08073** No Urgent Maintenance Needed

Recent Improvements:

- Windows replaced in 1995
- Garage door replaced in 1999
- Wood stove replaced in 2003
- Storm doors were replaced in 2004
- Ceiling insulation installed in 2004
- Entire house painted in 2004
- Vinyl flooring replaced in 2005
- Water heater replaced in 2007
- Carpet replaced in 2007
- Asphalt shingle roof and steel gutters replaced in 2008
- Septic system serviced, then replaced in 2008

**08074** Maintenance Needed:

- Asphalt shingle roof (circa 1988) has been subjected to frequent high wind and moss growth, and should be replaced before significant damage can occur
- Floor insulation must be installed as soon as possible

Recent Improvements:

- Windows replaced in 1995
- Wall to wall carpet installed in 1996, still good

- Vinyl floors replaced in 1999
- Wood stove replaced in 2000
- Garage door and opener replaced in 2003
- Sliding glass patio door replaced in 2004
- Entire house painted in 2004
- Storm doors replaced in 2005
- Septic tank serviced in 2005
- Hot water heater replaced in 2007
- Vapor barrier and borate treatment in 2009
- Aluminum gutters replaced in 2009

## **Life Safety**

No issues to report.

## **ADA**

Two locations on the site have accessible parking. Primary visitor parking is on the south side of the Hatchery Building (08031), and is ADA compliant; however, access to the office and hatchery building is not fully ADA compliant. The main entrance to the building is not accessible and the access ramp on the west side of the building is too steep and needs to be repaired and lengthened by 2' to comply. While this building is open to the public, and the alternate entrance is accessible, no sign exists to direct visitors to the alternate accessible entrance.

Secondary parking on the west end of the facility is for access to the spawning shed. The visitor parking area is not marked with striping or designated with a sign. The only sign that points the public to this parking area is a sign attached to the stop sign reading "Disabled Drivers Only".

Two interior spaces within the Hatchery Building (08031) are open to the public: the lobby and the restrooms. The lobby is an ADA compliant space, with access from the alternate entrance. The restrooms, accessed from the lobby, are not ADA compliant. Insufficient space prevents a wheelchair turn-around. In order to expand the restrooms a portion of the building, including the entrance, would have to be rebuilt. An ADA compliant sani-can has been installed outside the building as an alternative. While not considered a permanent solution, no plans to reconstruct an accessible restroom have been made. A possible solution would be to combine the men's and women's restroom into one larger unisex restroom. Currently, no signage inside the building directs the public to the sani-can outside.

#### **2.4.6 North Nehalem River Hatchery**

The North Nehalem Hatchery was established in 1966. This hatchery is noted for the accessible public fishing platform, accessible restroom, and ample accessible parking. The hatchery takes water by pump from the North Nehalem River.

According to staff, the condition of the rearing ponds is poor. There is evidence of settling and cracking in several of the ponds.

North Nehalem has one intake, which is located on the North Nehalem River. It was installed in 1966 the same year the hatchery was established. It is a pumped intake, and to support this, there is an emergency back-up generator for the pumps in case of power failure. The intake has been described as being in good condition.

##### **Buildings**

The following buildings were assessed as part of the maintenance master plan: Residence #1 (04056), Pole Building (not shown on site map) (04060), Service Building (04070), Shop/Storage Building (04072), and Restroom Building (04088).

There are four residences (04056, 04057, 04058, and 04059) all built by the same plan; they are in very good condition and many have been remodeled in the last five to ten years. All exhibit proof of frequent maintenance. According to staff, the septic fields are functioning properly.

The hatchery buildings are also in good shape (04060, 04070, 04072, 04088). The oldest buildings were built in 1966, when the hatchery was established. New buildings were added in the 1990's and 2001 (when the public accessible fishing area was constructed).

Generally, the roofs for all the buildings have been well maintained, however, some of the roofs have reached the end of their typical life expectancy and will need to be replaced soon. Although the staff reported few roof leaks, there are large amounts of moss building up on some roofs. The moss needs be removed as a maintenance item.

##### **Systems**

The Service Building (04070) contains unit heaters which appear to be functioning properly. The Pole Building (04060) and the Shop/Storage Building only have electricity (i.e. no heat or plumbing).

Since this is a pumped hatchery, there is a large emergency generator with associated electrical switchgear, panels and wiring. The generator was moved to the site from another location.

The switch gear and generator are nearing the end of the expected life of these units. Upgrading to VFD motor controls will reduce the facility electrical consumption, and will likely pay for the initial investment with the consumption savings.

The emergency generator is WWII vintage and was surplus from a naval ship. This vital system should be replaced with a newer dependable unit.

### **Life Safety**

There are no life safety issues to report at this site.

### **ADA**

North Nehalem Hatchery features an ADA accessible fishing platform. To support this accessible platform, there are 17 accessible parking spaces and an accessible restroom. There are two ramps from the parking area. One ramp leads to the public restroom, the other leads to the fishing platform. Both are ADA compliant with regard to slope, surface, landings and handrails. The rough condition of the asphalt paving constitutes a barrier to travel around the site and restricts visitor access to rearing ponds. Since the paved vehicular surfaces also serve as pedestrian circulation, these areas should be resurfaced to comply with ADA requirements.

The Restroom Building (04088), adjacent to the parking area for the accessible fishing platform, was built in 2001 and meets ADA accessibility criteria. It is intended to serve as a public restroom for the entire site.

## **2.4.7 Rock Creek Hatchery**

Rock Creek Hatchery obtains its water supply from the North Umpqua River and Rock Creek. The water obtained from the Umpqua River is pumped to the site during the summer months, and water from Rock Creek is delivered year round through a gravity system. The intakes, North Umpqua pump station installed in 1978 and the Rock Creek gravity reconstructed in 1998, are concrete and are of sound integrity. The floor of the intake channel is wearing down, but is scheduled to be repaired in 2010. The upkeep of the intake channel is a priority and needs to be repaired approximately every 8-10 years. The current means of cleaning the intake screens is using the natural velocity of the water. A more efficient method would be to install a mechanical spray similar to those used at other hatcheries.

A small portion of vehicular asphalt on the site is cracked along the surface and requires a new seal coat. There is an asphalt path leading to a deck open to the public, which looks over the river. The asphalt is cracked substantially along the entire path and needs to be replaced. All 52 of the small valves serving the older raceways are damaged and need to be replaced. The valve threads are damaged and difficult to turn, the valve stems are rusted and leaking, and some of the valves don't turn at all. The six valves that are larger than 18" are: a 36" weir wheel valve (which needs replacing), a 36" supply line valve, a 20" blowout valve, a 40" butterfly valve and two 30" intake valves. Most of the rearing ponds/raceways are in good condition. One raceway (concrete) that was built in the 1940's is cracking and chipping along the walls and floor. The aggregate is exposed due to the concrete wearing down. This makes cleaning the concrete considerably more difficult due to fish food and other particles of dirt getting caught in the aggregate. The concrete needs to be repaired/replaced where this is occurring.

## **Buildings**

The following buildings were assessed as part of the maintenance master plan:

Residence (10091), Residence (10092), Residence (10093), Residence (10094), Residence (10095), Generator Building (10122), Garage Building (10126), Pumphouse (10130), and Hatchery Building (10140).

Residence (10091), built in 1957, consists of wood siding exterior walls on a slab on grade foundation. The siding is original to the building and is in good condition. The roof, replaced in 1995, was installed on top of sheathing that will need to be replaced soon. The storm doors were replaced in 2000. The house is heated via a heat pump and circulated through ductwork. The heat pump was installed in 1989 and is in good condition. The ductwork, original to the house, may need new tape at the joints.

The interior space of Residence (10091) is in good condition with no problems to report. The carpeting and vinyl flooring were replaced in 1995. The rest of the interior finishes are original.

Residence (10092), built in 1938, consists of concrete fiber siding walls on an 8 ft. foundation (basement). The siding was replaced in 2009.

The roof, replaced in 1992, is asphalt shingles and is in good condition. The gutters were replaced at the same time as the roof. The storm doors were replaced in 1992, and a porch was added to the house in 2000. The treads are coming apart from the risers. The concrete path leading to the house is cracked and needs to be repaired. The house is heated via a heat pump that was installed in 1989 and is in good condition.

The interior space of Residence (10093) is in good condition with no problems to report. The carpeting was replaced in 2000 and has been maintained well. The vinyl flooring was replaced in 1985. The rest of the interior finishes are original to the building.

Residence (10094), built in 1948, consists of wood siding walls on a 4 ft. crawl space foundation. The walls are original to the building and are in good condition. The roof, replaced in 1992, is asphalt shingles and is in good condition. The gutters were replaced the same time as the roof. The storm doors were replaced in 1990. The exterior of the building overall is in good condition with new concrete fiber siding installed in 2007. The house is heated via a heat pump and circulated through ductwork. The heat pump was installed in 1989 and is in good condition. The house also has a wood stove that produces more than enough heat to keep the house comfortable in the winter.

The interior space of Residence (10094) has a couple of issues, but overall is in good condition. A portion of the sheetrock in the house is cracking, mostly in the front bedroom. The cracks are located at the corners of the walls, and near the corners of windows. The carpeting, replaced in 2007 is in good condition. The bathroom was



remodeled in 1998 and had wall finishes and toilet accessories replaced. The lighting was replaced in 1995.

Residence (10095), built in 1962, consists of concrete fiber sided exterior walls on a slab on grade foundation. The siding was replaced in 2004 and is in good condition. The asphalt shingle roof was replaced in 1991 and is also in good condition. The only problem with moisture infiltration is at an exhaust vent that protrudes through the roof. The opening needs to be repaired to prevent further water infiltration. The house is heated via a heat pump and circulated through ductwork. Half of the power wiring was replaced in 1991; the other half is original to the building.

The interior space of Residence (10095) has a couple of problems, but overall is in good condition. The kitchen was remodeled in 2010 with new cabinetry, floors, and countertops. The bathroom was completely renovated in 1999, including bathroom fixtures and accessories. The carpet was replaced in 1993 and has been maintained well. The wood paneling was replaced in 2001. The lighting was replaced in 1992. The rest of the interior finishes are original to the building.

The Generator Building (10122), built in 1978, consists of CMU exterior walls on a slab on grade foundation. The roof, replaced in 1995, is asphalt shingles and is in good condition. The gutters were replaced the same time as the roof. A portion of the interior is supplied heat via electric radiation, which was installed in 1998. The building overall is in good condition. The interiors are all in good condition. The interior finishes were all replaced during a remodeling in 1998. The CMU blocks have minor cracks along the surface on the interior.

The Garage Building (10126), built in 1937, consists of wood siding on a slab on grade foundation. The exterior walls are in good condition. The asphalt shingle roof and gutters, replaced in 1991, are in good condition as well. The building is not supplied with heat nor is it insulated. The interior is completely unfinished with no problems to report.

The Domestic Pumphouse (10130), built in 1991, consists of wood panel walls on a slab on grade foundation. The exterior walls are in good condition. The roof is original to the building and is also in good condition. There is heat supplied to the building. The interior space is completely unfinished with no problems to report.

The Hatchery Building (10140), built in 1948, consists of wood and CMU exterior walls on a slab on grade foundation. The wood siding was replaced with concrete fiber siding and new vinyl windows installed through out. The metal roof, replaced in 1980, is in good condition with no signs of moisture infiltration. The only other part of the exterior that has been replaced since 1948 is the rollup vehicular door, which was installed in 1999. Overall, the building is in fair condition. The building is heated via a boiler and radiators. The boiler was installed in 1956 is in good condition.

The interiors of the Hatchery Building (10140) are mostly original and are in need of some repair. The interior walls of the shop space are sheetrock and need a new coat of paint. The exposed concrete slab ceiling in the shop also needs to be repainted.

The hardware of an interior door in the shop needs to be replaced. In the office the wood floors need to be refinished and repainted. The hardware of the interior doors also needs to be replaced. The walls in the incubator room (metal and concrete) need to be repainted, as well as the exposed concrete ceiling. The interior doors need to be repainted as well. The unfinished concrete walls in the electrical room need to be repainted. The corridor walls and ceiling need to be repainted.

## **Life Safety**

There are no life safety issues to report at this site.

## **ADA**

Parking spots designated as handicap accessible are located adjacent to the pollution abatement pond. The parking surface is gravel and the unloading zone is not marked. In order to make the parking ADA compliant an asphalt pad with markings needs to be installed adjacent to the handicap accessible parking spots for an unloading area. A path leading from the parking area to the main access road needs to be installed as well. The main access road serves as an ADA compliant path leading to each of the rearing ponds, the holding pond adjacent to the Hatchery Building (10140), the fish ladder, and to the entrance of the path to the observation deck over the river. A portion of the main access road is at a slope of 1:14 for a stretch of 30', making the path inaccessible. A ramp needs to be installed at this location or the asphalt needs to be re-graded to a 1:20 slope.

The holding pond provides an opportunity for the public to view and feed fish. Most of the perimeter is an ADA compliant path, however a 40' long portion of the path is loose earth and needs to be paved with asphalt.

The concrete pond adjacent to the Hatchery Building (10140) is currently not handicap accessible. There is a change in elevation of 36" and the only means of accessing the pond is one set of steps. A ramp needs to be installed, and plans have already been made to begin this project.

The only building on the site that is open to the public is the Generator Building (10122). A wood plank, most likely used to stop erosion, impedes the path to the entrance. The surface needs to be smoothed out to make the path ADA compliant. The entrance doors widths are more than 32" and there is more than 18" of clear space on the pull side. The threshold height is less than 1/4 "and the door closing force is less than 8". The only problem with the entrance is the door has a knob, which is unable to be operated with a closed fist. The knob needs to be replaced with a handle.

The bathrooms are the only interior spaces open to the public within the Generator Building (10122). There are a few problems with the ADA compliance of these spaces. The wheel chair turn around is only 42" diameter, as opposed to the required 60". An electric radiation unit is slightly protruding into the path. The toilet stall is only 42" wide, as opposed to the required 60". The handle on the door is not operable with a closed fist and needs to be replaced. There is only 27" clear

below the lavatory rim, as opposed to the required 29". There is one drinking fountain, without controls at the front, and is unable to be detected with a cane. An additional fountain needs to be installed at 36".

#### **2.4.8 Salmon River Hatchery**

Not all deferred maintenance is required to operate facility, such as a new storage building.

The Salmon River Hatchery was established in 1975. It is a relatively small and compact facility. Its proximity to Highway 18 and easy fishing access make it a popular visitor destination.

In addition to the paving which needs to be replaced, the site drains poorly; a positive drainage system should be installed. There are recirculating pumps at the two larger rearing ponds. These are in good condition.

Salmon River has one intake that is original to the hatchery. It is a pumped intake utilizing four pumps. The manager believes that the intake is poorly designed because an unnecessary amount of small and large debris is directed into the intake. The intake uses a traveling water screen to filter smaller debris (e.g. leaves) from the intake water.

Electric service is provided to individual buildings by the switchgear in the Utility Building (21163). Utility company distribution terminates at a transformer adjacent to the utility building.

#### **Accomplishments:**

The hatchery has experienced many improvements which go towards bringing this facility up to current standards. Some of these were paid for through the deferred maintenance plan monies, Go-Oregon stimulus money, department funding paid for through Engineering, housing dollars, and R & E Grants.

**Deferred Maintenance:** The Hatchery Building (21210) had its roof replaced. The original roof was of cedar shingle construction. It was replaced with 50 year shingles which are rated for winds of 110 mph and are resistant to algae and moss. Vents were added along with new gutters and downspouts. Residence (21209) received new hardy plank siding. House #21215 electrical panel was replaced; House #21209 received new carpets. House #21208 had a new bath tub module, and curved shower rod. House #21208 received a new wood burning stove, stove pipe, and cap, and houses #21208 and 21209 received built-in dishwashers.

**Go-Oregon:** House #21216 was the big project completed with these funds. The Statler mobile home was removed due to its state of disrepair and replaced with a

2009 Fleetwood manufactured home. Houses #21208 and 21209 received heat pumps.

**Engineering:** The walkways on ponds 1 & 2 were deemed unsafe by Oregon OSHA and were therefore replaced. Intake screens were not up to the NOAA criteria and new ones were engineered, constructed, and installed to meet criteria. The hatchery intake pump #2 was rebuilt with a shaft oiling system to replace water lubrication. Pump #3 was rebuilt, including a new bowl, a stainless steel impeller and new electric motor. Pump #4 was rebuilt; pump #5 was rebuilt with a shaft oiling system, new bowl, stainless steel impeller and new electric motor. Pump#6 was completely replaced and a shaft oiling system installed.

**Housing Dollars:** House #21209 carpets, windows, chimney, and water heater were replaced. Currently this house is having its kitchen remodeled with new cabinets, linoleum and some minor electrical work completed.

**R & E Grants:** We have been successful in obtaining funds from the R & E Board to get needed items or projects completed.

We have received a hydraulic trash pump and power unit for the purpose of cleaning the intake structure, money for designing a new adult collection pond/holding area, predator prevention nets over all rearing ponds and lake, and funds for a new Magic Valley 8" fish pump.

**Buildings:**

The following buildings were assessed as part of the maintenance master plan:

Utility Building (21163), Residence #1(21208), Residence #2 (21209), Hatchery Building (21210), Mobile Home "Camelot" (21215) and Mobile Home "Statler" (21216). The "Statler" mobile home has since been replaced with a 2009 Fleetwood manufactured home.

Residence #1 and #2 (21208 and 21209) are in good condition. All show proof of frequent maintenance, although there are some items (kitchen cabinets and other) that are due to be replaced. Residences (21208, 21209, and 21216) are heated with a combination of heat pumps and woodstoves. House #21209 is in need of some foundation work. The foundation has sunk down in one corner of the house and needs shoring. House #21208 should have its foundation raised by 1.5' to prevent water from entering the house as happened in the 1999 flood. Vacant resident (21215) Camelot mobile home needs to be demolished and replaced with an on site pole-type structure. This could be a 60' X 24' X 14' structure for the storage of equipment; there is a shortage of space to store equipment such as fish pumps, tractors, etc.

The Hatchery Building (21210) is a sprawling facility housing offices, an apartment for a seasonal worker, incubation and spawning areas, visitors' areas, research rooms, shops, storage and freezers. This building is in good condition; the primary requirements are to have the exterior painted and windows, lighting, and office updated. There is also a need to cut and excavate a trench the full length of the shop

doors with sump pumps at each end to pump water out of the shop to prevent flood waters from entering and damaging equipment and structures.

There was an off-site Pole Barn (21178-Demo) that was acquired in a land swap between ODFW and a nearby resident. The swap was intended to provide additional fishing access to the river, not additional land for the hatchery. The manager declared this building hazardous and an unattractive nuisance and it was demolished in 2009.

#### **Other Infrastructure:**

Other infrastructure needs have been identified by the manager.

1. The domestic water line needs to be replaced.
2. Water delivery system that supplies water to rearing lakes, ponds, and incubation, should be inspected.
3. Storm drainage system needs to be installed due to inadequate drainage.
4. Asphalt rearing ponds (21151) need to be resealed.
5. Asphalt surfaces need repaved.
6. Ponds 1 through 10 butterfly valves need replaced.
7. PVC intake manifolds on ponds 1 & 2 need to be replaced with aluminum.
8. Earthen abatement ponds need to be excavated.
9. Weir on Salmon River needs replaced and modified for more efficient fish passage and flow directed into hatchery intake structure.
10. Update the adult collection/holding/sorting pond areas and make area not only to hold broodstock, but in the off season a place where trout can be reared which would be in line with the 25 year plan for increased production of these species.
11. Heighten rearing ponds to prevent fish movement during high water events.
12. Replace or regalanize grip strut.
13. Install chain link around intake structure and rail around fish ladder.
14. Install new dam boards at hatchery intake structure, fish ladder, and ponds, preferably made of aluminum.

These items listed are going to need to be addressed at some point in the future to bring this facility up to 21<sup>st</sup> century standards. Along with these recommendations, an attempt should be made to study the feasibility of some kind of water filtration/disinfection system due to increased scrutiny of drugs and chemicals used in the culture of our salmonids.

#### **Life Safety:**

No life safety issues were reported

#### **ADA:**

The rough asphalt-paved vehicular surfaces do not provide accessible paths throughout the site. Because the paved vehicular surfaces of the hatchery also serve as pedestrian circulation around the site (i.e. to the ponds), these surfaces are the first component of the accessibility path for a visitor. There are sufficient ADA-compliant parking spaces provided.

There is a sloped sidewalk that provides access to the service building from the parking lot. The sidewalk has a slope of less than 1:20 so it is not considered to be a ramp and is not required to conform to the requirements of a ramp (handrails,

landings). There is however an irregular and excessively high vertical transition between the sloped sidewalk from the parking lot and the flat sidewalk that leads to the visitor's center. This transition averages 1 ½ inches and must be mitigated if the parking lot to visitors' center path is to be compliant.

The only building open to the public is the Hatchery Building (21210). The door at the entry to the visitor center requires approximately 12 pounds to open. This is excessive; the problem appears to be a combination of how the door fits in the frame and the operation of the closer.

Two interiors in the Hatchery Building (21210) are open to the public. The interior of the visitor center has widows that allow visitors to view activities in both the incubation room and the spawning area. In addition, one restroom has been remodeled to be ADA compliant.

#### **2.4.9 Trask River Hatchery**

The Trask Hatchery was originally established in 1916 and the site consists of two levels separated by approximately 300 yards of an asphalt/gravel road. For the most part, the main hatchery buildings and residences are located on the lower level at the site entry, and the intake, spawning shed, freezer and ponds are located at the upper level. Trask Hatchery has three gravity intakes originally constructed in 1927. Two are located on Gold Creek and the other is located on Mary's Creek. With the exception of the valves that need to be replaced, the intakes are functioning properly.

One significant problem is the deterioration of the asphalt paving. Although the asphalt has been patched and repaired in the past, it appears to have reached the end of its useful life and needs to be resurfaced. The asphalt paving only extends 1/3 of the way into the upper site. Since the entire site is open to the public, the asphalt paving needs to be extended throughout the entire facility to provide an accessible surface.

The water lines are in fair condition and numerous valves are reported to be leaking and beyond repair. The condition of the concrete ponds is described as good. The earth settling pond is in poor condition and needs to be replaced or at least lined with a membrane.

##### **Buildings:**

Residences that were inspected include Residence (29283), Residence (29284), Hatchery Building (29290), Storage Building (29306), Freezer Building (29324) and Spawning Shed (29330).

Residence (29283) and Residence #3 (29284) are in generally good condition. Both show proof of frequent maintenance. The garage to Residence #2 (29283) is in very poor condition and most likely beyond repair.

The Hatchery Building is also in good shape. It functions as a shop/office/staff room and incubation room. For the most part, the only issues that need to be addressed are the replacement of finishes and the replacement of a non-functional unit heater. Recent additions to the facility include a Freezer Building (29324) and a Spawning Shed (29330) that date from the mid 1980's. The Freezer Building (29324) is a relatively new building and is in excellent condition. The Spawning Shed (29330) is open to a holding pond on one side. The building is in fair condition.

Most of the roofs have either been recently installed or maintained properly and are in good condition. There are large moss accumulations on most of the roofs. The moss needs to be removed as a routine maintenance task.

For all buildings, the heating systems are properly functioning unit heaters.

**Life Safety:**

No life safety issues were reported.

**ADA:**

The site has a single information kiosk and a portable toilet that are open to the public. In addition, the paved and graveled portions of the site around the rearing and holding ponds are considered open to the public. Neither the gravel nor asphalt paved surfaces are ADA compliant, and all surfaces need to be replaced.

There are no compliant ADA parking or van parking spaces.

In addition to the portable toilet, the Hatchery Building (29290) is also considered public. The threshold height at the entry is too high, and the office and restroom are two risers above the main hatchery floor level. Ramps will be required to make these paths accessible. In addition, the restroom is not compliant and if the intent is to use the portable toilet as an accessible restroom, appropriate signage must be provided.

## **2.5 Recommendations**

### **2.5.1 Alsea Hatchery Recommendations**

#### **2.5.1.1 Water**

Warm summer water can be problematic for the hatchery. The hatchery should continue to explore new technology that could improve water filtration, chilling, and re-use within the hatchery system. Drum lift and UV filtration should be incorporated for use during summer low flow periods.

#### **2.5.1.2 Fish Passage**

Juvenile fish passage at the upper trap / water intake site can be problematic for down stream migrants, especially for juvenile Chinook during low summer flow

periods. Design options should be explored to facilitate better juvenile down stream migration passage through the trap.

#### **2.5.1.3 Intake Screen / Protection**

Fish screening criteria by NOAA Fisheries for anadromous salmonids is for screen openings not to exceed 3/32-inch in diameter and/or diagonally. The hatchery intake screen is 1/8 inch and does not meet NOAA Fisheries criteria. The intake screen should be retrofitted to meet NOAA Fisheries criteria.

River bank erosion is occurring just upstream of the hatchery water intake and threatening an access road. Appropriate erosion control should take place to prevent damage from occurring to the water intake.

#### **2.5.1.4 Release / Recapture Location**

Many anglers have voiced concerns in recent years over the lack of a consistent winter steelhead fishery in the mid to lower section of Alsea River. It is believed that because all the steelhead smolt releases occur directly from the hatchery located in the upper part of the basin that returning adults quickly migrate up river thereby only providing a short time period for a meaningful fishery in the mid to lower river. Exploration, evaluation and development of a lower to mid river smolt acclimation and adult recapture site should continue with the intent of spreading the fishery into the mid and lower Alsea River basin.

#### **2.5.1.5 General Facilities Improvement Related Fish Management**

**Palmer Creek Acclimation / Trapping Facility:** The Palmer Creek facility has been in full operation since 1998 and is a critical component for the implementation of the Siletz Basin hatchery program for winter steelhead. Activity includes the collection of returning adult hatchery steelhead and acclimation of juvenile steelhead prior to out-migration. There are two ponds located at the Palmer Creek that are used to acclimate the 50,000 juvenile winter steelhead. Over the years the ponds and raceways have become heavily silted in and are in need of maintenance to restore the proper depth and flow of water. This work would require the use of heavy equipment to dig out both ponds and raceways and relocate the sediment.

In addition, a seasonal picket weir is used to prevent upstream migration of returning adult hatchery winter steelhead in Palmer Creek and to direct them into an adult trap. The weir site is located in a floodplain with highly erodible soil types which makes weir stabilization, function and trapping difficult during rain events. A new semi permanent weir design (such as concrete footings) is needed for more effective adult steelhead collection and to prevent hatchery fish from spawning in natural habitat.



## **2.5.2. Bandon Hatchery and Associated District Hatchery Programs Recommendations**

### **2.5.2.1 Improvement of Broodstock Collection**

Additional traps and or weirs for broodstock collection are needed in the Coquille Basin, where most broodstock are collected by in-river netting efforts. Very few swim-in fish are available for broodstock, because most releases are made at remote acclimation sites away from Bandon Hatchery. Netting efforts near our acclimation sites are suspect, due to the potential that unmarked adult fish may be the progeny of hatchery adults. Trap sites located geographically remote from acclimation/release sites are needed to obtain the annual wild component (target of 30% or greater) of our broodstock. There is a need for a better trap at Sevenmile to collect fall Chinook broodstock, including the need for a permanent easement with the private landowner. In-river traps in the South Fork and North Fork Coquille and/or tributaries would greatly improve our ability to meet broodstock collection goals for winter steelhead and fall Chinook. There is also a current and periodic need for replacement of broodstock collection equipment (e.g. dipnets, entanglement nets, pontoon boats, portable tanks, aerators). The intensive, seasonal nature of broodstock collection in multiple basins and for multiple fish species often strains our staffing level, and our ability to recruit suitable volunteers.

### **2.5.2.2 Improvement of Acclimation**

Many of our Chinook and steelhead acclimation sites are “primitive” or low-tech, which can be effective but also creates challenges. Specific needs are better screens, improvement of easements/agreement with landowners where necessary, accommodation of native fish passage needs during acclimations, and acclimation infrastructure that won’t be compromised during extreme weather events. Issues/challenges include in-channel vs. off-channel acclimation, site security, weather and water quality ranges during the acclimation period, and changing landowner attitudes. (See also Passage/Screening, below.)

For the Coquille winter steelhead HGMP, the Hantz Creek Acclimation site has been discontinued, and a replacement has not been developed. For the interim, this has caused us to make direct-stream release of the East Fork Coquille River steelhead smolts. Due to shifts in the angling effort between the East Fork and North Fork steelhead fisheries, we have shifted the 25,000/20,000smolt releases, respectively, to vice versa. In this HGMP, we identified the need for improved or additional acclimation sites and additional traps and/or adult broodstock holding ponds as “potential reforms and investments”. The acclimation of fall Chinook smolts at lower Ferry Creek (in the city of Bandon) was initiated a few years ago in attempt to develop a fishery in the Bandon harbor area, in much the same way that the Blossom Gulch acclimation has for the city of Coos Bay. This acclimation structure needs improvements in the keyway and dam boards that contain the fish for two weeks.

Temporary in-stream acclimation sites that are operated for two- to three-week acclimations do not provide upstream or downstream passage for native fish. In some cases, the acclimations are not during critical fish movement periods, and in other cases we have provided downstream outmigrant “flumes” that allow for native smolt emigration through our acclimation site. Nevertheless, there are temporary blockages

that occur with the operation of acclimation sites. There is a need at some sites to either: (a) provide passage, or (b) develop an alternative acclimation site (e.g. create an out-of-stream acclimation rather than in-stream).

#### **2.5.2.3 Passage/Screening**

There are two facility issues at Bandon Hatchery with regard to passage and screening: (a) the reservoir dams do not provide for fish passage upstream on Ferry and Geiger creeks, and (b) the screen perforations for Bandon Hatchery water intakes are 1/8" x 3/4" slots, which does not meet NOAA Fisheries criteria. Given the impassable dam situation, anadromous fish are not at risk, but cutthroat and other native fishes inhabit the basins above the dams. The screening issue is one that is much more easily addressed than the passage issue. Replacing the current screen plates with those meeting NOAA Fisheries criteria can be logistically accomplished at moderate cost. Providing passage at the two reservoir dams would be a costly construction project, and would increase the risk of disease once anadromous adult salmonids were able to ascend upstream beyond the hatchery water supply intakes.

China Creek Trap, located on BLM property in the East Fork Coquille subbasin, has been assessed for repairs necessary due to deterioration and site changes that have altered juvenile fish passage conditions when the trap is not in use. ODFW Fish Passage engineers have agreed to visit the trap and develop options for retro-fitting and repairing the structure so that passage conditions will be improved. This trap is used primarily for wild winter steelhead broodstock collection.

#### **2.5.2.4 Coho Smolt Production**

The coho smolt programs for the Coos and Coquille basins were discontinued and the only broodstock collection, spawning, and incubation that now occurs is for unfed fry releases to jumpstart unseeded habitat, especially where barriers have been recently removed, and only for one life cycle length (3 years for coho) in a given stream.. The smolt program was not discontinued for conservation reasons, but rather, due to issues with survival in the hatchery environment and low return to creel. Although we did conduct wild (unmarked) coho fisheries in 2009 in the Coos and Coquille basins, and perhaps will again in the future, the unfed fry releases do not currently have a harvest objective. In upcoming years, it is likely that we will re-evaluate the need to restore a hatchery coho smolt program in the Coos and Coquille basins for harvest augmentation. If wild coho populations flourish and wild coho fisheries continue to be viable in these systems, restoring a hatchery smolt program may not be necessary. Bandon Hatchery could accommodate the restoration of a hatchery coho smolt program, if accomplished as it was previously (i.e. rearing at Cole Rivers or Butte Falls hatcheries), and if coho production was traded-out for the increases in Chinook production that took place when the coho program was discontinued.

#### **2.5.2.5 New Liberation Truck for Bandon Hatchery**

The liberation truck (Truck #63; circa 1985) currently shared by Bandon Hatchery and Elk River. Hatchery is wearing out and is in need of replacement. Its 2,000-gallon capacity is generally adequate for liberations around the District. Scheduling problems occur, especially in the spring time, when both hatcheries have intensive need for the truck in order to liberate trout, salmon, and steelhead to waters of their respective Districts. Logistically, and perhaps budget wise, it would be better for

each hatchery to have a liberation truck so that scheduling would not be an issue, and time spent by hatchery personnel shuttling the shared truck between facilities would not be wasted.

#### **2.5.2.6 Monitoring and Evaluation**

Major changes occurred in the Coos fall Chinook hatchery program, as a result of the 2005-06 STEP Propagation Project Review. Smolt and unfed fry production was eliminated toward a program entirely based on the release of spring presmolts. The Coos Chinook program now includes an intensive Monitoring and Evaluation Plan looking at contribution to fisheries, hatchery fish on natural spawning grounds, survival, the effectiveness of different strategies (e.g. acclimation vs. on-site rearing/release) and the effectiveness of different STEP facilities. The overall mark rate for Coos hatchery fall Chinook releases increased from 7-8% to over 30% with the new M&E Plan. The new Morgan Creek STEP facility was built in 2007, and began functioning that fall, including many improvements to fish cultural operations, reduced impacts to Morgan Creek, and reduced impacts to native fish. There is a need for long-term funding of monitoring and evaluation of hatchery programs. As Conservation Plans are developed, we anticipate a greater need to evaluate our hatchery programs in order to continue them under the NFCP. There is a need for greater monitoring to meet NFCP Interim Criteria (especially Hatchery Independence) pending the development of Conservation Plans. This especially applies to our steelhead programs, where ratios of hatchery fish on spawning grounds are not available. Funding for monitoring is currently grant-driven (e.g. R&E, SFR, PST) and “transient”, necessitating frequent re-application to entities that are reluctant to fund long-term projects.

It is anticipated that mark-selective fisheries will be more of the trend rather than exceptions as we move into the future. Also, marking to accommodate monitoring and evaluation will increase the need for facilities and funding. A dedicated marking trailer for the Coos-Coquille-Tenmile Fish District, housed at Bandon Hatchery would help us accomplish the marking requirements. Automated marking technology could accomplish this without the need for multiple additional staff. Temporary in-stream acclimation sites that are operated for two- to three-week acclimations do not provide upstream or downstream passage for native fish. In some cases, the acclimations are not during critical fish movement periods, and in other cases we have provided downstream outmigrant “flumes” that allow for native smolt emigration through our acclimation site. Nevertheless, there are temporary blockages that occur with the operation of acclimation sites.

The Bandon Hatchery operations plan and Coquille Chinook HGMP describes our “payback” program which exists primarily at the request of local STEP volunteers and anglers. The unfed fry release of up to 100,000 fry split between North and South forks was initiated about ten years ago due to the complaint that broodstock for the hatchery smolt program are collected from upriver-bound adult Chinook, while the smolt releases are made in lower tidewater where the primary fishery occurs. This release is presently occurring without evaluation.

An evaluation should be conducted to determine the justification (or lack thereof) of separating the Stock 44 and Stock 144 Coquille winter steelhead broodstocks. The initiation of this separation took place in the 1990’s, primarily due to perceived

differences between fish returning to the South Fork Coquille vs. the North and East forks. The geology of the subbasins is different, with the South Fork being a hard-rock, volcanic formation, while the remainder of the basin was formed of uplifted, seafloor basalts overlain by thick deposits of sedimentary sandstone. Genetic samples were taken in the late 1990's, but results were never received to justify the separation or return to a single Coquille broodstock.

This may be an evaluation that the Oregon Hatchery Research Center could help us design and conduct. Bandon Hatchery is able to continue with separate broodstocks without difficulty, but if that separation is not justified, the management of a single Coquille winter steelhead broodstock would simplify adult collection, holding, spawning, egg incubation, and rearing. The program would also likely benefit from increased numbers of family groups.

#### **2.5.2.7 Chinook Spawning Channels**

The establishment of spawning channels is a concept that we've discussed that may benefit Chinook and chum salmon in the Coos system (considered to be gravel limited due to historic splash-damming). This approach has been implemented elsewhere in the Pacific Northwest, particularly in Washington and British Columbia. Our investigation of this concept has not gone very far as yet.

#### **2.5.2.8 Consolidated Needs & Recommendations List:**

- Extend underground vacuum lines for pond cleaning.
- Acquisition of large (6"), trailer-mounted water pump for pathogen treatment/abatement.
- Improve condition of the rearing ponds (cracks, pond bottoms).
- Concrete sidewalk cracks adjacent to Residence #1.
- Residence 1's interior repairs (upstairs ceiling paint peeling, kitchen casework doors and drawers do not close properly and wood is deteriorating,, water heater replaced.)
- Residence 4's windows need to have the weather stripping replaced.
- Residence 4's cabinets are beginning to warp around the sink.
- Residence 2 demolition.
- After Res. 2 is demolished, a laundry facility needs to be installed.
- Cold storage bldg.—two doors need replaced, doorknobs and locks installed
- Ferry Creek Spillway—inadequate size; needs to be engineered and expanded.
- Permanent restrooms for public use.
- ADA pathways at ponds and restrooms.
- Additional traps/weirs for broodstock collection in the Coquille Basin.

- Improve trap at Sevenmile including easement with landowner.
- Periodic replacement of broodstock collection equipment.
- Acclimation sites—
  - better screens,
  - easements/agreements with landowners,
  - fish passage during acclimations,
  - infrastructure to withstand extreme weather/water flow ranges.
- Improve keyway and damboards at lower Ferry Creek acclimation.
- China Creek Trap—juvenile fish passage, repair deterioration;
- Long-term funding for monitoring and evaluation of hatchery programs.
- Dedicated marking trailer for the Coos-Coquille-Tenmile Fish District.
- Evaluate justification of separate Stock 44 & 144 StW broodstocks.
- Funding for STEP fish food.
- STEP facility fish cultural and water quality equipment.

### **2.5.3 Butte Falls Hatchery Recommendations**

#### **2.5.3.1 Water**

Butte Falls Hatchery uses surface water from the South Fork Big Butte Creek. A low level of anadromous fish production has been documented in the creek above the falls at Butte Falls. While the risk of disease is not above that at any other surface water facility, and may be lower due to the falls, a water supply devoid of anadromous fish would reduce risk. No such option is known at this time.

#### **2.5.3.2 Broodstock Collection**

Production of anadromous fish at Butte Falls Hatchery has been focused on providing assistance to programs outside the Rogue watershed, primarily the Coquille and Umpqua. Broodstock collection recommendations can be found for the entries for each program in this document.

Trout production is the backbone of recreational fishing in Oregon and fish production at Butte Falls Hatchery. Preference surveys have documented the importance of hatchery rainbow trout for Oregon anglers. Decreases in trout production can have profound impacts for fish managers.

Broodstock collection in relation to trout fisheries is more correctly stated as stock management. Additional assistance is needed to help managers decide on issues surrounding the use of diploid versus triploid trout, and whether the use of other stocks can improve fishery contribution or address particular fishery management challenges.

### **2.5.3.3 Monitoring and Evaluation**

Production of anadromous fish at Butte Falls Hatchery in recent years has been focused on providing assistance to programs outside the Rogue watershed, primarily the Coquille and Umpqua. Monitoring and evaluation recommendations can be found for the entries for each program in this document.

Trout production is the backbone of recreational fishing in Oregon and fish production at Butte Falls Hatchery. Preference surveys have documented the importance of hatchery rainbow trout for Oregon anglers. Decreases in trout production can have profound impacts for fish managers.

A creel report and angler preference survey conducted at Howard Prairie Reservoir will provide additional detail about the fishery as well as the fishery contribution of the different release strategies. It is important to note that the draft creel survey reports 34,500 angler trips to Howard Prairie Reservoir in 2009. This level of effort is near the post-treatment levels reported at the highly publicized Diamond Lake fishery in 2008 and 2009 (roughly 40-50K angler trips).

Regular funding of creel surveys at stocked waterbodies would evaluate the contribution of trout programs to the fishery, and would facilitate adjustment of trout allocations when/where needed. Funding for more thorough studies aimed at evaluating fish management at individual waterbodies would allow a quicker response and help identify creative solutions to problems.

### **2.5.3.4 Production**

Butte Falls Hatchery is ready to resume full production in 2010 after an outbreak of infectious hematopoietic necrosis virus (IHNV) occurred at the hatchery in 2006. Program changes will mean somewhat different numbers and stocks of fish for future production at the hatchery.

#### **2.5.3.4.1 Coho - Umpqua Stock 18**

The Coquille Stock 44 coho program was eliminated in favor of additional production of fall chinook for the Coquille basin. Umpqua Coho stocks 18 and 55 were described in the 2003 HGMP as being incubated at Butte Falls for early rearing, with presmolts being shipped back to Rock Creek Hatchery. While production of stock 55 has been discontinued, production of stock 18 continues (60,000 smolts). These fish could be reared at Butte Falls Hatchery.

#### **2.5.3.4.2 Fall Chinook—Coquille Stock 44**

The current program is 154,600 smolts released at Sevenmile Creek (80k), Cunningham Creek (Coquille H. S. Science class—10K); lower Ferry Creek holding pen (10k); and the proposed Hall Creek acclimation site (up to 54.6k). At least 25% will be finmarked prior to release, and a portion of those will be marked ad-CWT.

This program supports a highly successful and popular fall chinook fishery in the Coquille River. Creel surveys indicate a significant contribution to the fishery by these hatchery fish and a healthy naturally produced population. As stated in 2006, elimination of this program at Butte Falls Hatchery would reduce the fish available

to the ocean sport/commercial fisheries and the in-river sport fishery. The relatively healthy natural run would still be able to support a reduced fishery. Sufficient bloodstock exists to re-establish a hatchery program if the existing bloodstock is lost. All broodstock are collected by capturing adult fish at locations around the Coquille Basin. No smolts are released at Bandon Hatchery therefore few swim-in adults are available for brood.

The 2008 HGMP lists Cole Rivers Hatchery as the production facility, but these fish could be reared at Butte Falls Hatchery. Reform/investments listed in the HGMP include infrastructure improvements and mass marking.

#### **2.5.3.4.3 Winter Steelhead—Umpqua Stock 18**

The 2006 HGMP proposes to rear fish at Butte Falls instead of Rock Creek beginning in 2005, at least partly to reduce straying back to Rock Creek. Current plans call for the shipment of 80,000 eyed eggs from Rock Creek to Cole Rivers Hatchery to make 65,000 fingerling at 50/lb, to be shipped back to Rock Creek for their second year of rearing. This production could be reared at Butte Falls Hatchery.

#### **2.5.3.4.4 Summer Steelhead—Umpqua Stock 55**

For Umpqua summer steelhead, the current production schedule calls for the shipment of 75,000 eyed eggs from Rock Creek to Cole Rivers Hatchery to make 65,000 fingerling at 50/lb, to be shipped back to Rock Creek for their second year of rearing. This production could be reared at Butte Falls Hatchery.

#### **2.5.3.4.5 Rainbow Trout—Oak Springs Hatchery Stock 53**

The historic program for Oak Springs Rainbow Trout is 402,500 fingerlings annually. Fish were received from Klamath Hatchery in February and reared through May, and released as 75-per-pound fingerling primarily into Howard Prairie Reservoir (along with Galesville Reservoir in the Umpqua watershed). Klamath Hatchery has historically produces 250,000 fingerling destined for Hyatt Lake.

Both Hyatt and Howard Prairie are very productive reservoirs that have been managed as quality trout fisheries over time. The spring fingerling grew quickly and began contributing to the sport fishery by the fall of the same year. Both lakes have provided significant fisheries that have added to the diversity of angling opportunity for Southwest Oregon anglers.

An illegally introduced population of smallmouth bass at Howard Prairie expanded dramatically in the early 2000s, and the trout fishery declined not long after the expansion. A pilot project funded by ODFW's Restoration and Enhancement Program (with help from the Rogue Flyfishers) tested the release of larger fingerling in the fall as way to restore the trout fishery while still taking advantage of the productive capabilities of the reservoir. For two years, spring fingerling, fall fingerling, and legal-sized trout were released at Howard Prairie with differential finclips. Data from a creel survey conducted in 2009 are still being reviewed, but it appears that the survival of spring fingerling is low, likely due to predation by the bass.

At this time production calls for the release of fall fingerling at Howard Prairie. Fish released at six to seven inches in length (eight fish per pound) in late September/early October appear to reach eight to ten inches in length by opening day of the following year. The production schedule lists a 100,000 fish release, but district staff estimates that a minimum of 150,000 are needed for the fishery. The district is attempting to fund the additional 50k through supplemental trout purchases under the 25 Year Recreational Angling Enhancement Plan. Plans call for the use of triploid trout when the fishery is stabilized at Howard Prairie.

The fish for Howard Prairie are currently being produced at Cole Rivers Hatchery. Hatchery staff report that an additional 50K fall fingerling could be produced, but no more due to pond space limitations. Cole Rivers has successfully met production, but the perception among many anglers is that copepods on trout “began appearing” at Howard Prairie only after production switched from Butte Falls to Cole Rivers Hatchery. Copepods are common in rainbow trout in Lost Creek Reservoir upstream from the hatchery.

The final creel report and the results of an angler preference survey will provide additional detail about the fishery at Howard Prairie Reservoir, as well as the fishery contribution of the different release strategies. It is important to note that the draft creel survey reports 34,500 angler trips to Howard Prairie Reservoir in 2009. This level of effort is near the post-treatment levels reported at the highly publicized Diamond Lake fishery in 2008 and 2009 (roughly 40-50K angler trips).

It is easy to overlook the importance of sport fisheries for rainbow trout in the face of advocacy for anadromous and warmwater fisheries. The 2006 Oregon Angler Preference Survey reported that anglers who fished in Oregon over the previous 12 months fished primarily for rainbow trout (73%) compared to salmon in freshwater (33%), steelhead (30%), and warmwater fish (26%). Preliminary results from Howard Prairie show that anglers most often target trout (78%) at the reservoir.

This stock consistently provides for a significant angling opportunity that would be drastically reduced if this program were eliminated.

#### **2.5.3.4.6 Rainbow Trout—Cape Cod Hatchery Stock 72**

Production of Roaring River stock rainbow is the primary duty at Butte Falls Hatchery. Under full production, most of the legals produced by Butte Falls Hatchery are stocked in the Tenmile Coos Coquille District (60,615). The next highest production is 55K trout at 12 fish per pound for Rock Creek Hatchery. Some additional legals are produced for the Rogue and South Coast districts, and some trophy trout are produced. The hatchery fishing pond has developed into a very popular fishery for the Butte Falls community.

As stated for the previous stock, trout production is the backbone of recreational fishing in Oregon. Preference surveys have documented the importance of hatchery rainbow trout for Oregon anglers. Decreases in trout production can have profound impacts for fish managers.



## **2.5.4 Cedar Creek Hatchery Recommendations**

### **2.5.4.1 General Facilities Improvement Related Fish Management in the Basin**

**Three Rivers Weir and Trap:** Three Rivers contains naturally-produced OCN Coho (ESA Threatened), fall Chinook, spring Chinook, winter steelhead, and coastal cutthroat trout. A concrete apron and stem wall with hydraulically operated picketed panels completely spans Three Rivers and allows ODFW to prevent upstream passage of hatchery-origin fish during most flow conditions. However, at high flows, the barrier is ineffective at blocking passage which results in passage of hatchery fish to upstream spawning areas. ODFW attempts to allow volitional passage of wild fish during a period in the fall by lowering the picketed panels, but this method of operation has been ineffective at most flow levels. In addition, the existing trap and ladder are not operable at high flows, and at low flow fish (hatchery and wild) tend to congregate in a pool directly below the barrier and not enter the ladder and trap. In aggregate, the design of the existing weir, trap, and ladder does not allow for efficient collection and removal of hatchery fish, and does not allow for effective volitional passage, or trap and pass, of wild fish to the considerable amount (17 miles) of upstream habitat. A conceptual design for improving the facility was developed in 2006 by TetraTech/KCM Inc. in conjunction with USFWS, NOAA Fisheries, and ODFW; however, ODFW has not been able to acquire the approximate \$2 million for its construction. This project remains a high priority and is consistent with fish management needs for the basin.

### **2.5.4.2 Program Needs**

#### **Spring Chinook**

**Background:** Cedar Creek Hatchery produces approximately 110,000 Nestucca River origin spring Chinook subyearling smolts for release into the Nestucca Basin and collects eggs for STEP hatch boxes and classroom incubators..

**Potential Modification:** Pending completion of Coastal Spring Chinook Conservation Plan, but will need funding to re-start CWT program.

**Facility Upgrades Needed:** Pending completion of Coastal Spring Chinook Conservation Plan

## **2.5.5 Elk River Hatchery Recommendations**

### **2.5.5.1 Buildings & Driveways**

The Service, Hatchery, Electrical, Generator, and Steelhead buildings are generally in good condition, with no significant maintenance needs. The three residential buildings (08072, 08073, 08074) are all generally in good condition but 08072 and 08074 have various maintenance needs. Building 08072 maintenance needs include replacement of the asphalt shingle roof, carpet, and rear sliding door. In addition,

floor insulation should be installed. Building 08074 maintenance needs include replacement of the asphalt shingle roof, floor insulation should also be installed.

The domestic water delivery system was upgraded in 1997 and is sound and reliable. However, underground pipelines and valves, although useable, are original to the facility and should be replaced due to corrosion.

The asphalt driveway and hatchery surface areas are in good condition with the exception of minor deterioration of the asphalt along the edge of the drainage ditch.

#### **2.5.5.2 Raceways**

Twenty four modified, concrete Burrows-type rearing ponds are on site. Fourteen of the ponds are original 1968 construction and ten more ponds were added in 1971. Some minor cracks have occurred over the 40+ year use of these ponds, but they all remain useable and should be in service for many years without problems. Some 4" rearing water supply valves leak slightly, but none currently require replacement.

#### **2.5.5.3 Adult Collection and Holding Facilities**

Adult trap and holding facilities for Elk River fall Chinook salmon include a fish ladder, an alley-type trap and 10 separate aluminum-framed holding pens. Two of the rearing ponds (epoxy coated and fenced) are used during winter months as adult holding ponds for Chetco River fall Chinook salmon. A stand-alone building supplied with pathogen free well water houses the polyurethane-coated adult holding ponds for Chetco River winter steelhead. The collection and holding facilities are all sound.

#### **2.5.5.4 Water**

Presently Elk River Hatchery has adequate intake and meets discharge criteria. More stringent water quality or water conservation measures in the future should be anticipated. Thus the hatchery should continue to explore new technology that could improve water filtration, chilling, re-use within the hatchery system, and cleansing techniques for discharge, especially the design and construction of an abatement pond.

The fish rearing water supply is pumped from directly from Elk River. All intake pumps were refurbished in 1996. However, one of the intake pumps (#7) has damaged seals and should be refurbished.

The incubation water supply is pumped from a sub-surface well with a 7.5 horsepower line-shaft turbine pump. The screened incubation headbox, pipelines, valves and alarm system are all sound. Fiberglass incubation stacks are original to the facility and should be replaced due to degradation.

#### **2.5.5.5 Broodstock Collection**

Elk River fall Chinook brood is collected onsite at the hatchery trap. Broodstock consists primarily of returning hatchery-produced Chinook. The only naturally-produced brood currently utilized in the program consists of wild Chinook that

volitionally enter the hatchery trap. On average naturally-produced fall Chinook account for 3.5% of the broodstock. Additional broodstock collection methods need to be employed, likely tangle netting and/or seining lower Elk River, in order to meet broodstock goals identified in the HGMP.

Brood collection of Chetco fall Chinook is accomplished by seining in the tidewater portion of the Chetco River. Seining is conducted by a SFR funded 3 person crew, with assistance from the STEP program. Collection goals for number of fish, age composition, and proportion of hatchery fish are easily attained on most years

Brood collection of Chetco winter steelhead is accomplished by tangle netting in the lower 18 miles of the Chetco River. Tangle netting is conducted by a SFR funded 3 person crew. Tangle netting is supplemented with hook and line collection by local STEP volunteers. Collection goals for number of fish and proportion of hatchery fish are attained on most years.

#### **2.5.5.6 Monitoring and Evaluation**

##### **Elk River Fall Chinook (035):**

Elk River fall Chinook have been intensively monitored since 1992 in order to meet Pacific Salmon Treaty criteria for an Exploitation Rate Indicator Stock. Monitoring includes coded-wire tagging 200,000 Chinook annually and conducting creel and spawning survey projects to recover returning tagged adults. The intensive monitoring allows for the estimation survival rates, spawning escapement (hatchery and wild), and exploitation (harvest) of Elk River fall Chinook.

Mass marking of the remaining Elk River fall Chinook production was implemented in 2007 (2006 brood). Continued mass marking is necessary to adequately monitor the proportion of hatchery-produced fall Chinook spawning in the Sixes River and is also necessary in order to collect wild broodstock from Elk River.

##### **Chetco River Fall Chinook (096):**

Monitoring currently consists of minimal spawning surveys. The surveys allow for the estimation of escapement and the proportion of hatchery-produced Chinook in the spawning population. Monitoring necessary to evaluate survival rates and/or contributions to fisheries is not currently conducted. Release of coded-wire tag groups and subsequent recovery of tags is necessary to evaluate survival and ocean contribution of hatchery produced Chetco fall Chinook. Coded-wire tagging is also necessary to evaluate the success of proposed changes in release strategy (including acclimation).

South Coast spawning surveys need to be conducted annually in order to assess escapement, stray rates, and efficacy of various release strategies.

A creel program should be implemented periodically in order to assess the contribution of hatchery-produced fall Chinook to the in-river fishery.

Mass marking of Chetco River fall Chinook production was implemented in 2007 (2006 brood). Continued mass marking is necessary to adequately monitor the proportion of hatchery-produced fall Chinook spawning in the Chetco River.

#### **Chetco River Winter Steelhead (096):**

Releases of Chetco winter steelhead have been mass marked with an adipose fin-clip since 1994 (1993 brood). The fin-clipping allows for the estimation of the proportion of hatchery-produced steelhead in the natural spawning population, based on observations from spawning surveys conducted by the OASIS Project and tangle net sampling.

A creel program should be implemented periodically in order to assess the contribution of hatchery-produced winter steelhead to the fishery.

#### **2.5.5.7 Liberation Truck**

The liberation truck (Truck #63; circa 1985) currently shared by Bandon Hatchery and Elk R. Hatchery is wearing-out and is in need of replacement. Scheduling problems occur, especially in the spring time, when both hatcheries have intensive need for the truck in order to liberate trout, salmon, and steelhead to waters of their respective Districts. Logistically it would be better for each hatchery to have a liberation truck so that scheduling would not be an issue, and time spent by hatchery personnel shuttling the shared truck between facilities would not be wasted.

#### **2.5.5.8 Hatchery Residence**

Elk River Hatchery operates as a four man station. Since 1996, when a mobile home structure was condemned and destroyed, on site housing has consisted of three residences. With one employee living off site standby rotation falls to the other three employees. Replacing the fourth residence at Elk River Hatchery would improve staff efficiency and standby rotation.

#### **2.5.5.9 Production**

No significant changes in the current production schedule are anticipated. The facilities at Elk River hatchery are sufficiently flexible to accommodate any potential changes in production as a result of ongoing conservation planning efforts.

### **2.5.6 North Nehalem River Hatchery Recommendations**

#### **2.5.6.1 General Facilities Improvement Related to Fish Management in the Basin**

None identified.

### 2.5.6.2 Program Needs

#### Coho

**Background:** This 100,000 coho smolt program currently uses two broodstock sources in alternate years over the three year generation cycle (two years of NF Nehalem Stock 32 and one year of Fishhawk Stock 99). These broodstock are essentially locally founded from wild steelhead in the Nehalem Basin. Wild origin broodstock have not been integrated into the stock 99 program since at least 1995 and the stock 32 program since at least 1986.

**Potential Modification:** The North Coast Watershed District (NCWD) will be conducting an assessment of the existing coho program at Nehalem Hatchery to determine the performance of each stock relative to management objectives. There is a general perception by Nehalem basin anglers that Nehalem hatchery coho do not contribute well to the bay and river fishery. If this is true, one potential action would be to investigate the feasibility of incorporating Nehalem Basin origin wild coho broodstock into the hatchery program.

**Facility Upgrades Needed:** There are no needed improvements identified at this time other than general facility upgrades identified elsewhere in this report.

#### Winter Steelhead

**Background:** This 90,000 winter steelhead smolt program uses North Fork Nehalem (stock 32) hatchery broodstock originally derived from locally-founded wild steelhead. This program produces an additional 40,000 winter steelhead smolts for release into the Necanicum Basin.

**Potential Modification:** The NCWD is currently assessing the feasibility of constructing an acclimation facility on the lower North Fork Nehalem River. The intent of this facility will be to acclimate a portion of the North Nehalem production prior to release in to the North Fork Nehalem River. Acclimation of smolts in the lower river prior to release may help hold fish in angling areas longer and prevent rapid migration and straying to areas upstream of Nehalem Hatchery. This program will be run primarily by the NCWD STEP Biologist and volunteers.

**Facility Upgrades Needed:** There are no needed improvements identified at this time other than general facility upgrades identified elsewhere in this report.

#### Fall Chinook

**Background:** Nehalem Hatchery rears Trask origin (stock 34) fall Chinook fingerlings during the spring and summer for eventual release of 25,000 sub-yearling smolts into the Necanicum Basin. This program has been ongoing since the 1996 brood year and supplements a modest sport fishery in the Necanicum tidewater and river.

**Potential Modification:** This program has never been directly evaluated to determine fishery benefits or to measure its effect on Necanicum Basin wild fall Chinook. The NCWD intends to conduct an evaluation of this program in the near future. Future modifications to the program, if warranted, could include establishment of locally-derived wild fall Chinook broodstock or total elimination of the Necanicum Fall Chinook program.

**Facility Upgrades Needed:** There are no needed improvements identified at this time other than general facility upgrades identified elsewhere in this report.

## **2.5.7 Rock Creek Hatchery Recommendations**

### **2.5.7.1 Buildings & Driveways**

Vinyl windows and new siding should be installed in the residential and out buildings which have not yet been improved. Four of the residential buildings need to modernize the kitchens. The hatch house needs to be re-roofed and the building needs to be re-modeled. Presently, the hatchery uses the workshop area for spawning. Either a new workshop should be constructed or a spawning room so that the spawning area is a dedicated space. Additionally, office space in the hatch house needs to be improved to provide more desk/computer space and be more accessible to both the public and staff. A publicly accessible office will facilitate group check-ins and tours when the RockEd classroom is complete. There will also be an increasing demand on the restroom facilities at the hatchery with the RockEd classroom, thus the restrooms should be improved to meet ADA standards.

Driveway and hatchery surface areas should receive a new coat of porous asphalt.

### **2.5.7.2 Raceways**

All of the raceways should receive a concrete or rubberized coating to facilitate raceway cleaning and longevity plus reduce abrasions to fish. As needed, the concrete should also be refurbished or capped. Raceways 9 through 14 should be reconstructed to meet modern standards. All raceways should receive appropriate new valves and plumbing improvements to facilitate water flow, water conservation and fish health needs. Brood pen raceways need improved crowders and lifts for efficient sorting and handling of fish. Brood pens should also have covers installed for shading. Juvenile raceways should have predator covers installed.

### **2.5.7.3 Water**

Water intake and discharge will be one of the most limiting factors of hatchery operations in the future. Presently Rock Creek Hatchery has more than adequate intake and meets discharge criteria. Warm summer water is problematic for the hatchery, but continuing adjustments have allowed the hatchery to operate successfully. More stringent water quality or water conservation measures in the future should be anticipated. Thus the hatchery should continue to explore new technology that could improve water filtration, chilling, re-use within the hatchery system, and cleansing techniques for discharge.

For more immediate water improvement, the hatchery should extend the North Umpqua intake screens to the water sheer to reduce sedimentation and filling with gravel. Treatment filtration and UV capacity should be updated in the hatch house and installed in the brood and steelhead juvenile raceways. Abatement ponds should be checked for future capacity needs and potential filtration systems.

#### **2.5.7.4 Broodstock Collection**

Winchester Dam is the primary facility for collecting wild brood for the summer steelhead and spring Chinook hatchery programs. If the dam were removed, new methods of collecting wild brood to meet production goals would be necessary. A new fish ladder and sorting facility is scheduled to be built on Rock Creek, near the hatchery. This structure could be used for collecting hatchery brood, but few wild fish.

Brood collection of South Umpqua fish is accomplished by using Canyon Creek, Galesville and South Umpqua Falls fishways. A temporary trap at Happy Valley is also used for collecting fall Chinook and wild coho. Hook and line methods are also successfully used for the South Umpqua programs. Brood goals are normally met unless there are unusual stream flows which impact the effectiveness of the traps or hook and line efforts.

#### **2.5.7.5 Monitoring and Evaluation**

Rock Creek Hatchery and the STEP programs within the Umpqua basin have marked a high percentage of their fish for the last decade. This has allowed the basin to monitor hatchery stray rates and help track escapement. Much of the monitoring on the North Umpqua comes from the Winchester Dam fish counting station. However, the district also tracks hatchery strays by summer pool counts and spawning ground surveys.

Although the South Umpqua does not have a counting facility it has several fish ladders that are used for monitoring hatchery strays. Over 90% of the winter steelhead are acclimated to Canyon Creek. Thus the ladder at Canyon Creek can be used to document trends in run strength and the percentage of returning hatchery fish. Data such as age, length and sex ratios can also be collected. Spawning and snorkeling counts are also periodically used in the tributaries 10 miles above and below Canyon Creek to search for hatchery strays. In addition, South Umpqua Falls serves as an annual monitoring site to track hatchery strays.

With South Umpqua coho, the acclimated hatchery fish return to the base of Galesville Dam which is the end of anadromy. Periodically, total counts are conducted at the Galesville fishway to document the number of returning hatchery fish. The district also uses coho spawning counts and hatchery strays at Winchester Dam for tracking coho straying rates and potential escapement.

#### **2.5.7.6 Production**

The North Umpqua hatchery coho program was discontinued in 2006. This program failed to meet the stray rates for the NFCP and according to the Coho Conservation Plan put the population at risk. After the new fish ladder and sorting facility is constructed at Rock Creek, the department may conduct a review of this program to

see if stray rates goals could be achieved and whether or not restoring the hatchery coho program would fulfill department and societal goals for angling opportunity and recreation.

Trout production could be increased by 10,000 to 20,000 to provide a fall “lunker” program. It has been noted in the district that stocking large trout just before Labor Day at various lakes and impoundments is extremely popular.

### **2.5.8 Salmon River Hatchery Recommendations**

#### **2.5.8.1 Water**

Warm summer water can be problematic for the hatchery. The hatchery should continue to explore new technology that could improve water filtration, chilling, and re-use within the hatchery system. Drum lift and UV filtration should be incorporated for use during summer low flow periods.

#### **2.5.8.2 Screening**

Fish screening criteria by the NOAA Fisheries for anadromous salmonids is for screen openings not to exceed 3/32-inch in diameter and/or diagonally. The hatchery intake screen is 1/8 inch and does not meet NOAA Fisheries criteria. The intake screen should be retrofitted to meet NOAA Fisheries criteria.

#### **2.5.8.3 General Facilities Improvement Related Fish Management**

**Siletz Falls Trapping Facility:** The Siletz falls fish trap was built in the mid 1950’s and has been in full time operation since 1994. This trapping facility is a critical component to the implementation of the Siletz Basin hatchery programs for summer and winter steelhead. Summer steelhead brood stock are collected from this site and taken to Cedar Cr. Hatchery for spawning. Eggs are then transferred to the Salmon River Hatchery and reared to smolt for release into the Siletz River. The Siletz fish trapping facility includes a tower that houses two hydraulic winches and an engine used in transporting fish across the river from the trap to a transport truck. There is a need for the tower to be sand-blasted and repainted to maintain the structural integrity of the tower. Heavy cables are used to transport fish and people across the river safely and securely. The cable are worn and weathered and in need of replacement.

### **2.5.9 Trask River Hatchery Recommendations**

#### **2.5.9.1 General Facilities Improvement Related to Fish Management in the Basin**

**Gold Creek Weir:** The hatchery weir on Gold Creek blocks all upstream fish passage. There is habitat upstream suitable for spawning and rearing of coastal cutthroat trout and winter steelhead. ODFW needs to evaluate the production



potential for wild steelhead and cutthroat above the weir, and as consistent with existing or future management plans, consider passing wild steelhead and cutthroat above the weir. Any plans to pass wild fish will be accompanied by a cost:benefit analysis and a complete assessment of pathogen risks. Screening upgrades and water treatment facilities would be considered to be a necessary component of the analysis.

**East Fork Trask Water Diversion Dam:** The East Fork Trask water diversion dam supplies water to Trask Pond, a satellite facility of Trask Hatchery. The steep pass fish ladder associated with the dam may be size selective and does not meet ODFW fish passage guidelines. The NCWD will potentially be undertaking a review of the fish passage at this site in association with meeting fish management objectives for the basin. Assistance will be required from ODFW Fish Passage and Screening program.

#### **2.5.9.2 Program Needs**

##### **Fall Chinook**

**Background:** (Issue #1) - The existing program produces 113,000 fall Chinook (Trask origin Stock 34) subyearling smolts for release into the Trask River. This program has been underway since the early 1900's. Prior to mass marking which began with the 2007 brood year, some wild fall Chinook were likely incorporated into the hatchery broodstock. (Issue #2) - Trask Hatchery currently supplies up to 280,000 eyed-eggs for use in STEP unfed fry and classroom incubator programs. To increase fishery benefits and reduce competition with wild Chinook fry, the NCWD is currently exploring the feasibility of converting up to 100,000 of the unfed fry program to a hatchery subyearling smolt program. (Issue #3) – Loss of funding for CWT marking precludes ability to monitor fishery contribution of this stock.

**Potential Modification:** (Issue #1) - The NCWD will be investigating the need to begin purposefully integrating wild Chinook into this program. (Issue #2) – Ideally, any additional smolt fall Chinook releases would occur directly from Trask Hatchery so that returning adults could be captured and interaction with wild adults could be kept to a minimum. This will require use of acclimation space at Trask Hatchery, which when considered with other program needs, may be limited. (Issue #3) – Restore funding for CWT program.

**Facility Upgrades Needed:** (Issue #1) - There are no needed improvements identified at this time other than general facility upgrades identified elsewhere in this report. (Issue #2) - May need to review use of available acclimation space and water supply needs and make modifications where feasible.

## Spring Chinook

**Background:** Trask Hatchery produces approximately 245,000 Trask River origin spring Chinook subyearling smolts for release into the Trask and Wilson rivers and collects eggs STEP programs including 100,000 for the Whiskey Creek (STEP) facility. Modifications to these programs may be needed as action items are identified in the Coastal Spring Chinook Conservation Plan which will be completed by 2011.

**Potential Modification:** Pending completion of Coastal Spring Chinook Conservation Plan but will need funding to re-start CWT program

**Facility Upgrades Needed:** Pending completion of Coastal Spring Chinook Conservation Plan

### 2.5.10 Hatchery Program Assessment

ODFW has little capacity to evaluate whether state funded coastal hatchery programs are meeting their freshwater harvest objectives, or to evaluate the impact of the programs on wild stocks. The following areas highlight the basic research and monitoring needed to adequately assess the performance and impact of hatchery stocks.

#### Hatchery Program Monitoring

**Stock Assessment:** Coded-wire tags have typically been used to collect information on the harvest and escapement of a given release group of hatchery salmon. CWTs are recovered in sampling programs along the west coast of North America. The recovered tags are read under a microscope and assigned back to the release group. The number of tags recovered is then expanded to account for the sampling rate and the release group size to provide an estimate of fishery specific harvest or escapement.

For most hatchery programs, with the exception of Salmon River and Elk River fall Chinook, ODFW does not typically sample CWTs in Freshwater fisheries or on the spawning grounds. This issue is addressed below.

Since 2009 the coho stocks released by ODFW's coastal hatcheries were not marked with CWT's because of budget shortfalls. Beginning in 2010, long term funding that paid for marking the remaining production of Chinook was eliminated by NOAA. Thus, in 2010 there was no marking of Chinook or coho at state funded hatcheries (except Salmon River and Elk River fall Chinook).

*Implications:* Beginning with the 2009 brood-year, ODFW will have no data on the performance of each coho brood-year in the ocean fisheries. Similarly, if funding becomes available for FW fishery evaluation (see below) we will be unable to collect brood specific harvest data. Beginning with the 2010 brood-year, ODFW will have no data on the performance of each Chinook brood-year. Thus, ODFW will have no

means of evaluating whether changes in Chinook or coho hatchery programs have an effect on program goals.

***Freshwater fishery (FW) monitoring.*** ODFW currently maintains hatchery releases of salmon or steelhead in 13 coastal basins. Of these, the freshwater fisheries in only two (Salmon River and Elk River fall Chinook) are sampled regularly to determine total harvest, mark rate, and collect CWTs.

*Implications:* ODFW is unable to accurately assess the annual contribution of hatchery programs to freshwater harvest for the majority of programs. Similarly, ODFW is unable to assess the effect of program changes on FW harvest.

Current evaluation methodology:

To evaluate the harvest of a given brood-year in the freshwater fisheries ODFW biologists instead rely on punch card data. These cards are completed by anglers and returned voluntarily at the end of each angling season. Because the reporting is voluntary it is subject to several biases, outlined below:

Calculating harvest from punch cards-likely error sources: To calculate brood specific freshwater harvest a variation of the following formula is applied

$$\text{Brood-year Harvest} = \Sigma(((H_Y \times P_H)/P_3) + ((H_{Y+1} \times P_H)/P_4) + ((H_{Y+2} \times P_H)/P_5) + ((H_{Y+3} \times P_H)/P_6))$$

Where  $H_Y$  = total harvest in year Y

$P_H$  = The proportion of hatchery fish in the total harvest for that year

$P_{3-6}$  = The proportion of age 3-6 fish in the total harvest for that year

Total Harvest ( $H_Y$ ): This value is generally estimated using punch cards. The returned punch card harvest data is expanded to account for the anglers that did not return cards.

Potential sources of error:

- Anglers mis-report the catch area (known to occur in several fisheries)
- Non-representation of all anglers in the returned cards –i.e. cards may only be returned by successful anglers.
- Reporting may be inconsistent between basins
- Misreporting of species

The percentage of hatchery fish in the harvest ( $P_H$ ): Some fisheries only allow the retention of adipose clipped fish. In these cases the percentage of hatchery fish in the harvest is essentially 100%. For all other fisheries, the percentage must be estimated using punch card data. Since 2003, anglers have been asked to record a W for each unclipped fish that is caught. This distinction is used to estimate the number of clipped versus unclipped fish caught in the fishery. In addition, most hatchery programs have begun clipping the adipose fin on 100% of the production. This will improve the estimate of the percentage of hatchery fish in the harvest as there will no longer be a correction for the mark rate.

Potential sources of error:

- Anglers may not recognize adipose clips
- Anglers fail to record W for unclipped fish

Age of the harvested fish ( $P_{3-6}$ ): This can be estimated using either FW CWT recoveries (from the hatchery, spawning grounds, and any fishery sampling) and assuming they are representative of the harvested fish, or by collecting scales from harvested fish. ODFW currently relies on scale data collected in the late 1980's early 1990s to determine the age class structure of steelhead caught in FW fisheries, and CWT data to determine the age class of Chinook and coho.

Potential sources of error

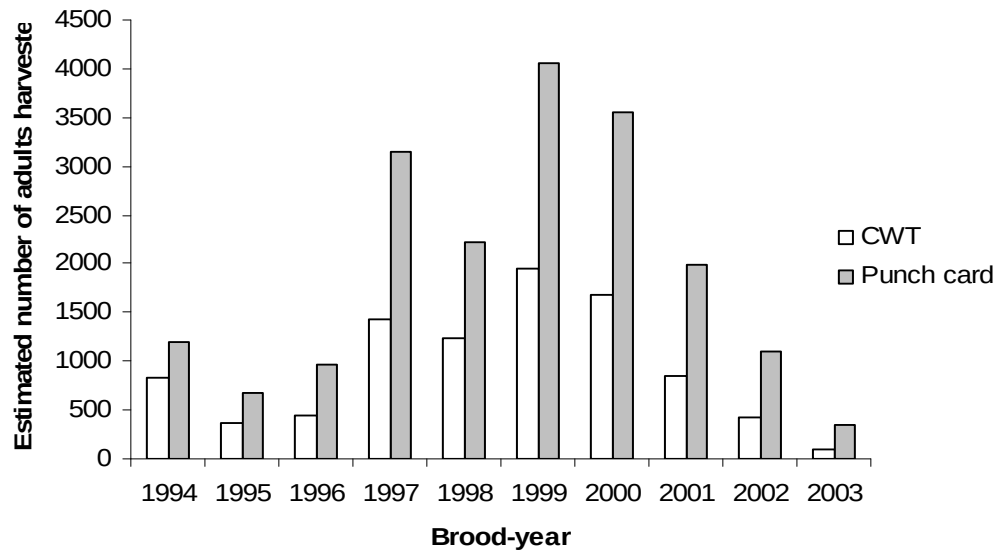
Scale data:

- Age class structure of the fish may have changed since last surveys due to changes in hatchery practices or environmental conditions.
- Yearly age class structure may differ from average age class structure

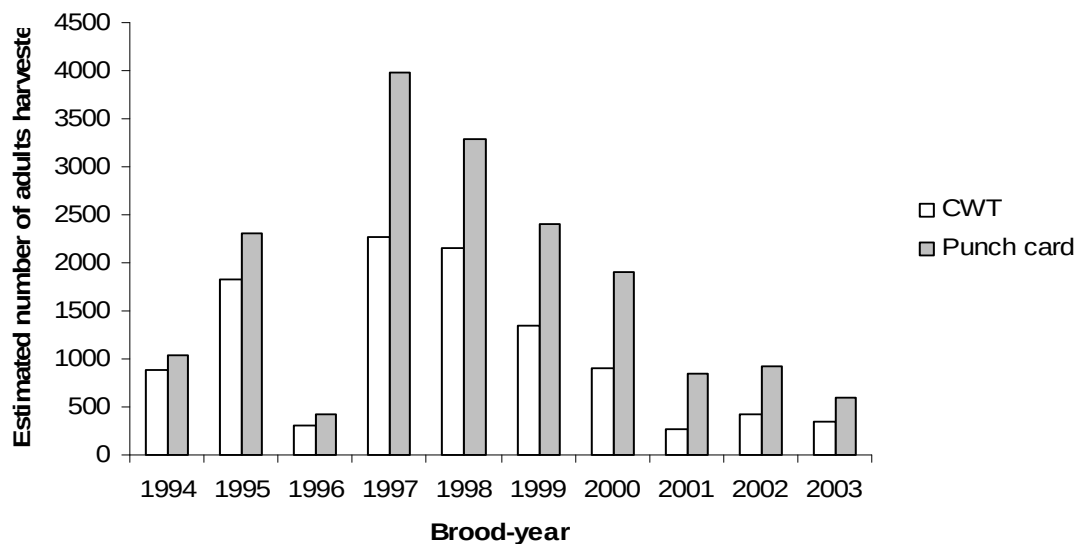
CWT data:

- Lack of hatchery collection for many programs (associated with releases at acclimation sites) means that low numbers of CWT's are collected in FW. Thus, the age class estimates have very wide confidence intervals.
- Recently, cuts to the coastwide CWT program have meant that the majority of programs no longer have a representative release group. Thus, this data will no longer be available.

In the Salmon River and Elk River fall Chinook fisheries the punch card data consistently overestimate harvest (Figs. 4 and 5).



**Figure 4. Comparison of harvest estimates in Salmon River freshwater fisheries based on punch card and CWT data. CWTs are collected during a creel program operated by ODFW under the PST.**



**Figure 5. Comparison of harvest estimates in Elk River freshwater fisheries based on punch card and CWT data. CWTs are collected during a creek program operated by ODFW under the PST.**

Conclusion: The uncertainty surrounding punch card estimates of FW harvest highlights the need for an independent assessment of harvest to ensure program goals are being met.

**Spawning grounds:** For most populations, there is very little/no data on the number of hatchery fish present on spawning grounds. The Salmon River and Elk River fall Chinook spawning grounds are surveyed as part of the Pacific Salmon Treaty agreements. Based on CWT recoveries during the surveys, ODFW estimates that 319-5,697 adult fall Chinook strayed onto the spawning grounds for a given broodyear. For the remaining basins, ODFW's OASIS project randomly surveys several coastal streams each year but there is no effort made to expand the recoveries as the scale of resolution (watershed) is too coarse.

*Implication:* ODFW has little data to indicate the degree of straying for most coastal hatchery programs.

**Wild Broodstock Programs:** The Oregon Department of Fish and Wildlife has implemented wild steelhead broodstock programs at many coastal hatcheries with the goal of improving angler opportunity and minimizing the impact of hatchery fish on wild stocks. However, there is little information with which to evaluate the success of the wild broodstock programs in terms of contribution to the fisheries and the impact on wild stocks. To manage these programs according to their objectives ODFW would like to conduct research into the following:

Wild population:

- Determine the population structure of each basin. Basins containing a single population would be managed differently from those contained more than one population.

Hatchery population

- Evaluate the effect of capture, transport, and holding techniques on pre-spawning mortality.
- Evaluate post-release behavior of hatchery stocks.
- Evaluate the relative harvest rates on hatchery production from wild-origin and traditional hatchery stocks
- Evaluate the relative harvest rates of wild and traditional hatchery stocks
- Evaluate impacts from removing wild adults from the naturally spawning population and determine rates of incidental catch-and-release mortality in fisheries.

Without this information ODFW has little means of knowing whether wild broodstock programs are meeting their fishery and conservation objectives.

**Artificial Selection:** There has also been little evaluation of whether changes in hatchery practices or the use of multi-generation hatchery broodstocks have constrained fisheries (time and space), and whether such effects can be reversed. For example, several programs no longer release fish at acclimation sites to minimize the straying of returning adults. Anecdotal evidence suggests that this practice has resulted in spatially confined fisheries. ODFW would like to evaluate methods to extend run timing and fishing effort while minimizing the impact to wild populations. Similarly, there is concern that broodstock collection practices select for

fish that migrate more rapidly through freshwater. ODFW would like to assess the differences in migratory behavior of wild and hatchery adult fish.

**Predator Attraction Hypothesis:** Several studies have shown that large numbers of juvenile salmon (steelhead and coho) are consumed within the estuary after release. It is not clear whether this level of predation is consistent with historical (pre-human influence) levels. However, one hypothesis holds that the number of predators has increased as a result of the hatchery releases. If true, the survival of wild fish may also be affected. To address this issue ODFW would like to evaluate the following

- Is the level of predation similar in river systems that have no hatchery influence relative to those with hatchery releases.
- Can hatchery practices be modified to reduce predation, e.g. modify release timing.

#### **2.5.11 Hatchery Research and Monitoring Program**

ODFW currently has no staff dedicated to explicitly monitoring and evaluating coastal hatchery programs. Elements of some programs are monitored by several individuals but there is no cohesive program that covers the entire coast. In other regions (e.g. Willamette and North East Oregon), hatchery programs are intensively monitored by federally funded ODFW staff. For example, in the Willamette system (5 hatcheries) ODFW has 9 full time staff and an annual operating budget of ~\$894,000. This level of investment provides a baseline of data for evaluating the effect of program changes as well as the opportunity to experiment with improvements to the program.

ODFW estimates that at least 2 FTE staff are required to ensure state funded hatchery programs are adequately monitored. These programs were monitored intensively in the 1980's and early 1990's. However, since that time budget cuts have eliminated the program. At a minimum one staff member should be dedicated to monitoring anadromous fish programs and one to freshwater fish programs at state run facilities. In addition, funding would ideally be available to cover program costs associated with experimentation and evaluation. This would improve our ability to develop research and monitoring programs that assess the effect of hatchery practices on harvest and straying. These positions would also work closely with the Oregon Hatchery Research center to ensure that facilities are adopting the most recent science in their operating procedures.

#### **2.5.12 Monitoring and Evaluation Recommendations**

The ODFW has identified two basic needs for monitoring and evaluation of coastal hatchery programs: 1) Established programs should include a plan and associated funding for long term monitoring. 2) Changes in programs (e.g. broodstock, release sites etc) should include a plan for monitoring the effectiveness of the change and the likelihood of unintended consequences.

#### **2.5.12.1 Long Term Monitoring**

##### **2.5.12.1.1 Chinook and coho salmon:**

To monitor the survival, distribution of ocean catch, contribution to fisheries, and extent of straying in coastal releases of salmon smolts, the department recommends the use of coded wire tags. To be effective these releases must be associated with freshwater fishery and escapement sampling at the time the tagged fish return. Ideally, each program would be monitored on an annual basis. However, the cost of such intensive monitoring is likely to be prohibitive. Therefore, the department proposes to investigate using a rotating panel design to evaluate stock performance. A similar design is used by ODFW to evaluate habitat, juvenile production, and adult returns of salmon and steelhead (Stevens 2002)

Coded wire tags are used throughout the west coast of the US and Canada to provide information on survival and exploitation rates in fisheries. Historically, ODFW used CWT's to monitor the majority of Chinook and coho smolt releases on the Oregon Coast. Within the last 5 years, reductions in funding have eliminated >90% of these programs. The utility of CWT data is dependant on a number of factors, including release group size, sampling rate, exploitation rate, and survival rate. Changes in the magnitude of any of these factors will dictate the inferences that can be made from a particular set of CWT return data. ODFW is currently reviewing the use of CWTs throughout the state. This workgroup will develop specific guidelines for release groups sizes and sampling programs that may be used to evaluate specific questions for coastal hatchery programs.

The following discussion highlights the factors that will be considered by ODFW when designing a CWT program for coastal hatchery Chinook and coho.

We conclude with recommendations for implementing a monitoring program based on two broad objectives:

- Monitoring total harvest vs. hatchery return and fishery distribution
- Monitoring fishery specific exploitation

##### **2.5.12.1.1a Factors affecting the uncertainty of CWT survival estimates:**

**A 2008 workgroup of the Pacific Salmon Commission (Pacific Salmon Commission Coded Wire Tag Workgroup. 2008. An action plan in response to Coded Wire Tag (CWT) Expert Panel Recommendations. Pacific Salmon**



**Comm. Tech. Rep. No. 25: 170 p.) outlined a number of factors that contribute to uncertainty in CWT survival and exploitation estimates. The following discussion is taken directly from the workgroup review.**

The principal factors that influence the uncertainty surrounding CWT-based estimates of exploitation rates (ERs) can be separated into two groups, factors affecting precision and those causing bias. In this section we focus on the following major factors affecting precision:

- number of fished tagged,
- sample rates for fisheries and escapements, and
- uncertainty in estimates of total harvest or escapement used to calculate sample expansion;

and those affecting the bias of estimates:

- sample coverage for fisheries and escapements,
- non-representative (non-systematic) sampling, and
- bias in catch or escapement estimates.

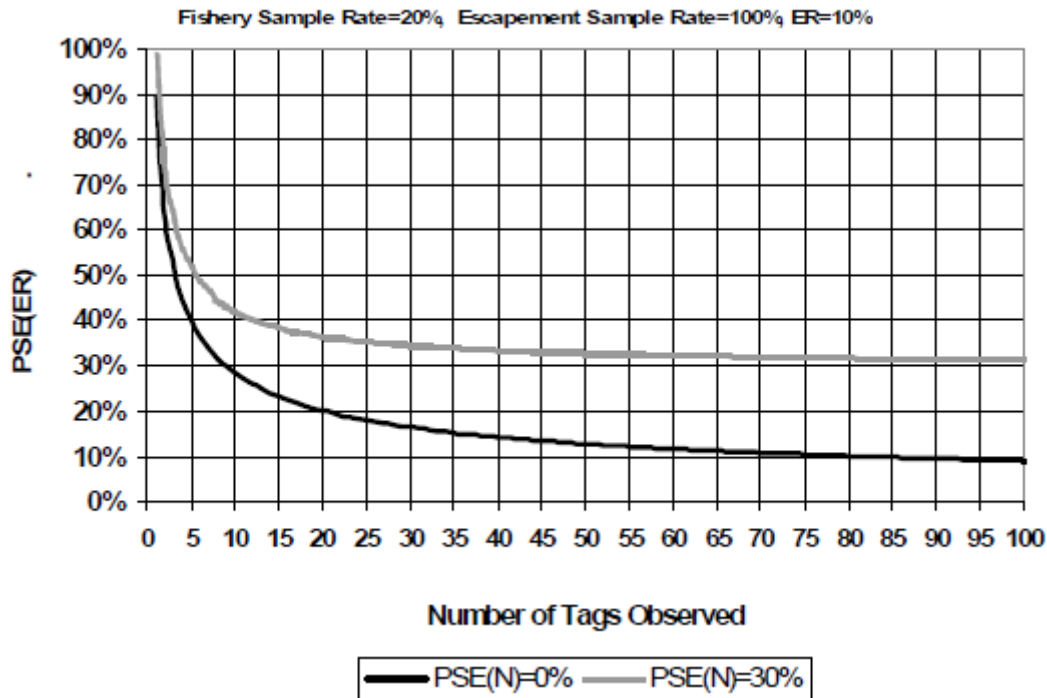
These factors can all be addressed during program planning or sample design. Thus, the quality of ER estimates can be changed and improved through efforts to improve tagging and sampling. The PSE used in the discussion below to represent uncertainty is a dimensionless statistic that expresses precision as a proportion of the estimated value:

$$PSE = \frac{100 * \sqrt{Variance}}{Estimated Value}$$

The precision of the estimates of tagged fish and ERs depends on the number of tagged fish observed in the harvest or escapement ( $m$ ), the sample rate ( $\phi$ ), and the precision of the estimate of the total catch or escapement being sampled ( $PSE(N)$ ). The number of tags observed depends on the number of tags released and the sample rate, as well as survival of the tag group and ER in the fishery. The tag group size, sample rate, and  $PSE(N)$  are components of the sample design.

The estimate of tagged fish or ER become more precise with increasing number of tags observed. The average PSE for an estimate of ER of 10% is shown in Figure X1, where it is assumed that all fisheries are sampled at a rate of 20%, escapements at 100% and the total harvest is estimated either at a  $PSE(N)$  of 0 or 30%. The trends in the figure are not linear, but the  $PSE(ER)$  decreases fastest as the number of tags increases from 0 to 10 tags, at which point an estimate of tagged fish ( $R$ ) has a PSE of 30%. This level of uncertainty has been set as the maximum acceptable by at least two groups evaluating the precision of estimates of tagged fish and ERs, the Washington Joint State-Tribal Workgroup that developed the coho cohort analysis database (Marianna Alexandersdottir, personal communication) and the PSC CTC. Both groups set 10 observed tags per stock-specific cohort as a minimum number required in a fishery stratum to reliably estimate ERs. A fishery stratum could be fishery and period for coho salmon and fishery-period and age for Chinook salmon. As the number of observed tags increase beyond 10 the  $PSE(R)$  decreases

asymptotically towards zero. When  $PSE(N)$  is greater than zero, i.e., harvest or escapement is estimated, then the  $PSE(R)$  is limited by the precision of the total, i.e., if  $PSE(N)$  is 30%, the  $PSE(R)$  cannot be smaller than 30% (Figure 6)



**Figure 6.** The precision (PSE) of the estimate of an ER of 10% versus the number of CWTs recovered in the fishery stratum for which the ER is being estimated, at two levels of precision for the estimate of total catch or escapement abundance ( $PSE(N)$ ) being sampled (0%, or known without error, and 30%), given a 20% sampling rate in the fishery and 100% in the escapement.

#### *Tag Group Release Size*

Increasing the tag group size will increase the number of tagged fish recruiting to fisheries and escapement and consequently, the number of tagged fish in samples to calculate fishery parameters. The PSE for the estimate of a 10% ER decreases asymptotically as the size of the tag group increases (Figure 7). However, the survival of the group to return also affects the precision, as shown in Figure 7, as fewer tagged fish return for stocks with lower survival rates, resulting in less precise estimates of ERs. Survival to age 2 after release cannot be directly controlled through sample design, but as these tag groups are generally hatchery groups, hatchery practices can affect survivals. Therefore, hatchery stocks with low survivals require larger releases; if survivals are very low, they may not be good candidates for use as indicator stocks.

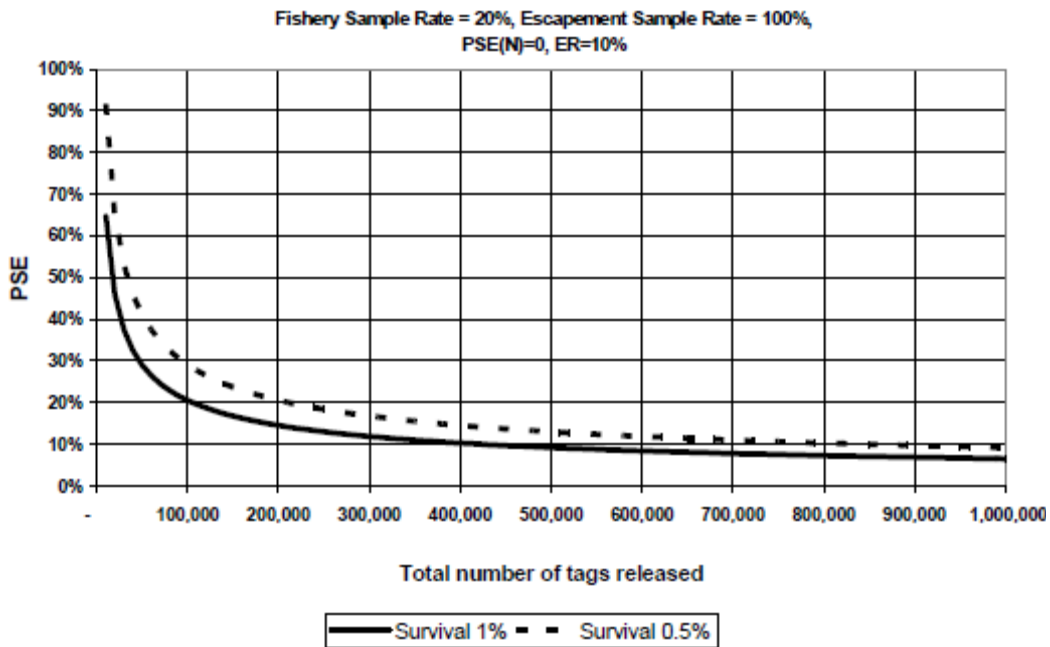
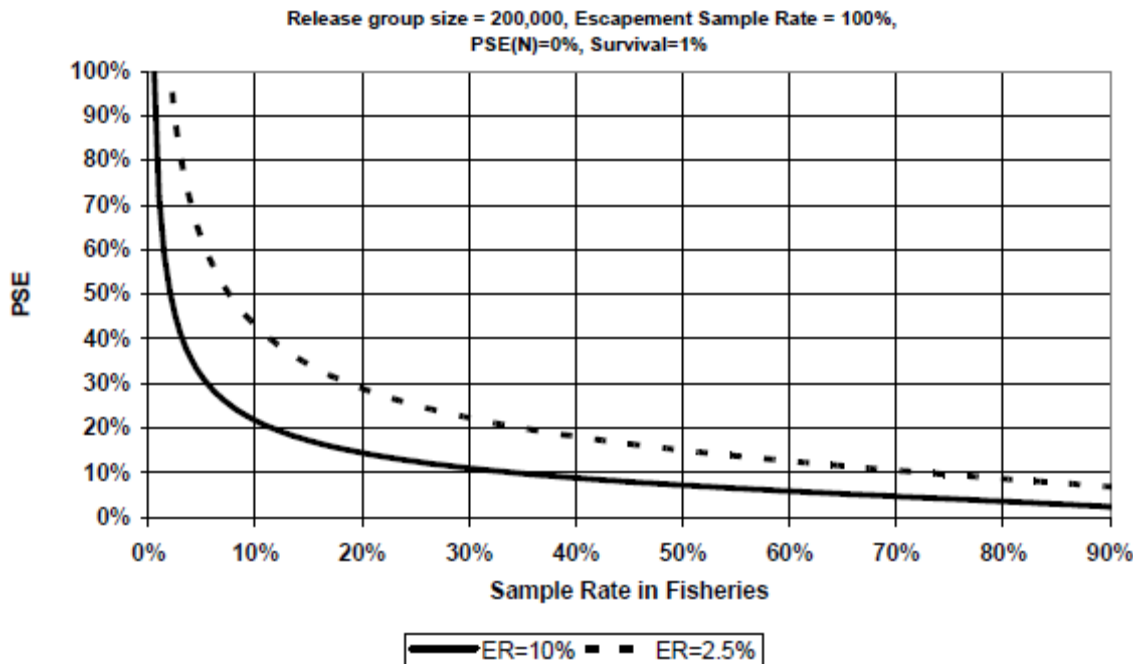


Figure 7. The precision (PSE) of the estimate of an ER of 10% versus the number of CWTs released at two levels of survival to age 2 (1% and 0.5%), given a 20% sampling rate in the fishery and 100% in the escapement and knowledge of the total catch abundance without error (PSE(N)=0).

### *Sample Rates in Fisheries*

The sample rate in fisheries is an important sample design factor. As sample rates increase, the number of tags used to estimate cohort size and ERs increases and the PSE for ERs decreases asymptotically (Figure 8). The examples illustrated in Figure 8 use a release group of 200,000 fish and average survival rates of 1%, which results in a cohort of 2,000 fish. Figure 8 shows the precision for ERs of 2.5% and 10%, assuming all total catches sampled were known and that all escapement returned to the hatchery and were sampled at 100%.



**Figure 8.** The precision (PSE) of the estimate of an ER of 10% and 2.5% for a fishery versus the sampling rate in the fishery, given a 100% sampling rate in the escapement, knowledge of the total catch abundance without error (PSE(N)=0), a CWT release group size of 200,000, and a survival from release to age 2 of 1%.

### *Sampling Rates in Escapement*

Over the last 20 years, there has been a general decrease in total ERs (due to increasing regulation of fisheries) for many stocks and increasing rates of escapement. Consequently, recoveries of CWTs in escapements are increasingly important to determine the precision of ER estimates because the escapement represents a larger proportion of the total cohort.

The proportion of the escapement that returns to a hatchery where it can be easily sampled and the proportion that are found on the spawning grounds are important factors affecting the precision of CWT-based estimates of ERs. The precision of the estimate of the ER depends on the proportion spawning outside the hatcheries, the sampling rate on natural spawning grounds where tagged fish are likely to be found, and uncertainty in estimates of total spawning escapement. If natural escapements are not sampled for CWTs, bias in estimation of ERs will be a major concern where significant numbers of hatchery fish are on the spawning grounds. Examination of Figure 9 shows the effect of spawning of tagged fish outside of the hatchery, where sampling rates are lower than in the hatchery. Given increasing total brood ER, the PSE of the total ER decreases as the ER increases, due to the increase in tags observed in the fisheries. When 100% of the escapement returns to the hatchery and is sampled at 100%, then the PSE(ER) rapidly falls to 10%. However, if all tagged fish in the escapement are in the natural spawning grounds, then the PSE(ER) does not decrease as rapidly as fewer tags are recovered in escapement (Figure 9).

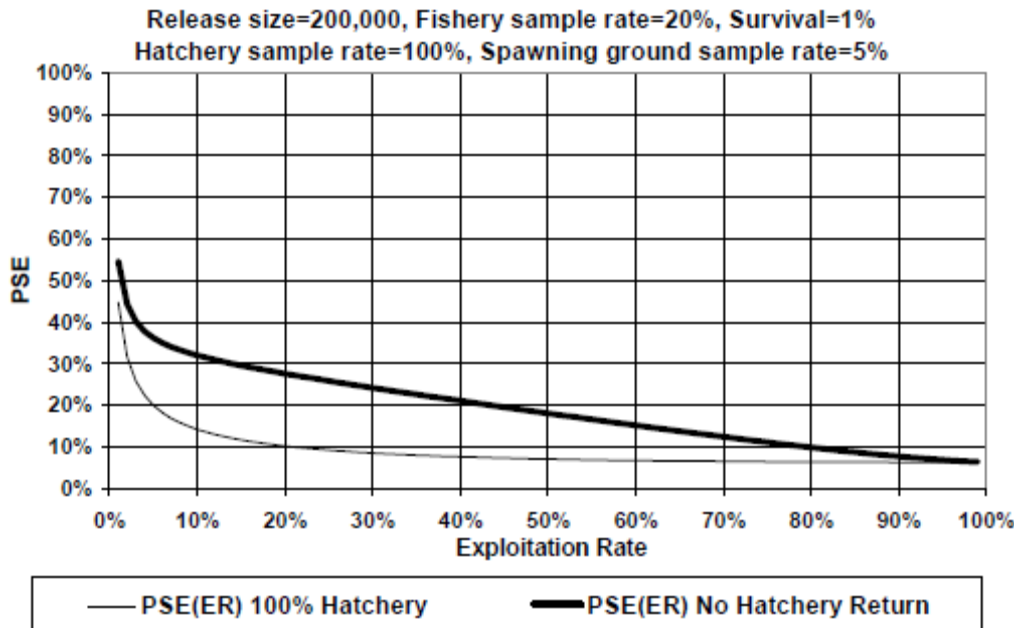


Figure 9. The precision (PSE) of the estimate of ER versus the magnitude of the ER estimate for the case where 100% of the escapement returns to the hatchery that has 100% sampling and the case where 100% goes to the spawning grounds that have a 5% sampling rate. A release size of 200,000 is used with survival to Age-2 of 1% and the fishery sampling rate is 20%.

#### 2.5.12.1.b. Monitoring survival and exploitation of Oregon coastal coho and Chinook.

The following is a general discussion of the likely tagging and sampling levels needed to accurately evaluate coastal programs, based on consideration of the factors identified above.

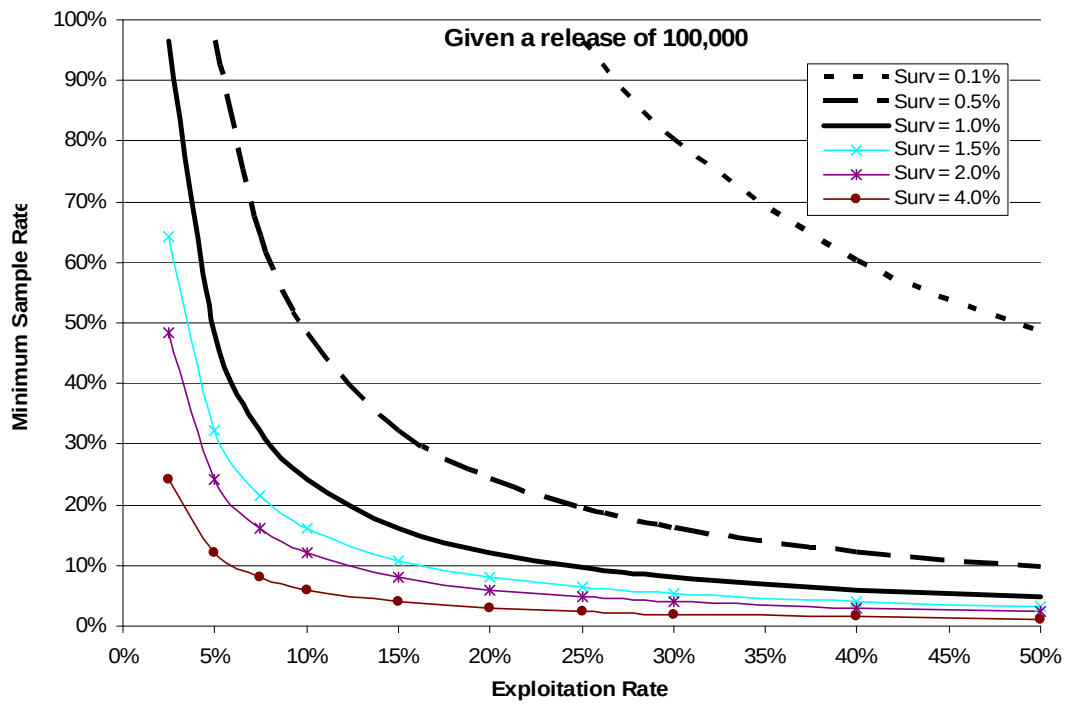
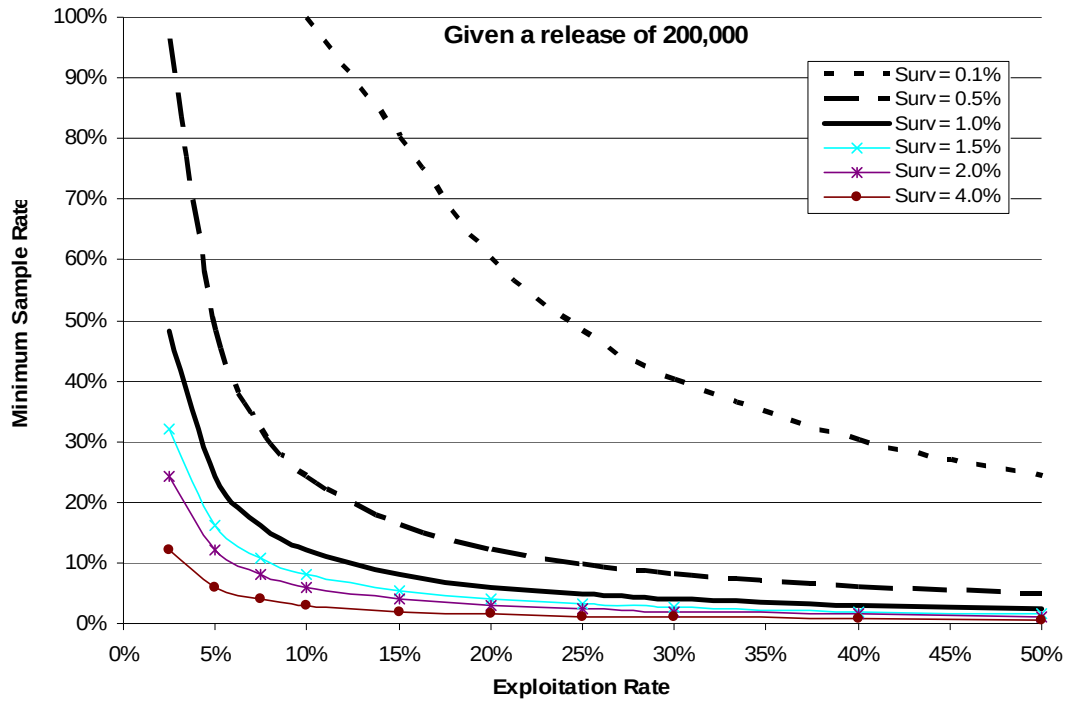
The majority of Oregon's coastal Chinook and coho programs release 50-100,000 smolts annually. Ocean and terminal (Freshwater) ERs vary between 3-43% and 6-56%, respectively, of the total surviving fish (Table 53). Survival rates vary between 0.4 -10%. The survival of the North Umpqua coho releases is biased by dam counts of returning fish at Winchester Dam.

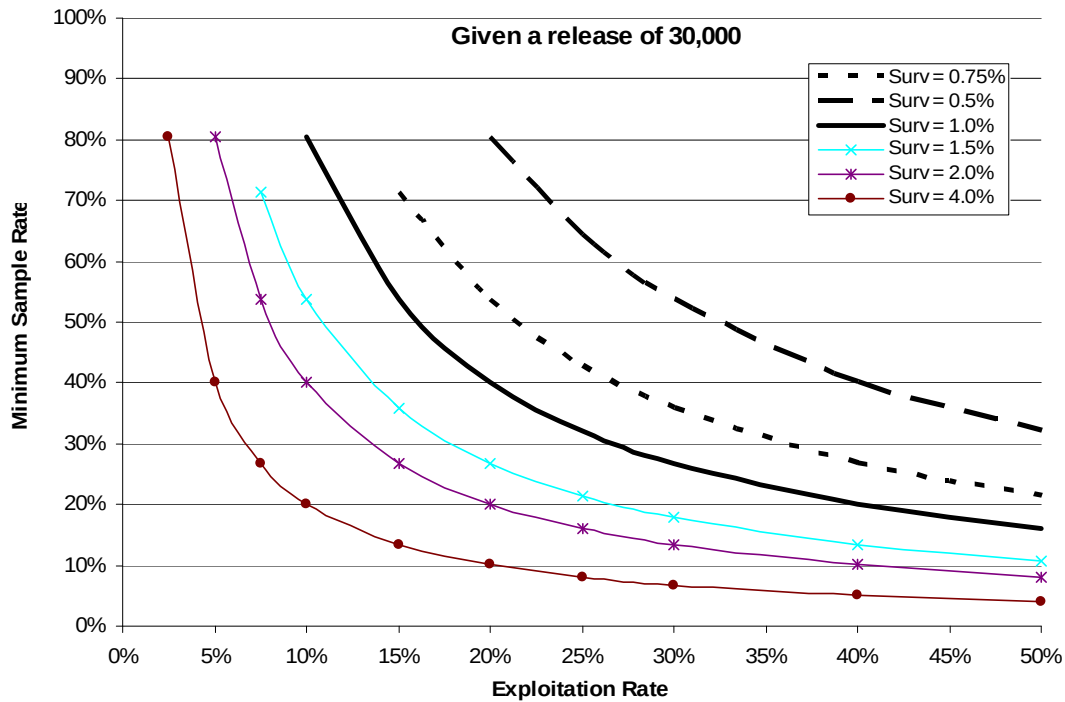
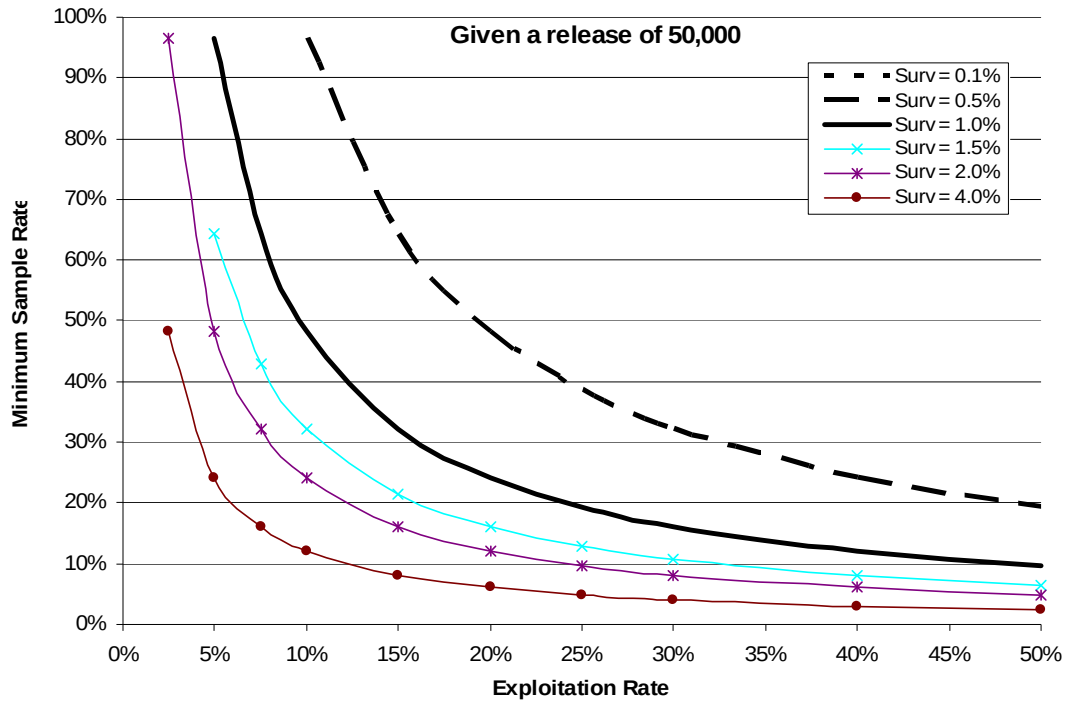
Table 62. Exploitation rates and survival of coho and Chinook stocks released by ODFW's coastal hatchery facilities. Note: Stocks which release <30,000 smolts,

have no hatchery recoveries, or for which there are no freshwater fishery harvest estimates are not included.

| Species        | Stock                         | Release Basin       | Brood years              | Average smolt release number | terminal ER | Ocean ER | Escapement | Survival |
|----------------|-------------------------------|---------------------|--------------------------|------------------------------|-------------|----------|------------|----------|
| Coho           | Nehalem (32)<br>Fishhawk (99) | Nehalem             | 1995-2004                | 186,113                      | 19.55%      | 9.71%    | 71%        | 1.15%    |
| Coho           | Trask (34)                    | Trask R             | 1995-2004                | 153,321                      | 6.03%       | 8.47%    | 86%        | 4.00%    |
| Coho           | Umpqua (55)                   | Umpqua R,<br>Nth Fk | 1995-2004                | 105,695                      | 26.71%      | 3.23%    | 70%        | 10.48%   |
| Spring Chinook | Trask (34)                    | Trask R             | 1994-2003                | 101,982                      | 48.03%      | 32.00%   | 20%        | 1.13%    |
| Spring Chinook | Trask (34)                    | Wilson R            | 1994-2003<br>(excl 2001) | 145,063                      | 25.90%      | 43.33%   | 31%        | 0.43%    |
| Spring Chinook | Nestucca (47)                 | Nestucca R          | 1994-2003                | 116,402                      | 56.56%      | 34.75%   | 9%         | 0.87%    |
| Spring Chinook | Umpqua (55)                   | Umpqua R,<br>Nth Fk | 1994-2003                | 316,232                      | 15.89%      | 16.23%   | 68%        | 3.43%    |
| Fall Chinook   | Trask (34)                    | Trask R             | 1994-2003                | 78,768                       | 30.72%      | 22.07%   | 47%        | 2.66%    |
| Fall Chinook   | Salmon R (36)                 | Salmon R            | 1994-2003                | 202,592                      | 27.16%      | 29.36%   | 43%        | 1.69%    |
| Fall Chinook   | Coos (37)                     | Coos Basin          | 1994-2003                | 760,767                      | 15.65%      | 38.23%   | 46%        | 0.98%    |
| Fall Chinook   | Elk R (35)                    | Elk R               | 1994-2003                | 325,508                      | 10.80%      | 26.49%   | 63%        | 3.05%    |

Under different scenarios of survival, exploitation, and release group size, we can calculate the sampling rate needed to return at least 20 tags (Fig 10)





**Figure 10.** Minimum sampling rate for the evaluation of freshwater fishery impacts given an expected exploitation rate (2.5-50% of total recoveries), release group size (30,000-200,000), and survival estimate (0.1-4%). The estimates are based on the probability of recovering 20 tags in the fishery being >80%, thus giving a



**PSE of 30% in instances where the total harvest is known or is estimated with little bias.**

Using the estimates of harvest and survival from Oregon’s coastal programs (Table 53) and the modeled data in Figure 10, we can calculate the release group size and sampling rate needed under different evaluation scenarios. In each of these scenarios we assume that 20 tags will be recovered in the strata of interest (e.g. ocean fisheries) to stay below a maximum PSE of 30% (ref above). Ocean fisheries are sampled at 20% per Pacific Salmon Treaty agreements.

*Scenario 1: Monitor Ocean versus Freshwater exploitation, total survival, and the distribution of ocean harvest.*

This monitoring program provides the most basic level of information and may be used to estimate the relative proportion of harvest in freshwater versus ocean, and the relative proportion of the release that is harvested versus escapes to the hatchery or spawning grounds. For the majority of Oregon’s coastal stocks this level of monitoring is adequate. Under this scenario ODFW is unable to determine point estimates of exploitation in specific ocean fisheries with any degree of confidence. The sampling rates in Table 54 are based on a minimum ER of 30% in freshwater (70% in ocean). A number of Oregon’s Chinook and coho are exploited at less than 30% in the terminal fishery. Therefore, tagging levels or sampling rates will have to be adjusted accordingly.

**Table 63. Sampling rate in freshwater terminal fisheries given a range of release group sizes and survivals.**

|          |     | tag group size |       |        |
|----------|-----|----------------|-------|--------|
|          |     | 30000          | 50000 | 100000 |
| survival | 0.5 | 50%            | 32%   | 16%    |
|          | 1   | 27%            | 16%   | 8%     |
|          | 1.5 | 18%            | 11%   | 5%     |
|          | 2   | 13%            | 8%    | 4%     |

Given the current ocean sampling rate (20%), average survival of coastal Chinook and coho stocks and ocean exploitation rates (Table 54), we typically expect to recover at least 20 tags in all ocean fisheries combined for release groups of >30,000. Where expected survival (harvest + escapement) is less than 1.5%, release group sizes of 30K are insufficient to meet the 30% PSE guideline for estimation of ocean harvest.

*Scenario 2: Monitor ocean fishery specific exploitation.*

Given that the majority of ODFW's coastal Chinook and coho programs release <100,000 smolts annually, it is unlikely we will be able to accurately determine exploitation in ocean fisheries that harvest 5% or less of the total harvest (given the current 20% sampling rate) (Table 55). For fall Chinook, estimates of fishery specific exploitation may be inferred from the Salmon River and Elk River fall Chinook programs which tag ~200,000 smolts annually. As mark Selective fisheries become more common it may become necessary to obtain more accurate estimates of exploitation of North migrating stocks off Washington, Canada, and Alaska.

**Table 64. Tag group size to ensure sufficient recoveries in a fishery that harvests 1-20% of the total harvest given a survival range of 0.5-2%**

|          |     | Exploitation Rate |        |        |        |
|----------|-----|-------------------|--------|--------|--------|
|          |     | 1%                | 5      | 10     | 20     |
| survival | 0.5 | 2413461           | 482690 | 241344 | 120671 |
|          | 1   | 1206729           | 241344 | 120671 | 60334  |
|          | 1.5 | 804486            | 160895 | 80447  | 40222  |
|          | 2   | 603364            | 120671 | 60334  | 30166  |

*Frequency of sampling:*

Each of these monitoring programs could be run annually. However, the cost is likely to be prohibitive. As an alternative, candidate programs on the North and South Coast could be monitored annually, and the remaining programs would be evaluated periodically. The viability of this approach should be investigated given the changes in ocean conditions and fishery regulation that might impact comparisons among programs.

**2.5.12.1.2 Steelhead:**

Long term monitoring of steelhead releases from ODFW hatcheries should include provision for evaluating freshwater harvest, stray rates, and survival.

*Harvest:*

The majority of steelhead harvest occurs in freshwater in the basin of release. Given this, and the high cost of CWT programs, the department does not recommend the use of CWT's for monitoring exploitation and survival. Instead, ODFW recommends

investigating the relationship between total catch reported on harvest cards (returned by anglers each year) and total catch from a creel analysis. In addition, semi annual collections of scale data from harvested fish would allow the assignment of harvest to a particular brood-year. The relationship between harvest card data and creel harvest estimates may then be used to estimate total harvest in subsequent years based on harvest card data alone. Ideally, the utility of harvest cards would be evaluated periodically to account for changes in demographics and reporting accuracy.

*Straying:*

The percentage of hatchery origin steelhead spawning naturally in the wild poses a great deal of concern to fisheries managers. ODFW has a number of policies that set guidelines as to the percentage of stray hatchery fish permitted to spawn naturally in individual basins and subbasins. Thus, it is important for fisheries managers to know the numbers and distribution of hatchery strays spawning naturally in the wild. The department recommends monitoring stray rates in basins that release hatchery steelhead by conducting annual spawning ground surveys. These surveys would ideally be integrated with the current steelhead monitoring program but would provide additional funding to assess stray rates at the basin level.

#### **2.5.12.2 Short-term Monitoring**

The ODFW recommends that changes in coastal salmon and trout programs be evaluated for their effectiveness at meeting management goals. For example, changes in release site, release number, broodstock, and rearing practices should be evaluated to ensure they have the desired effect. Depending on the management goal monitoring may target any of the following:

*Juveniles:*

- Residualism of juveniles following release
- Survival of juveniles in freshwater
- Interaction of juveniles with wild fish
- Migratory behavior following release

*Adults:*

- Timing of return
- Contribution to harvest
- Stray rates
- Interactions with wild fish

Within this category ODFW currently recognizes a need for consistent evaluation of wild steelhead brood stock programs with respect to each of these factors. The following discussion outlines a research plan to quantify the utility of using wild steelhead broodstocks in place of traditional hatchery broodstocks.

##### **2.5.12.2.1. Oregon Coast Steelhead Broodstock Management Research Plan**

The intention of this plan is to provide a comprehensive list of research questions that should be answered to provide managers with sufficient data to decide how to manage the hatchery steelhead programs on the Oregon coast for maximum harvest benefit while minimizing the impact to wild stocks.

**2.5.12.2.1a Objective 1: Evaluate population structure of steelhead within each basin of interest**

*Background:* To determine the potential impact of broodstock collection methods and offsite releases of hatchery-reared juveniles we must first understand the population structure of steelhead in each basin where hatchery fish are being released.

*Task 1.1 Conduct mtDNA analysis of scale/tissue samples collected within each basin.*

*Task 1.2: Determine whether there are any sub-populations within the basin that warrant separate management actions.*

**2.5.12.2.1b Objective 2: Evaluate the phenotypic variation in adult migratory behavior.**

*Background:* Within an adult population there may be several behavioral phenotypes, including fish that migrate rapidly versus slowly, fish that are aggressive versus passive, and fish that mature in the lower river versus the upper river. To determine whether current broodstock collection techniques bias the contribution of a subset of phenotypes towards future generations we must understand the variation in behavioral phenotypes within each basin. The use of this information will depend on management preferences for minimizing selection relative to wild traits, or maximizing selection relative to desirable traits for a fishery.

Sub-Objective 2.1: Evaluate the variation in freshwater residence timing of fish from the traditional and wild broodstocks and from wild fish caught in the lower river.

*Task 2.2.1: Mark (radio tag) adult fish (hatchery and wild) in the lower river and document migratory behavior until spawning.*

*Task 2.2.2: Assess variation in the stage of maturity at entry to the river.*

*Task 2.2.3: Determine whether there are any predictors of migratory behavior during early FW residence*

**2.5.12.2.1c Objective 3: Evaluate the impact of collection techniques on fish health:**

*Background:* Handling and holding induce considerable stress in both hatchery and wild fish. In addition, physical injury may result from handling that leads to

infection. Both stress and disease lower the fitness of breeding individuals and may impact the fitness of resulting offspring.

*Task 3.1: Measure the stress response in adults collected by angling or netting (F, Glu, Ions, Lactate)*

*Task 3.2 Measure physical injury as a result of angling or netting*

*Task 3.3: Measure post capture recovery, survival, and fitness in the holding facility*

Sub-Objective 3.1: Evaluate methods to improve pre-spawning survival and health.

*Task 3.1.1: Evaluate the efficacy of using anaesthetic during transport from the capture site to the holding facility*

*Task 3.1.2: Measure post capture recovery, survival, and fitness in alternative holding facilities (tanks vs. raceways vs. artificial streams)*

#### **2.5.12.2.1d Objective 4: Evaluate the likely effect of hatchery stocks on wild steelhead stocks within the basin**

*Background:* To ensure the outcomes of management actions are consistent with the Native Fish Conservation Policy ODFW must determine the likely impact of hatchery releases (both traditional and wild broodstocks) on wild stocks.

Sub objective 4.1 Evaluate post-release behavior of hatchery stocks.

*Task 4.1.1 Measure residualism, diet, competition with wild fish, timing of migration, and survival of juvenile hatchery fish to the ocean*

*Task 4.1.2 Measure adult survival and migratory behavior (migration rates, straying etc)*

Sub objective 4.2: Evaluate the potential impact of strays on the fitness of wild stocks

*Task 4.2.1 Estimate the likelihood of breeding with wild fish (linked to task 4.1.2)*

X.2.1e Objective 5. Determine the relative contribution rate of hatchery broodstocks to freshwater fisheries.

*Task 5.1: Conduct creel to estimate capture of wild vs. broodstock fish. (Linked to Task 4.1.2)*

### **3. Performance Criteria**

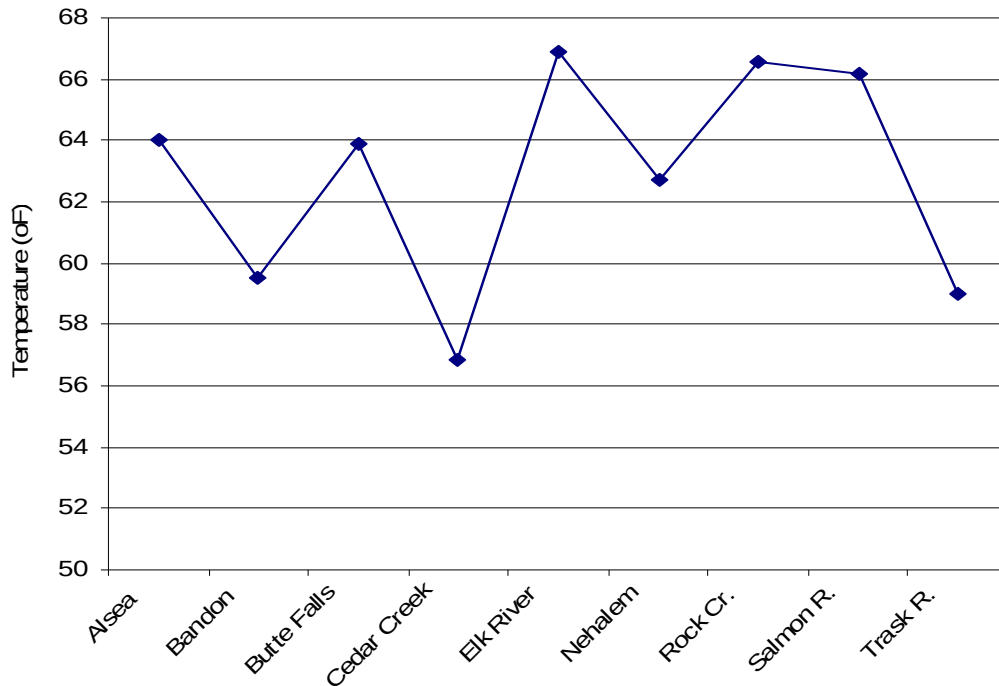
#### **3.1 Water Quality and Disease Prevention**

##### **3.1.1 General Review and Evaluation of Hatchery Effluent Quality**

The quality of hatchery effluents may be affected by the presence of total suspended and settleable solids in effluents, and use of drugs and chemicals to treat eggs and fish. Hatchery effluents may gain temperature from the atmosphere particularly during the summer months. A settling or pollution abatement pond can minimize the concentrations of pollutants in hatchery effluents before discharge and comply with the NPDES permit limitations.

##### **Temperature:**

During summer months, cold water fish like salmon and trout may easily get stressed. On the contrary, pathogens at warmer environment get vigorous growth or multiplication causing more diseases to fish. Consequently, more drugs or chemicals are used to treat or control fish diseases and parasites, which eventually affect the effluent quality. Although effluent temperature is a reflection of the ambient temperature of supply water, yet it may gain a few decimal points of heat from the air through hatchery operations. The NPDES permits require that effluent temperature shall not exceed the maximum limitation of 77°F, although there are habitat specific temperature limitations during salmonids spawning, migration, and juvenile rearing (OAR 340-041-0028). The effluent temperatures in coastal hatcheries were monitored for a period of three years and it was observed that July and August were the highest temperature months. The three years average temperature in effluents of coastal hatcheries for the months of July and August is shown in Figure 11.

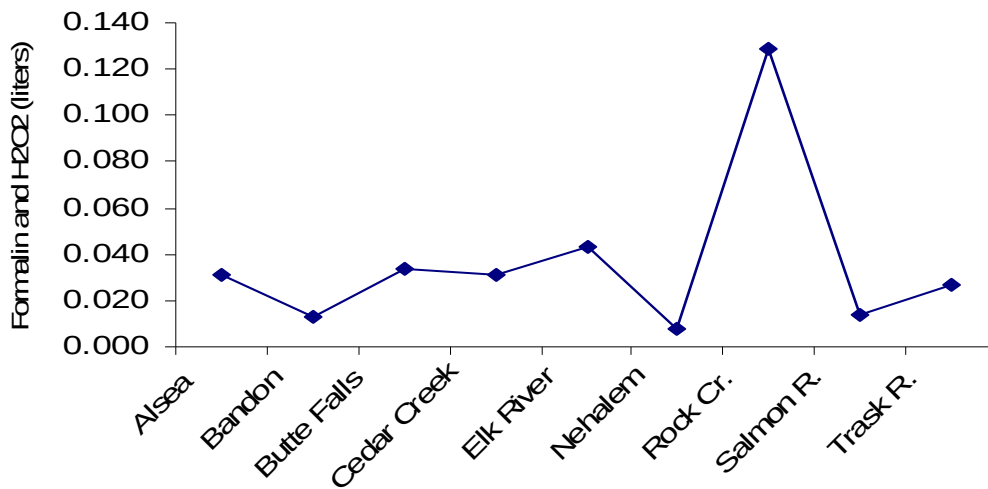


**Figure 11. Average effluent temperature (°F) measured between 3:00 pm and 5:00 pm for the months of July and August, 2003-2005.**

Analysis of three years' temperature data from the hatchery outfalls and the mixing zones revealed that the small increase in temperature at the outfalls did not adversely affect the temperature at the mixing zone and also did not affect salmonids spawning, migration, and juvenile rearing in the receiving stream.

#### **Formalin and Hydrogen Peroxide Use:**

Formalin and hydrogen peroxide are the USFDA approved chemicals for use in aquaculture. These two chemicals are commonly used in hatcheries to control fungal and parasitic infections in eggs and fish. The NPDES permits require that chemically-treated wastewaters shall be sufficiently diluted as per manufacturers' recommendation for safe disposal. A pollution abatement pond is helpful to sufficiently dilute the chemically treated wastewaters. Depending on the frequency and severity of fungal and/or parasitic infections, each facility uses these chemicals as prescribed by fish pathologists. The average quantity of formalin and hydrogen peroxide used to produce one pound of fish at each coastal hatchery is shown in Figure 12.

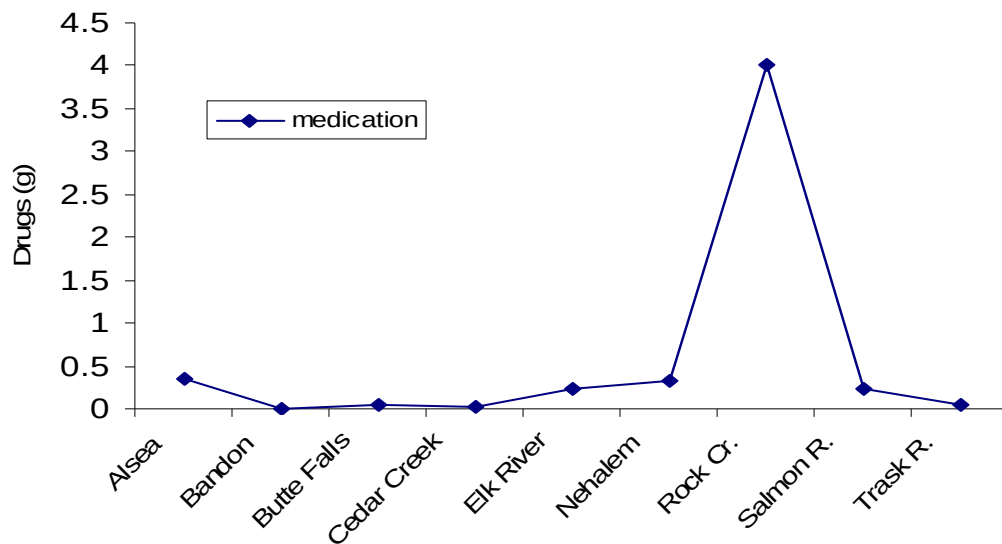


**Figure 12. Quantity (liters) of formalin and hydrogen peroxide used per pound of fish produced.**

**Use of Medication/Drug:**

Use of medication and drugs to treat fish may also affect the quality of hatchery effluents although these are used as food ingredients in the form of medicated feed supplied by food manufacturers. Very little of these drugs may enter the rearing water. These are mainly the USFDA approved or INAD drugs. No monitoring is conducted to determine the concentrations of drugs in hatchery effluents because of their negligible quantity and also because the measurements would be expensive that require sophisticated technology. The average data of the last five years of medicated drugs use to produce one pound of fish at each hatchery is shown in Figure 13.

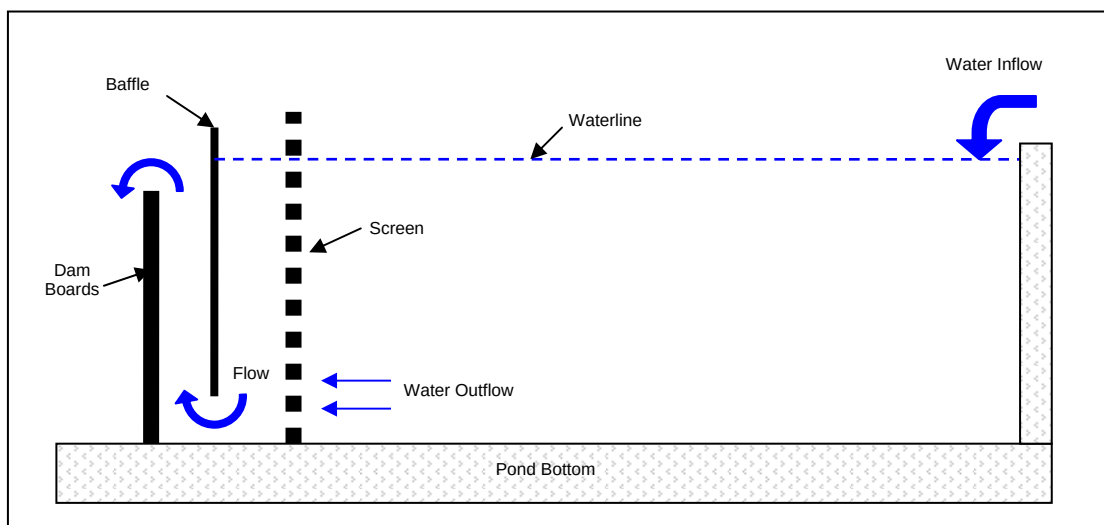




**Figure 13. Quantity of drugs used (g) used per pound of fish produced.**

**Water Flow/Discharge System:**

Almost in all ODFW operated fish hatcheries, water is supplied at the surface of pond's head end and effluents too are discharged from surface level at the tail end over dam boards, which doesn't create water current at the pond bottom level. Consequently, most of the solid wastes are accumulated or deposited on pond bottom and increase the risks of permit violation during cleaning operations. Deposition of solid wastes (uneaten food and fecal matter) may also create favorable environment for pathogens to grow and cause more diseases. A simple modification to the existing water discharge system by inserting a baffle in between screen and dam boards will create flow at the pond bottom level and redirect the effluent through the pond bottom (see Figure 14). This will to some extent be a self cleaning method where effluents will continuously carry solid wastes from the pond bottom and help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations. The cost of modification would be negligible.



**Figure 14. Water outflow from the bottom of the pond.**

**Settling or Pollution Abatement Pond:**

A settling or pollution abatement pond is a necessary component for fish hatchery. The abatement pond can be used to settle the solid wastes of hatchery effluents before discharge into receiving streams. Also, it is necessary to sufficiently dilute the chemically treated wastewaters. Some of the coastal hatcheries do have settling/pollution abatement ponds and others are either using one or more ponds to treat wastes or mix wastewaters with normal effluents from the entire rearing systems to dilute the solids and chemically treated wastewaters, to comply with the permit limits (Table 56). This is a difficult struggle for hatcheries with no proper abatement pond. Due to inadequate dilution capability at few facilities use of necessary chemicals for egg and/or fish treatments is restricted and thus affecting fish health.

**Table 65. Status of pollution abatement ponds at coastal fish hatcheries.**

| Name of Hatchery        | Status (Yes/No)                           | Comment                                                                                                                                                                             |
|-------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alsea                   | Yes                                       | ok                                                                                                                                                                                  |
| Bandon                  | Yes                                       | Two ponds used for pollution abatement, but wastewaters don't flow to abatement by gravity. No land for new pond. Recommended for two sump pumps to pump wastes to abatement ponds. |
| Butte Falls             | No                                        | Recommended for a pond                                                                                                                                                              |
| Cedar Creek             | Yes                                       | ok                                                                                                                                                                                  |
| Elk River               | No                                        | Recommended for a pond                                                                                                                                                              |
| Nehalem                 | No                                        | Recommended for a pond                                                                                                                                                              |
| Rock Creek              | Yes                                       | ok                                                                                                                                                                                  |
| Salmon River            | Yes                                       | An earthen pond with no outlet. Recommended for modification to prevent seepage to underground.                                                                                     |
| Trask River Hatchery    | Two small ditches used as abatement pond. | Recommended for two enlarged abatement ponds to the two rearing sites.                                                                                                              |
| Trask Pond (Satellite)  | None                                      | Recommended for an abatement pond.                                                                                                                                                  |
| Tuffy Creek (Satellite) | None                                      | Recommended for an abatement pond.                                                                                                                                                  |

**NPDES Permit Compliance:**

The NPDES permits require that hatchery discharges shall not exceed the following limitations:

- Total Suspended Solids Daily Maximum: 10 mg/L (normal operations)
- Total Suspended Solids Monthly Average: 5 mg/L (normal operation)
- Total Suspended Solids Daily Maximum: 15 mg/L (cleaning operations)
- Settleable Solids (monthly average): 0.1 ml/L (normal operation)
- Settleable Solids Daily Maximum: 0.2 ml/L (cleaning operations)
- Temperature Daily Maximum: 77°F (normal and cleaning operations)
- pH range: 6.0 – 9.0 (normal and cleaning operations)
- Chemicals: Be sufficiently diluted as per instructions of product labeling.

The permits require that records of all monitoring data shall be retained for a period of three years from the date of sample, measurement or report. The past three years' water quality monitoring data indicated that there were no reportable violations of the NPDES permits at any of the state funded coastal fish hatcheries (Table 57).

**Table 66. NPDES permit violations at coastal hatcheries during the last three years.**

| Name of Hatchery | Number of NPDES Permit Violations |      |      |
|------------------|-----------------------------------|------|------|
|                  | 2007                              | 2008 | 2009 |
| Alsea            | none                              | none | none |
| Bandon           | none                              | none | none |
| Butte Falls      | none                              | none | none |
| Cedar Creek      | none                              | none | none |
| Elk River        | none                              | none | none |
| Nehalem          | none                              | none | none |
| Rock Creek       | none                              | none | none |
| Salmon River     | none                              | none | none |
| Trask River      | none                              | none | none |

Also, there were no violations of the NPDES permits in 2010 up to the time of writing this report. However, modifications to the existing pollution abatement ponds or settling ponds are necessary at few facilities to facilitate the dilution of chemically treated waste waters.

#### **3.1.1.1 Alsea Hatchery Water Quantity/Quality and NPDES Permit Compliance**

Water supply is gravity fed from the North Fork Alsea River. The Alsea facility water right is 47 cfs from the North Fork of the Alsea River. Low flows and low dissolved oxygen levels (as low as 4.5 ppm) occur in late summer; however, program goals can be met under these conditions.

Some of the rearing ponds have rough floors which make pond cleaning operations difficult; and accumulation/deposition of uneaten feed and fecal wastes on rough floors may contribute to the proliferation pathogens.

Alsea Hatchery has good water temperatures even in summer months (Figure 11), and uses low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13).

In rearing ponds, water is supplied at the surface of pond and discharged from the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations, through self cleaning of ponds to some extent (see Figure 14).

The facility has a large pollution abatement pond and can sufficiently dilute the chemically-treated wastewaters. It complies with the NPDES permit water quality standards. There were no violations of the NPDES permit during the last three years.

#### Recommendations:

- The ponds with rough floors be coated to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Spawning wastes e.g. eggs be captured through a filter and disposed of as solid wastes and liquid wastes (blood, ovarian fluids, and waste waters) be diverted to sand/gravel/soil filtration system or to septic system.
- Modification to the water discharge system is recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

#### **3.1.1.2 Bandon Hatchery Water Quantity/Quality and NPDES Permit Compliance**

The hatchery's water rights are a combined 3.0 cfs from Ferry and Geiger Creeks. These two rights are senior to all other water rights on Ferry and Geiger Creeks. Water supply is gravity fed from reservoirs on Ferry and Geiger Creeks. Low flows occur during the late summer and early fall. Hatchery production and operation has been modified to fit this limiting factor. The City of Bandon shares the water supply and cranberry farmers pump from both above and below the hatchery. The City of Bandon funded and constructed a new intake that takes all domestic raw water from below the hatchery. As a result of the new City intake and coordination that occurs with cranberry growers, usable water for Bandon Hatchery is considerably more during the low flow period in the fall. Despite the low flows that occur each fall, water quality remains excellent.

Bandon Hatchery has low water temperatures even in summer months (Figure 11). The mean year round temperature for the same period is 51.4 degrees. Rarely does the water temperature reach 60 degrees in the summer, or drop below 40 degrees in the winter. The facility uses very low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13).

In rearing ponds, water is supplied at the surface of pond (except pond #9 which has a baffle system) and effluents are discharged from the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations, through self cleaning of ponds to some extent (see Figure 14).

There are seven rearing ponds and one adult holding pond in use at Bandon Hatchery. The pond bottom surface is medium rough. The ODFW hatchery personnel and Engineers have assessed the hatchery grounds, and found no suitable site for a pollution abatement pond. Therefore, ponds #5 and #8 have served as abatement ponds, although originally not designed for pollution abatement. Over time, rearing practices have been adjusted and with proper selection of fish feed and rearing strategies, the hatchery meets all permit parameters.

The biggest challenge for Bandon hatchery is to comply with the dilution requirements for formalin and hydrogen peroxide-treated chemical wastes, although these two chemicals are used very rarely in outside rearing ponds. Also, the abatement ponds (#5 and #8) do not receive all cleaning effluents by gravity. Therefore, provisions for two submerged pumps and underground vacuum lines for pumping of pond cleaning and chemically treated wastewaters from rearing ponds to the abatement ponds are necessary.

Bandon Hatchery is in compliance with the NPDES permit and no violations of the permit were observed during the last three years.

Recommendations:

- Provide provisions for two submerged pumps and underground vacuum lines to pump pond cleaning and chemically treated wastewaters from rearing ponds to abatement ponds.
- Ponds with rough floors be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Spawning wastes e.g. eggs be captured through a filter and disposed of as solid wastes, and liquid wastes (blood, ovarian fluids, and waste waters) be diverted to sand/gravel/soil filtration system or to septic system.
- Modification to the water discharge system is recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

**3.1.1.3 Butte Falls Hatchery Water Quantity/Quality and NPDES Permit Compliance**

The Butte Falls Hatchery water supply is gravity fed from the south fork of Big Butte Creek. Water quantity is very consistent even during the driest years. Summer temperatures (Figure 11) and dissolved oxygen levels are generally not a problem because sufficient water flows exist during the summer and early fall. The facility uses low quantity of chemicals and drugs to produce each pound of fish at this facility (Figures 12 and 13).

Some of the rearing ponds have rough floors and cracks which make pond cleaning operations difficult; and accumulation/deposition of uneaten feed and fecal wastes on rough floors may contribute to the proliferation pathogens.

Water is supplied at the surface of pond and discharged from the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations, due to self cleaning of ponds to some extent (see Figure 14).

There is no pollution abatement pond at Butte Falls Hatchery, although there were no NPDES permit violations during the last three years. To settle the solid wastes from pond cleaning operations and to sufficiently dilute chemically-treated wastewaters a pollution abatement pond is necessary. The facility design modifications for pollution abatement, in the form of settling ponds, have been designed, but funding for these modifications has not been obtained.

#### Recommendations:

- A settling or pollution abatement pond be constructed to comply with the NPDES permit requirements.
- The ponds with rough floors and cracks be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Modification to the water discharge system is recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

#### **3.1.1.4 Cedar Creek Hatchery Water Quantity/Quality and NPDES Permit Compliance**

Water supply is gravity fed from Cedar Creek and can be supplemented with pumps in summer months from Three Rivers if needed. Low flows and low-dissolved oxygen levels can occur in late summer; however, program goals can be met under these conditions. Compared to other coastal hatcheries Cedar Creek Hatchery enjoys the coldest water in summer months (Figure 6), but it receives high levels of siltation due to natural slides, particularly during winter periods of heavy rain and high flow. Sediment sources from storm events are similar to all coastal hatcheries and have made it difficult to comply with the NPDES permit in the past.

Some of the rearing ponds at Cedar Creek have rough floors which make pond cleaning operations difficult; and accumulation/deposition of uneaten feed and fecal wastes on rough floors may contribute to the proliferation pathogens.

In rearing ponds, water is supplied at the surface of pond and discharged from the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations, due to self cleaning of ponds to some extent (see Figure 149).

The facility has two pollution abatement ponds and there were no NPDES permit violations during the last three years. It uses very low to low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13), and can sufficiently dilute all chemically-treated wastewaters.

#### Recommendations:

- The ponds with rough floors be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Spawning wastes e.g. eggs be captured through a filter and disposed of as solid wastes, and liquid wastes (blood, ovarian fluids, and waste waters) be diverted to sand/gravel/soil filtration system or to septic system.
- Modification to the water discharge system recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

#### **3.1.1.5 Elk River Hatchery Water Quantity/Quality and NPDES Permit Compliance**

The supply water for Elk River Hatchery is pumped from the Elk River. Although low flows can occur in late summer of drought years, yet water supplies is more than sufficient and dissolved oxygen averages about 9.0+ ppm. Incubation or hatch house uses pathogen free ground water which naturally carries high dissolved oxygen and no additional oxygenation is required. Program goals are met easily, and supplementation and recirculation are never required. Elk River Hatchery effluents have the highest water temperature during summer months (Figure 6), which is a reflection of the ambient temperature of Elk River.

There were no NPDES permit violations during the last three years. The burrows type ponds at Elk River are to some extent are self cleaning. Despite the highest water temperature in summer months it uses low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13). Because of sufficient water in rearing ponds adequate dilution of chemically-treated wastewaters of a pond is successfully done through mixing with effluents from other ponds. There is no pollution abatement or settling pond at Elk River Hatchery. Necessary facility



design modifications for pollution abatement, in the form of raceway cleanouts, have been designed and funding for these modifications is necessary.

Recommendations:

- A settling or pollution abatement pond be constructed to comply with the NPDES permit requirements.
- A minor modification to the spawning building is necessary to capture the spawning wastes i.e., eggs be captured through a filter and disposed of as solid wastes, and liquid wastes (blood, ovarian fluids, and waste waters) be diverted to sand/gravel/soil filtration system or to septic system.
- Use fish feed that has better conversion ratio and minimize waste production.

**3.1.1.6 North Nehalem River Hatchery Water Quantity/Quality and NPDES Permit Compliance**

The water for North Nehalem Hatchery is 100 percent pumped from North Fork Nehalem River. Low flows and low dissolved oxygen levels occur in late summer; however, pumping reoxygenates the water. The water temperature at Nehalem Hatchery is relatively cold even in summer months (Figure 11). It has water rights of 23.52 cfs. Program goals can be met under these conditions.

In rearing ponds, supply water is added to the surface of ponds and discharged through the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance through self cleaning of ponds to some extent (see Figure 14).

Some of the rearing ponds have rough floors which make pond cleaning operations difficult; and accumulation/deposition of uneaten feed and fecal wastes on rough floors may contribute to the proliferation pathogens.

Nehalem Hatchery has no pollution abatement pond, which is necessary to divert pond cleaning wastes to settle and sufficiently dilute the chemically-treated wastewaters.

At Nehalem, spawning wastes are trapped and disposed of into the septic system. Also, the facility uses low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13). There were no NPDES permit violations at Nehalem Hatchery during the last three years.

Recommendations:

- A pollution abatement pond must be constructed at Nehalem hatchery.
- Ponds with rough floors be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.

- Modification to the water discharge system is recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

### **3.1.1.7 Rock Creek Hatchery Water Quantity/Quality and NPDES Permit Compliance**

Water supply is gravity fed from Rock Creek during winter/spring on a 30 cfs water right and North Umpqua pumps in the summer/fall on a 25 cfs water right. High temperatures (occasionally 70 plus degrees Fahrenheit) occur in summer months (Figure 6) and large winter freshets, and virulent pathogen loads present challenging conditions; however, most program goals can be met under these conditions. North Umpqua and Rock Creek supply abundant amounts of water for single pass fish rearing. There is enough water in early summer for 24-hour flushing with hyper flows in steelhead raceways to control *Ichthyophthirius* (Ich) during the pathogens most virulent conditions, in most cases in lieu of formalin. Highest densities per gpm rearing flow occur in the fall with 7,200 gpm available for 60,000 pounds of fish, equating to 8.5 pounds of fish per gpm. Temperatures in the summer are high but manageable for fish rearing. Ponding options for the 15 concrete raceways, brood pens, and Canadian troughs are very flexible and have accommodated many production scenarios up to this point. R9-R15 can be divided bringing the total to 22 concrete rearing pens. The total rearing space for this facility is 150,000 cubic feet. Current annual production equals 124,575 pounds of fish reared. Densities are at 0.83 pounds of fish per cubic foot rearing space at release.

The Rock Creek Hatchery has very high water temperature (Figure 11), and uses the highest quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13), suggesting higher occurrence of diseases and parasitic infestation. Some of the rearing ponds have rough floors which make pond cleaning operations difficult; and accumulation/deposition of uneaten feed and fecal wastes on rough floors may contribute to the proliferation pathogens.

In rearing ponds, water is supplied at the surface of pond and discharged from the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance during cleaning operations, through self cleaning of ponds to some extent (see Figure 14).

The facility has a pollution abatement pond and can sufficiently dilute the chemically-treated wastewaters. There were no NPDES permit violations during the last three years.

#### Recommendations:

- All ponds with rough floors be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Modification to the water discharge system is recommended (see Figure 14).

- Minor modification to the spawning building to filter out solid wastes (eggs) for disposal, and the liquid wastes (blood, ovarian fluid, and wastewater) be diverted to sand/gravel/soil filtration system or to septic system.
- The two side by side located outfalls for normal and cleaning operations be combined to form a single outfall for better dilution of cleaning and chemically treated wastewaters.
- Use fish feed that has better conversion ratio and minimize waste production.

### **3.1.1.8 Salmon River Hatchery Water Quantity/Quality and NPDES Permit Compliance**

Water supply is 100 percent pumped from the Salmon River. Low flows and low dissolved oxygen levels occur in late summer; however, pumping reoxygenates the water. Program goals can be met under these conditions.

The Salmon River Hatchery has high water temperatures during summer months (Figure 11); yet it uses low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13).

In rearing ponds, supply water is added to the surface of ponds and discharged through the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance through self cleaning of ponds to some extent (see Figure 14).

The pond bottoms are gradually becoming rough with age, which deserve attention for proper maintenance. The hatchery has a pollution abatement pond where pond cleaning and chemically treated wastewaters are pumped for settling and dilutions, respectively. The abatement pond has no outlet; consequently, the chemically treated wastewaters may seepage and contaminate the ground water. It is necessary that the abatement pond be enlarged and modified with asphalt floor bottom so that chemically treated wastewaters are sufficiently diluted before discharge.

Spawning females are bled into totes and wastes are dumped for disposal. The facility is operated in compliance with NPDES permit requirements; and there were no violations of the NPDES permit during the last three years.

#### **Recommendations:**

- The abatement pond be enlarged and modified with asphalt bottom and outlet pipe so that chemically treated wastewaters can be discharged after dilution and do not contaminate ground water through seepage.

- Ponds with rough floors be plastered to make them smooth to prevent trapping of wastes on pond bottom which will make pond cleaning easy, minimize growth of disease agents and chemical use.
- Modification to the water discharge system is recommended (see Figure 9).
- Use fish feed that has better conversion ratio and minimize waste production.

### **3.1.1.9 Trask River Hatchery Water Quantity/Quality and NPDES Permit Compliance**

Trask Hatchery has two sources of gravity fed water supply: Gold Creek and Mary's Creek. The water rights are for 9 cfs from Gold Creek and 1 cfs from Mary's Creek. Mary's Creek flow is used for egg incubation. Trask Hatchery has cold water temperatures even in summer months (Figure 11). There are also water rights of 9 cfs from the Trask River, which can be used in the summer, if needed. But it no longer pumps from the Trask River because of disease concerns. Sediment loads are manageable due to improving habitat in the watershed. Low flows and low dissolved oxygen levels occur in late summer; however, program goals can be met under these conditions.

In rearing ponds, supply water is added to the surface of ponds and discharged through the surface of pond's tail end over dam boards, which doesn't create water current at the pond bottom level. A simple modification to the water discharge system may help maintain good water qualities for fish health and NPDES permit compliance through self cleaning of ponds to some extent (see Figure 14).

The upper 8 rearing ponds at Trask Hatchery are very old and do not have slope on pond bottoms. Also, the floors are rough which trap solid wastes (uneaten food and fecal matter) and are difficult to clean. These eight ponds require modification. There is a small earthen pollution abatement pond below these eight ponds, which needs to be enlarged and modified with asphalt floor to treat chemically treated wastes.

The facility has another abatement pond below the lower two large rearing ponds but the volume is too small to dilute chemical wastes. Also, it has no asphalt floor. Consequently, the chemically treated wastes from this abatement pond may seepage and contaminate ground water. Modification to this abatement pond is necessary.

Trask Hatchery uses low quantity of chemicals and drugs to produce each pound of fish (Figures 12 and 13); and there were no NPDES permit violation at Trask Hatchery during the last three years.

Trask Pond is a satellite facility of Trask Hatchery, which produces around 7,000 lbs of fish per year and doesn't require a NPDES permit to operate. It is being operated using Best Management Practices to ensure it meets water quality standards. Trask Pond facility has abundant water of good quality. It has a small earthen abatement pond and in the past very little chemicals have been used at this facility.

Tuffy Creek is another satellite facility of Trask Hatchery and is operated using Best Management Practices to ensure it meets water quality standards. It produces about 14,000 lbs of fish per year. It has abundant water of good quality. Tuffy Creek facility has no pollution abatement pond and therefore a pollution abatement pond is desirable at this facility.

#### Recommendations:

##### *Trask Hatchery:*

- The upper 8 ponds with rough floors be plastered to make them smooth, and the pond floors be improved to have sufficient slope for easy cleaning and discharge of wastewaters.
- Both upper and lower abatement ponds be enlarged to increase volume, to sufficiently dilute the chemically-treated wastewaters.
- Spawning wastes e.g. eggs be captured through a filter and disposed of as solid wastes, and liquid wastes (blood, ovarian fluids, and waste waters) be diverted to sand/gravel/soil filtration system or to septic system.
- Modification to the water discharge system is recommended (see Figure 14).
- Use fish feed that has better conversion ratio and minimize waste production.

##### *Trask Pond:*

- The pollution abatement pond be enlarged.

##### *Tuffy Creek:*

- A pollution abatement pond be constructed.

### **3.1.2 Fish Health**

#### **3.1.2.1 Review:**

Fish health issues at ODFW coastal hatcheries are generally driven by the type and quality of the water supply and by the presence of adult anadromous or resident fish. In the majority of cases, pathogen presence and possible subsequent outbreaks in hatchery populations originate from fish in the facility's water supply. Fish in hatcheries with surface water supplies that harbor anadromous and/or resident fish are generally more prone to disease outbreaks, especially as water quantity and quality decrease and temperature increases in the summer and early fall months. Holding brood fish at a facility creates special requirements. In the case of anadromous adults, injections of antibiotics and multiple treatments for external fungus control may be required. Facilities that rear several salmonid species encounter more organism and disease outbreaks due of the inherent variability of fish species and their sensitivity to a variety of pathogens.

Once parasitic, bacterial, and fungal diseases become established in a fish population, hatchery staff must attempt to control outbreaks with minimal loss in as short a period of time as possible. Water quality and quantity become very important in attempts to control specific pathogens. Increasing water temperatures and decreased flows where recirculation of water is necessary make treatments more difficult in many cases. The types of ponds used for rearing fish can create problems for control of certain parasites. On top of these difficulties, hatcheries must also adhere to fishery chemical label restrictions, Veterinary Feed Directives, extra label prescriptions, and to Oregon Department of Environmental Quality guidelines for effluent concentrations of discharged chemicals.

There are considerable benefits to having a clean water supply including healthier fish, reduced chemical use and reduced labor. There is some urgency in trying to reduce chemical use because of ever changing and stricter regulations on which and at what concentrations fisheries chemicals can be released in hatchery effluents.

### **3.1.2.2 General Recommendations:**

Coastal, as well as other hatcheries in the state should be progressing toward water supplies that are free of pathogens and capable of maintaining reasonable temperatures. In some cases this may mean the use of well water or treatment of surface water and water temperature control may also be necessary. Since freshets with muddy water events are common during the rainy season, water treatments performed by filtration and UV disinfection must be carried out on water that has been clarified through a settling pond in order for the system to be effective during these storm events. At a minimum, the highest quality water possible should be provided early rearing of fish when many of the species are the most susceptible to pathogens.

Building, enlarging or improving abatement ponds will allow the use of approved chemical treatments and allow us to meet effluent guidelines for these chemicals and thus cause no harm to receiving waters.

Continue to actively reduce our reliance on drugs and chemicals. While complete elimination of therapeutics will not be possible, reductions have been made and should continue to be made. Having water supplies that are free of pathogens and finding ways to improve holding conditions such as ponds that can be effectively cleaned would be helpful in this effort. While using therapeutants, we must continue to develop means to ensure that they are not improperly discharged into receiving waters.

Explore ways to hold adult brood fish which would require minimal treatments and under optimal conditions. One such possibility is the use of reuse system with built in water treatment.

### **3.1.2.3 Hatchery-Specific Recommendations:**

#### **3.1.2.3.1 Alsea Hatchery**

### **The following fish health issues exist at Alsea Hatchery**

- Surface water supply with limited numbers of passed adults; present water supply is limited and warm in summer and fall.
- Incubation and early rearing should be supplied with treated, pathogen and temperature controlled water.
- Wild adult steelhead are treated for fungus with hydrogen peroxide.
- IHN virus has been isolated from returning adult steelhead.
- CWD, trichodinids, *Ichthyophthirius* (Ich), bacterial gill disease and gill amoeba are major pathogens of concern. With the exception of Ich outbreaks are seldom a serious and pathogens are treatable with formalin, hydrogen peroxide, Chloramine-T and antibiotics.
- The hatchery has an abatement pond providing satisfactory chemical dilutions for current DEQ standards.
- Occasional high water leading to extreme siltation events

#### **Specific Recommendations:**

Develop a filtered and UV treated water supply for the hatch house and early rearing. Provide system for chilling/heating clean water. Providing clean water would reduce chemical use for control of ectoparasites to a minimum.

Eventually provide the entire hatchery with clean water.

#### **3.1.2.3.2 Bandon Hatchery**

### **The following fish health issues exist at Bandon Hatchery:**

- Surface water supply with no anadromous adults but with some resident salmonids and other fish species present.
- Adults are not treated for fungus, thus there is no chemical use for this purpose.
- No significant fish losses have occurred for many years.
- Chemical uses for parasite treatments are difficult to accomplish in outside ponds due to insufficient water for proper chemical dilution and the absence of an abatement pond.
- *Ichthyobodo* and CWD are annual disease problems while *Ichthyophthirius* (Ich) can cause loss on some years. *Ichthyobodo* and Ich are treatable with formalin but difficult to treat in outside ponds because of the inability to properly dilute chemicals. Flushing the ponds has recently successfully treated Ich. CWD is treatable with antibiotics.

#### **Specific Recommendations:**

Filtration and UV disinfection of incoming water would decrease incidence of ectoparasites and reduce or eliminate the need for treatments. This is critical since there is not sufficient water flow to meet present and future effluent standards for treatment chemicals in outside ponds. Treatment of incoming water could decrease the severity of CWD outbreaks as well.

An abatement pond would allow the facility to meet chemical dilution effluent standards when treatments are required.

One need at Bandon Hatchery that would facilitate disease/parasite treatment with formalin would be the acquisition of a large (6”), trailer-mounted water pump. With this, ponds infested with *Ichthyobodo* or other external pathogens could be treated with formalin, and the effluent pumped to an empty pond for dissipation of the chemical. Then, the facility could comply with DEQ permit standards. Bandon Hatchery cannot currently use formalin in outside ponds, and must use hydrogen peroxide instead. If standards tighten for peroxide, as is being discussed, it may be difficult for Bandon Hatchery to meet standards.

#### **3.1.2.3.3 Butte Falls Hatchery**

**The following fish health issues exist at Butte Falls Hatchery:**

- Use of surface water (Willow Lake) in late summer and early fall
- Anadromous adults, juveniles and resident fish are present in water supply.
- No adults held at the facility.
- No abatement pond.
- Gyros, trichodinids, and cold-water disease (CWD) are the main disease concerns. *Ichthyophthirius* (Ich) is occasionally a serious problem. Ich is treatable with formalin, while gyros and trichodinids are treatable with formalin or hydrogen peroxide. CWD is treatable with antibiotics.
- A recent major fish health issue has been due to outbreaks caused by IHN virus have seriously impacted the rearing programs over the last three years. The virus is believed to have originated in anadromous fish in the hatchery’s water source. There has been no virus detected for nearly 3 years.

#### **Specific Recommendations:**

The facility needs to be protected from incoming pathogens in the water, either with water treatment such as filtration and UV disinfection, or as has been discussed, extending the intake pipe to a point above where any resident or anadromous fish are present (basically to the source spring).

An abatement pond is needed to make chemical treatments/dilution easier to comply with DEQ regulations.

#### **3.1.2.3.4 Cedar Creek Hatchery**

**The following fish health issues exist at Cedar Creek Hatchery:**

- Surface water supply is limited. During summer and fall, the facility may require pumped water from Three Rivers when adult salmon are present and thus increase the further exposure to pathogens.



- Chemical use for fungus treatment of adult steelhead during the 9 plus month holding period.
- Trichodinids and *Ichthyophthirius* (Ich) are the main disease concerns and are treatable with hydrogen peroxide and formalin. Ich treatments require the use of portable pumps to comply with DEQ requirements.

#### **Specific Recommendations:**

Development of a spring or well water supply for the hatch house to reduce the silt problem in high water years. Water treatment (filtration and UV) for the rest of the hatchery would also be a major improvement for overall fish health quality as it would reduce treatments for fungus and parasite control. If future plans include releasing fish into habitat that supplies water to the hatchery, a water treatment system will be a necessity.

Phase one of abatement water diversion has been completed and this allows some individual ponds to be treated with therapeutants that can be adequately diluted as per EPA requirements before entering receiving waters. However, increasing the size of the effluent line and supplying a direct line from all ponds to the abatement pump would vastly improve the current system. This would allow for easier pond treatments and fish in all ponds could then be treated and enable the facility to meet dilution requirements. Increasing the capacity and dilution capability of the abatement system will be important in subsequent years as future regulations regarding the safe use of chemicals and therapeutants will limit the amount of these chemicals allowed in hatchery effluent.

Resurfacing of pond bottoms using contemporary materials would allow better cleaning, which would serve to decrease the environment conducive to problematic parasites and fungal growth. Reduction of fungus and parasites would reduce the treatments necessary to control these health problems.

#### **3.1.2.3.5 Elk River Hatchery**

**The following fish health issues exist at Elk River Hatchery:**

- Surface water supply has anadromous adults, juveniles and resident salmonids present.
- Chetco adult fall Chinook and winter steelhead are treated for fungus with hydrogen peroxide. Elk River adult fall Chinook not treated for fungus.
- IHN virus has been isolated at this facility in the past and in some cases created high loss events but it has not been detected for many years. Gill amoeba, *Ichthyophthirius* (Ich), CWD and furunculosis are the major pathogens of concern. Gill amoeba is treatable with hydrogen peroxide. Ich is currently treated with hydrogen peroxide. Furunculosis and CWD are treatable with antibiotics.

#### **Specific Recommendations:**

Incoming water source needs to be protected from incoming pathogens with filtration and UV disinfection to increase fish health and decrease chemical use and discharge into the environment.

Build an abatement pond to improve ability to treat fish when needed and comply with effluent dilution regulations.

#### **3.1.2.3.6 North Nehalem River Hatchery**

**The following fish health issues exist at North Nehalem River Hatchery:**

- Surface water supply is limited and has large numbers of anadromous adult fish present as well as resident fish.
- No chemical use for fungus treatment since adults are not treated.
- Trichodinids, *Gyrodactylus* and *Ichthyophthirius* (Ich) are the primary ectoparasites detected. All are treatable with formalin.
- CWD and *furunculosis* are the main bacterial disease concerns and are treatable with antibiotics.
- During low flows, which typically occur during warm water temperatures, water recirculation is required for adequate water flow. This increases exposure to ectoparasites and more frequent treatments.

#### **Specific Recommendations:**

A clean and cool water source is essential for fish health; treatment of the water source with filtration and UV disinfection would reduce the need for treatment chemicals and increase the level of fish health.

#### **3.1.2.3.7 Rock Creek Hatchery**

**The following fish health issues exist at Rock Creek Hatchery:**

- Surface water supply with anadromous adults and juveniles present. High water temperatures in Rock Creek during the summer months necessitate pumping cooler water from the North Umpqua River during that time.
- Egg incubation and early rearing provided from an out of date filtration and disinfection system.
- Extremely high water temperatures even in water pumped from the Umpqua.
- Severe siltation problems during high water events.
- Adult fish held all months of the year are treated for fungus and for *Ichthyophthirius* (Ich) during summer months when temperatures are extremely high.
- Ich, columnaris, CWD, and fungus are the main disease concerns. Ich is treatable with formalin, columnaris and CWD with antibiotics.
- Abatement system currently provides adequate dilution for chemicals used at the hatchery
- Ponds are old and need to be lined or resurfaced to increase efficiency of treatments and help reduce Ich.

**Specific Recommendations:**

Rock Creek Hatchery needs a clean temperature controlled water supply. Filtration and UV treatment in the hatch house and early rearing troughs has proven invaluable. However, the system needs to be updated and should include temperature control.

The entire hatchery needs to have pathogen-free water. This would reduce chemical use tremendously.

Ponds at the hatchery need to be re-built or re-lined to provide smooth surfaces for more efficient flushing and cleaning.

### **3.1.2.3.8 Salmon River Hatchery**

**The following fish health issues exist at Salmon River Hatchery:**

- Surface water supply with many anadromous adult and juvenile fish present.
- There is no chemical use for fungus treatment since adults are untreated.
- CWD, *furunculosis*, *Ichthyophthirius* (Ich), gill amoeba, trichodinids, and coho anemia disease (CAD) are the main disease concerns. CWD and *furunculosis* are treatable with antibiotics; Ich is treatable with formalin, and gill amoeba with formalin or hydrogen peroxide.
- Resident and anadromous fish in the present water supply has lead to several disease issues, some severe at times.

**Specific Recommendations:**

Develop a clean water supply to the hatchery, or filtration and UV treatment for current water supply. A clean or treated water supply would diminish the necessity to treat raceways or ponds with chemicals and therapeutants.

Increase abatement capacity to meet required chemical dilution standards. At this time it is possible to meet dilution requirements in the raceways onsite, however the larger asphalt ponds (9 and 10) are difficult to treat and maintain current dilution requirements. This situation could be alleviated by the expansion of the abatement pond and increasing the size of the effluent pipe from the abatement pump to the abatement pond itself. Because environmental concerns and dilution requirements will likely become more restrictive in the future, it will be imperative to have adequate treatment abatement to meet set standards when the need to use chemicals and therapeutants occurs.

Leakage between some of the raceways is an ongoing problem. A permanent fix to these leaks, as well as resurfacing the raceway bottoms would greatly reduce the occurrence and spread of pathogens and subsequent disease problems.

### **3.1.2.3.9 Trask River Hatchery Complex**

**The following pathology issues exist at Trask Hatchery facilities:**

### **Trask Hatchery**

- Trask River water supply has many adult anadromous fish present. Fish will contract *columnaris*, *furunculosis*, *Ichthyophthirius* (Ich), and *Dermocystidium* in this water supply. Therefore, water supply use is limited to Gold Creek, which has no adults above the intake dam.
- Formalin is used for fungus treatments only on adult winter steelhead as per label instructions and meets dilution requirements.
- CWD, low-level furunculosis, *Ichthyophthirius* (Ich) and trichodinids are main disease concerns. CWD and furunculosis are treatable with antibiotics. Ich is treated with formalin and trichodinids with formalin or hydrogen peroxide.

### **Specific Recommendations:**

Recent improvements to the hatchery have increased early rearing capacity with a new building. This has improved the health of early rearing fish. Treatment of incoming water with filtration and UV would decrease need for chemical therapeutants.

### **Trask Pond**

- Water supply has many salmon and steelhead adults and juvenile fish present.
- In some years, spring Chinook juveniles must be treated for bacterial gill disease or gill amoeba with potassium permanganate, a chemical that currently is not directly regulated by the FDA. This treatment has not been necessary in recent years.
- In most years, fish are transferred out prior to developing disease problems.

### **Specific Recommendations:**

Treatment of incoming water with filtration and UV would decrease need for chemical therapeutants.

### **Tuffy Creek**

- Trichodinids have caused problems but are treatable with hydrogen peroxide.

### **Specific Recommendations:**

Treatment of incoming water with filtration and UV would decrease need for chemical therapeutants.

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## Appendices

### Appendix A. General Description of Coastal Hatcheries

#### A.1 Alsea Hatchery

Alsea Hatchery is located at river mile 48.5 on the North Fork Alsea River off Highway 34, 15 miles west of Philomath, Oregon. The site is at an elevation of 380 feet, at latitude 44° 25' 21" N (44.42278) and longitude 123° 33' 57" W (123.5514). The hatchery land area is 25 acres.

The hatchery water supply is from the North Fork Alsea River, located 2,300 feet upstream from the hatchery. The Alsea facility water right is 47 cfs. Water quality is good; however, low water flows are experienced during severe winter and summer conditions. Water temperatures range from 32°-73°F.

The facility is staffed with 4.0 FTE's.

**Table 67. Rearing facilities at Alsea Hatchery**

| Unit Type           | Unit Length (ft) | Unit Width (ft) | Unit Depth (ft) | Unit Volume (ft <sup>3</sup> ) | Number Units | Total Volume (ft <sup>3</sup> ) | Construction Material | Age  | Condition | Comment                                                 |
|---------------------|------------------|-----------------|-----------------|--------------------------------|--------------|---------------------------------|-----------------------|------|-----------|---------------------------------------------------------|
| Adult Holding Pond  | 200              | 16              | 2.5             | 8,000                          | 1            | 8,000                           | concrete              | 1938 | fair      |                                                         |
| Adult Holding Pond  | 75               | 16              | 6               | 7,200                          | 1            | 7,200                           | concrete              | 1974 | fair      | Divided into 10 pens and one main holding area          |
| Raceways            | 100              | 9               | 2.25            | 2,025                          | 10           | 20,250                          | concrete              | 1938 | poor      | not used - insufficient water                           |
| Raceways            | 100              | 20              | 4               | 8,000                          | 20           | 160,000                         | concrete              | 1974 | fair      | Pond 20 has reduced flow.                               |
| Circular Ponds      |                  | 29              | 3               | 430                            | 3            | 1,290                           | concrete              | 1938 | poor      | Pond 33 used for truck fill spout                       |
| Circular Tanks      |                  | 9               | 3               |                                | 4            |                                 | fiberglass            |      | good      | for holding wild steelhead brood                        |
| Canadian Troughs    | 16.5             | 3               | 2               | 99                             | 4            | 396                             | fiberglass            | 1994 | good      |                                                         |
| Deep Troughs        | 17.25            | 2               | 3               | 104                            | 25           | 2,588                           | concrete              | 1938 | fair      | 20 used for production, 5 used for egg/fry processing.  |
| Vertical Incubators |                  |                 |                 |                                | 168          |                                 |                       | 1984 | fair/poor | 24 stacks of 8 trays; top trays used for silt settling. |
| Abatement Pond      | 310              | 110             | 5               | 170,500                        | 1            | 170,500                         | asphalt               | 1974 | fair      |                                                         |

Hatchery buildings include the following: Residence#1 (02001), Residence#2 (02002), Residence#3 (02003), Residence#4 (02004), Garage Tank and Storage Building (02011/02018), Incubation Building (02013), Hatchery Office (02015), Cold Storage/Grinder Room (02016), Spawning Shed (02017), and Metal Storage Building (02019).

The Alsea Hatchery was originally constructed in 1936. A new alarm system was installed in 2001, and all rearing and incubation structures have alarms. The adult holding facilities do not have alarms. All structures utilized for rearing are in good



condition. Trap facilities include an adult holding pond with ladder and trap constructed in the mid-1970s. A smaller adult holding facility which includes four Canadian troughs is used for holding wild broodstock. Construction of an additional ladder and trap facility has been completed at the intake diversion dam. All trap facilities are in good condition.

The pollution abatement system includes a large asphalt pond and separate lines that allow for only pond cleaning effluent to be diverted to the pollution abatement pond. The system is more than adequate to meet DEQ permit requirements in relation to both hatchery effluent and chemical treatments.

The water delivery system is gravity flow and includes a diversion dam and intake structure. The intake structure was modified following the 1996 flood. The intake will require modification of the screens to meet NMFS recommendations.

The Alsea Hatchery facilities are used for adult collections, egg incubation, and rearing of rainbow trout and winter steelhead. The primary purpose of the facility is for sport fishery augmentation.

**Table 68. Annual production at Alsea Hatchery**

| <b>Species</b>   | <b>Stock</b>            | <b>Eggs for STEP</b> | <b>Legals/Trophy</b> | <b>Smolts</b> |
|------------------|-------------------------|----------------------|----------------------|---------------|
| Rainbow Trout    | Cape Cod (72)           | 0                    | 203,400              | 0             |
| Winter Steelhead | Siletz River wild (33W) | 0                    | 0                    | 50,000        |
| Winter Steelhead | Alsea River (43)        | 1,500                | 0                    | 80,000        |
| Winter Steelhead | Alsea River wild (43W)  | 0                    | 0                    | 60,000        |
| Totals           |                         | 1,500                | 203,400              | 190,000       |

Alsea Hatchery feeds approximately 240,000 pounds of feed per year. Most feeding is done by hand; some feeding is done with automatic feeders (bar feeders and Nielsen hopper feeders with spinners).

## A.2 Bandon Hatchery

Bandon Hatchery is located one mile east of the City of Bandon. The site is at an elevation of approximately 98 feet above sea level, at latitude 43° 06' 54" N (43.11611) and longitude 124° 23' 03" W (124.3992).

The hatchery water supply is obtained from two sources: Ferry Creek and Geiger Creek. Water from both sources is supplied by gravity. The hatchery's water rights are a combined 3.0 cfs from both creeks. Water temperatures range from 40°-65°F.

The facility is staffed with 3.0 FTE's.

**Table 69. Rearing facilities at Bandon Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |      |           |  |                                                |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|------|-----------|--|------------------------------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age  | Condition |  | Comment                                        |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |      |           |  |                                                |
| Adult Holding Pond  | 80     | 20    | 3.25  | 5200               | 1      | 5200               | concrete     | 1950 | poor      |  | spawning building built over first 20' of pond |
| Raceway             | 120    | 20    | 3.5   | 8400               | 1      | 8400               | concrete     | 1950 | fair      |  |                                                |
| Raceway             | 110    | 20    | 3.67  | 8074               | 1      | 8074               | concrete     | 1950 | fair      |  |                                                |
| Raceway             | 50     | 20    | 5.5   | 5500               | 1      | 5500               | concrete     | 1937 | poor      |  | used for settling pond for vacuum sludge       |
| Raceway             | 45     | 15    | 2.5   | 1688               | 1      | 1688               | concrete     | 1950 | good      |  |                                                |
| Raceway             | 100    | 20    | 3.5   | 7000               | 1      | 7000               | concrete     | 1950 | poor      |  | used as acclimation ponds                      |
| Raceways            | 100    | 20    | 3.5   | 7000               | 2      | 14000              | concrete     | 1958 | good      |  |                                                |
| Troughs             | 16     | 3.2   | 2     | 102                | 2      | 205                | concrete     | 1958 | fair      |  |                                                |
| Troughs             | 18     | 2.5   | 1.25  | 56                 | 2      | 113                | fiberglass   | 1985 | good      |  |                                                |
| Troughs             | 16     | 2.5   | 1.33  | 53                 | 4      | 213                | fiberglass   | 1991 | good      |  |                                                |
| Vertical incubators |        |       |       |                    | 16     |                    |              | 1984 | good      |  | 2 stacks of 8 trays, used for isolation system |
| Vertical incubators |        |       |       |                    | 448    |                    |              | 2003 | excellent |  | 28 stacks of 16 trays                          |

Bandon Hatchery currently has egg isolation capabilities, incubation water chilling capabilities, and capacity and reliability to complete all production goals.

With seven adult holding pens, multiple stocks and species of adults can be held at the same time and on short notice.

Hatchery buildings include the following: Residence #1 (06065), Residence 4 (06068), Spawning Shed (06070), Rearing Tank Building (06071), Cold Storage Building (06072), Incubation Building (06075), Shop Building (06077), Storage Building (06079).

Built in 1927, Bandon Hatchery has seen several changes in production strategies over the years. In the early years, cutthroat trout were the primary species reared. By the late 1970s, the emphasis was on anadromous fish. Because of limited water, large irrigation pumps recycled a high percentage of the water. This led to disease

problems as well as high power bills. In 1979, the facility was leased to a private aquaculture company, which failed within about 3 years. ODFW resumed production in 1984 and is currently used for adult collection, egg incubation, and rearing of fall Chinook, coho, winter steelhead and rainbow trout. It serves as an integral facility for local STEP programs within the Coquille and Coos basins. Fish production in the 1970's was 20,000 pounds with two permanent and one seasonal employee. Current production is 35,000 pounds annually with three permanent, full time employees. Eyed egg incubation is about 3,400,000 annually.

Bandon Hatchery is comprised of three tracts of land totaling 32.7 acres:

Tract A (15.4 acres) was purchased in 1924 for \$1 and has a reversion to heirs' clause if not used for fish culture for a period of two years. This creek section includes the hatchery building, fish weir and ladder, two residences, three other work buildings, all ten fish ponds, and the dam and intake for Geiger Creek Reservoir (the rest of the reservoir is on adjacent City of Bandon property). The condition of the rearing ponds ranges from very good to poor, with all ponds being functional. Tract B (6.7 acres) was purchased in 1926. This upper parcel contains one residence, feed building, shop, and two storage garages. Tract C (10 acres) was purchased in 1960. This is the location of the Ferry Creek Reservoir. The Department owns both Tracts B and C outright with no known reversion clauses.

Bandon Hatchery is very unique in that production poundage is lower than most facilities, but egg production, distribution and diversity is very high. Currently eight different lot numbers of fish and/or eggs are handled at Bandon Hatchery. In the past several years, the hatchery was integral in several short-term conservation programs. For example, Floras Creek coho were collected, spawned, and eggs incubated and transferred to a STEP hatchbox project for a three-year period. This program resulted in coho fry releases in sections of the stream determined to be suitable for supplementation. All hatchery programs in the Coos and Coquille drainages are dependent upon Bandon Hatchery. Past attempts at incubating eggs at various STEP facilities has not proved practical or cost effective. Additionally, the water supply at Bandon Hatchery is extremely reliable, and includes a state-of-the-art alarm system.

**Table 70. Annual production at Bandon Hatchery**

| <b>Species</b>   | <b>Stock</b>        | <b>Eggs</b>      | <b>Fingerlings</b> | <b>Smolts/Trophy</b> |
|------------------|---------------------|------------------|--------------------|----------------------|
| Fall Chinook     | Coos River (37)     | 1,750,000        | 552,500            | 0                    |
| Fall Chinook     | Coquille River (44) | 309,000          | 0                  | 0                    |
| Coho             | Coos River (37)     | 50,000           | 0                  | 0                    |
| Coho             | Coquille River (44) | 40,000           | 0                  | 0                    |
| Rainbow Trout    | Cape Cod (72)       | 0                | 0                  | 2,800                |
| Winter Steelhead | Coos River (37)     | 221,000          | 0                  | 0                    |
| Winter Steelhead | Coquille River (44) | 50,000           | 0                  | 48,000               |
| Winter Steelhead | Ten Mile Lakes (88) | 30,000           | 0                  | 0                    |
| Winter Steelhead | South Umpqua (144)  | 20,000           | 0                  | 70,000               |
| <b>Totals</b>    |                     | <b>2,470,000</b> | <b>552,500</b>     | <b>120,800</b>       |

Bandon Hatchery feeds approximately 29,000 pounds of feed per year. Mechanical belt feeders are used for the inside rearing troughs. All feeding of the outside ponds is done by hand.

### A.3 Butte Falls Hatchery

Butte Falls Hatchery is located 35 miles northeast of Medford off Highway 62 on the Butte Falls Highway, one mile east of the town of Butte Falls. The site is approximately 2,500 feet above sea level, at latitude 42° 32' 15" N (42.5375) and longitude 122° 33' 11' W (122.5531). Total land area is 14.6 acres. The titles have been researched. One section of the hatchery totally 10.4 acres is free of and clear of any reversion clause. A reversion cause would apply on the 4.2 acres of the former federal portion of the hatchery site (described below) which includes the most of the houses and buildings.

The hatchery water is supplied by gravity flow (one of four state coastal hatcheries that do not require pumping) from an intake on Big Butte Creek, approximately 0.5 miles above the hatchery. The hatchery's water rights are 15.5 cfs from the South Fork of Big Butte Creek. Water temperatures range from 34°-67°F

Under normal operations the facility is staffed with 3.0 FTE's.

**Table 71. Rearing facilities at Butte Falls Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |      |           |                                             |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|------|-----------|---------------------------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age  | Condition | Comment                                     |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |      |           |                                             |
| Raceways            | 70     | 20    | 4     | 5,600              | 6      | 33,600             | Concrete     | 1954 | fair      |                                             |
| Raceways            | 100    | 9.5   | 3     | 2,850              | 5      | 14,250             | Concrete     | 2004 | excellent |                                             |
| Raceways            | 40     | 10    | 2.5   | 1,000              | 2      | 2,000              | Concrete     | 1929 | poor      |                                             |
| Raceways            | 100    | 10    | 2.5   | 2,500              | 6      | 15,000             | Concrete     | 1929 | poor      | 2 not usable, 2 usable for larger fish only |
| Circular Ponds      |        | 25    | 2     | 246                | 4      | 984                | Concrete     | 1929 | poor      | Not used for production                     |
| Troughs             | 16     | 2.5   | 1.5   | 60                 | 36     | 2,160              | Concrete     | 1944 | good      |                                             |
| Troughs             | 16     | 1.16  | 0.5   | 9                  | 20     | 186                | Aluminum     | 1987 | good      |                                             |
| Vertical incubators |        |       |       |                    | 104    |                    |              |      | fair      | 13 stacks of 8 trays each                   |
| Rearing Pond        | 100    | 100   | 6     |                    | 1      |                    | Earthen      | 1954 | fair      | not used for production                     |

Hatchery buildings include the following: Incubation Building (15014), Office Building (15028), Wood Shop (15034), Shop (15036), Storage Building (15037), Garage/Shop (15033), Cold Storage/Grinder Room (15038), Residence #1 (15111) and Garage (15039), Residence #2 (15112) and Storage (15029), Residence #4 (15113) and Garage/Shop (15055), and Residence #5 (15114).

Butte Falls Hatchery has been operated continuously at its present site since 1915. At that time, the Oregon Fish and Game Commission began rearing rainbow trout in earthen ponds using water from Big Butte Creek, which was diverted ½ mile upstream through a wooden flume. For this purpose, 10.4 acres of land were deeded to the State of Oregon by the Butte Falls Lumber Company. Water rights to 6,950 gpm from Big Butte Creek were established in 1923. In 1932, the U.S. Fish and Wildlife Service began construction of a hatchery on three acres of land adjacent

to the state hatchery and began producing spring Chinook salmon. The water supply, which was shared with the State, was upgraded with the construction of a concrete intake structure and wooden staved pipeline. An egg taking station with adult collection and holding facilities was established at the same time at McCloud, Oregon, near the mouth of Big Butte Creek on the Rogue River. Chinook eggs were collected there and then transported back to the hatchery for incubation, rearing, and release into Big Butte Creek. The U.S. Fish and Wildlife Service turned over operation of these facilities to the Oregon Game Commission in 1941. The State has operated these facilities since that time, raising both trout and salmon at varying production levels. Later, during the 1950s and '60s, the wooden pipeline was replaced with steel and additional concrete rearing ponds were constructed.

More recent investments in Butte Falls Hatchery have helped modernize the facility with funding from ODFW's Fish Restoration and Enhancement Program. In 2003 the intake structure was completely remodeled to comply with all screening and downstream migrant standards and requirements, making Butte Falls the lone coastal hatchery meeting passage and screening requirements at this time. That same year an old rearing pond #13 was completely rebuilt and divided to create five 9' X 100' rearing ponds. A new state of the art alarm system has been installed in 2002.

The overall condition of Butte Falls Hatchery structures, buildings and facilities ranges from poor to very good. Butte Falls Hatchery does require the construction of a settling pond in order to better meet new State and Federal water pollution control requirements. The new settling pond design is designed based on the most current technologies in pollution abatement, and is ready for construction. Approximately \$500,000 is needed for this project.

Under normal operations production consists of 100,000 fall Chinook salmon smolts, 192,500 coho salmon smolts, 402,500 fingerling rainbow trout, and 77,120 legal rainbow trout.

Butte Falls Hatchery is ready to resume full production in 2010 after an outbreak of infectious hematopoietic necrosis virus (IHNV) occurred at the hatchery in 2006. It is believed that wild adult fish carrying IHNV that swam above the hatchery intake caused the viral outbreak. The ODFW Fish Health Management Policy restricts the transfer or release of fish from hatcheries at which certain disease outbreaks have occurred until it can be shown that susceptible fish stocks at the facility have been free of the specific disease for three consecutive years. Under these restrictions, fish infected with IHNV may only be released into waters in which the pathogen is endemic.

Butte Falls Hatchery has been virus free for three consecutive years. Production during those years has been limited to small groups of rainbow trout kept on station to test for the presence of the virus.

At full production, Butte Falls Hatchery feeds approximately 53,000 pounds of feed per year. Belt feeders are used for starting fry; all other feeding is done by hand.

The hatchery has been funded 50% general fund and 50% other funds. Recently Butte Falls has been operating at a reduced capacity on other funds only. Beginning in 2007 Butte Falls Hatchery began operating as a satellite facility of Cole Rivers Hatchery. The manager of Cole M. Rivers Hatchery is also responsible for the management of Butte Falls Hatchery.

In 2003 an old earthen rearing pond was resurrected into a trout fishing pond suitable for children and individuals needing universal access. The pond has become an extremely popular facility with as many as 200 – 300 people fishing per day on weekends.

#### A.4 Cedar Creek Hatchery

Cedar Creek Hatchery is located 1.5 miles east of Hebo off Highway 22, adjacent to Three Rivers, a Nestucca River tributary. The site is approximately 43 feet above sea level, at latitude 45° 12' 57" N (45.21583) and longitude 123° 50' 43" W (123.8453). The site encompasses 35.33 acres; all titles have been researched and are free and clear of any reversion clauses.

Water source for the hatchery is by gravity from Cedar Creek and by pump from Three Rivers during low summer flows. Total current water rights are for 44.42 cfs from Cedar Creek and 6.20 cfs from Three Rivers. Water temperatures range from 35°-65°F

The facility is operated with 3 FTE's.

**Table 72. Rearing facilities at Cedar Creek Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |      |           |                                     |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|------|-----------|-------------------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age  | Condition | Comment                             |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |      |           |                                     |
| Adult Holding Ponds | 94     | 20    | 4.5   | 8,460              | 2      | 16,920             | concrete     | 1989 | excellent |                                     |
| Abatement           | 450    | 135   | 6     | 696,000            | 1      | 696,000            | asphalt      | 1984 | good      |                                     |
| Rearing Pond        | 280    | 80    | 4     | 87,000             | 1      | 87,000             | asphalt      | 1999 | good      |                                     |
| Rearing Pond        | 35     | 20    | 3     | 2,100              | 1      | 2,100              | concrete     | 1969 | fair      |                                     |
| Raceways            | 100    | 20    | 4     | 8,000              | 3      | 24,000             | concrete     | 1979 | good      |                                     |
| Raceways            | 100    | 20    | 5     | 10,000             | 1      | 10,000             | concrete     | 1974 | fair      |                                     |
| Raceways            | 100    | 20    | 4     | 8,000              | 2      | 16,000             | concrete     | 1989 | excellent | center wall w/ removable dividers   |
| Troughs             | 16     | 1.2   | 0.58  | 11                 | 12     | 134                | aluminum     | 1979 | good      |                                     |
| Troughs             | 14     | 3     | 2.5   | 105                | 4      | 420                | concrete     | 1974 | good      |                                     |
| Troughs             | 16     | 2.75  | 1.5   | 66                 | 4      | 264                | fiberglass   | 1999 | excellent |                                     |
| Troughs             | 16     | 3     | 2.25  | 108                | 4      | 432                | fiberglass   | 1999 | excellent |                                     |
| Vertical Incubators |        |       |       |                    | 240    |                    |              | 1984 | good      | 15 stacks of 16 trays               |
| Abatement Pond      |        |       |       | 8,000              |        |                    | concrete     | 1954 | fair      |                                     |
| Abatement Pond      |        |       |       | 24,624             |        |                    | concrete     | 1954 | fair      | Can also pump to large asphalt pond |

Hatchery buildings include the following: Utility Building (29229), Pole Barn #1 (29231), Pole Barn #2 (29233), Electrical Building (29238), Incubation Building (29239), Cold Storage/Office Building (29249), Garage/Shed/Shop (29255), Residence #1 (29273/29251), Residence #2 (29274/29242), Residence #3 (29275), Residence #4 (29276), Spawning Building (29221), and Mobile Home-Silvercrest (29277).

Cedar Creek Hatchery has been continuously operated on its present site since 1914. The hatchery site was purchased on August 5, 1925, for \$1,329, and was added to in 1951, 1958, 1969, 1972, and 1978. At current production levels, water quantity and quality are sustainable through the late summer months. The condition of the rearing facilities ranges from fair to good. Cedar Creek Hatchery has modified production in order to meet new state and federal water pollution control



requirements. There is a weir and adult collecting facilities on Three Rivers and a weir on Cedar Creek. A satellite facility—Rhoades Pond—is owned by ODFW and is currently leased to the Nestucca Anglers; it has been used continuously for several years. It is currently the site of a STEP fall Chinook rearing project. The hatchery has been funded 100 percent from the Other Funds (i.e. license fees).

**Table 73. Annual production at Cedar Creek Hatchery**

| <b>Species</b>   | <b>Stock</b>         | <b>Eggs for STEP</b> | <b>Eggs for Salmon River</b> | <b>Fingerlings</b> | <b>Smolts/Legals+</b> |
|------------------|----------------------|----------------------|------------------------------|--------------------|-----------------------|
| Fall Chinook     | Nestucca River (47)  | 50,000               | 0                            | 105,000            | 0*                    |
| Spring Chinook   | Nestucca River (47)  | 65,000               | 0                            | 0                  | 110,000               |
| Summer Steelhead | Siletz River (33)    | 0                    | 120,000**                    | 0                  | 54,000**              |
| Summer Steelhead | Nestucca River (47)  | 0***                 | 0                            | 0                  | 100,000               |
| Winter Steelhead | Nestucca River (47)  | 2,000                | 0                            | 85,000             | 40,000                |
| Winter Steelhead | Nestucca River (47W) | 0                    | 0                            | 0                  | 70,000                |
| Rainbow Trout    | Cape Cod (72)        | 0                    | 0                            | 0                  | 600****               |
| <b>Totals</b>    |                      | <b>117,000</b>       | <b>120,000</b>               | <b>190,000</b>     | <b>374,600</b>        |

\*Fingerlings provided to Rhoades Pond STEP for eventual smolt release in Three Rivers/Nestucca River

\*\* 54 K go to Cedar Creek Hatchery to mix with 47 stock, 120K go to Salmon River for Siletz StS program.

\*\*\*May use StS eggs for STEP if StW not available

\*\*\*\*Trophy trout for various special events and Free Fishing Weekend

Cedar Creek Hatchery feeds approximately 41,600 pounds of feed per year. The majority of the feeding is done by hand, but small automatic feeders are utilized during early rearing in the hatch house starter tanks before the fish are transferred to outside raceways. In some cases, the auto-feeders are used as a supplement to hand feeding after transfer.

## A.5 Elk River Hatchery

Elk River Hatchery is located 7.5 miles upriver from Highway 101 just north and east of the City of Port Orford. Site is at an elevation of approximately 108 feet above sea level, at latitude 42° 44' 20" N (42.73889) and longitude 124° 24' 10" W (124.4028). The hatchery area is 13.2 acres; all titles have been researched and are free and clear of any reversion clauses.

Incubation water supply is pumped from a sub-surface well with a 7.5 horsepower line-shaft turbine pump. Four, 40 hp line-shaft turbine pumps through a screened intake pump the entire hatchery rearing water supply from Elk River. Water rights are for 20.015 cfs. Water temperatures range from 39°-74°F

The facility is staffed with 4 FTE's.

**Table 74. Rearing facilities at Elk River Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |     |           |                          |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|-----|-----------|--------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age | Condition | Comment                  |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |     |           |                          |
| Raceways            | 75     | 17    | 3     | 3,825              | 24     | 91,800             | concrete     | 40  | Good      | modified Burroughs ponds |
| Circular Ponds      |        | 14    | 2.5   | 385                | 1      | 385                | fiberglass   | 25  | Good      |                          |
| Vertical Incubators |        |       |       |                    | 560    |                    |              |     | Fair      | 35 stacks of 16 trays    |

Hatchery buildings include the following: Service Building (08030), Incubation Building (08031), Electrical Building (08036), Generator Building (08047), three Residences (08072/08073/08074) with the same floor plan, and the Steelhead Building (08075).

Elk River Fish Hatchery has been operated continuously on its present site since 1968. The hatchery was constructed on 21.5 acres (including easements) of donated land and was expanded in 1971. Adult trap and holding facilities for Elk River fall Chinook salmon include a fish ladder, an alley-type trap and 10 separate holding pens. Two of the rearing ponds (epoxy coated and fenced) are used during winter months as adult holding ponds for Chetco River fall Chinook salmon. A stand-alone building supplied with pathogen free well water houses the polyurethane-coated adult holding ponds for Chetco River winter steelhead.

Considering the many improvements and upgrades since 1995, the overall condition of Elk River Hatchery structures, buildings, and facilities ranges from good to very good. Elk River Hatchery does not require upgrades to meet new state and federal water pollution control requirements. The hatchery has been funded 100 percent from the State's General Fund.

**Table 75. Annual production at Elk River Hatchery**

| <b>Species</b>      | <b>Stock</b>      | <b>Eggs for<br/>STEP</b> | <b>Unfed Fry</b> | <b>Fingerlings</b> | <b>Smolts/Legals<br/>+</b> |
|---------------------|-------------------|--------------------------|------------------|--------------------|----------------------------|
| Fall Chinook        | Elk River (35)    | 700                      | 200,000          | 0                  | 325,000                    |
| Fall Chinook        | Chetco River (96) | 1,500                    | 0                | 0                  | 150,000                    |
| Rainbow Trout       | Cape Cod (72)     | 0                        | 0                | 0                  | 7,000                      |
| Winter<br>Steelhead | Chetco River      | 600                      | 0                | 4,500              | 50,000                     |
| Totals              |                   | 2,800                    | 200,000          | 4,500              | 532,000                    |

Elk River Hatchery feeds approximately 35,000 pounds of feed per year; all feeding is done by hand.

## A.6 North Nehalem River Hatchery

The North Nehalem Hatchery is located on the North Fork Nehalem River 12 miles east of the town of Nehalem on Highway 53. The site is at an elevation of 160 feet, at latitude 45° 39' 41" N (45.8130) and longitude 123° 50' 20" W (123.7745). Total land area is 26.2 acres.

The hatchery water rights are 23.3 cfs pumped from the North Fork Nehalem River and 0.22 cfs gravity flow from Mile Post #8 spring, located across Highway 53 from the hatchery. North Fork Nehalem water temperatures range from 32° - 72° F; spring water temperatures range from 38° -53° F. Water quality is abundant from a single source. Ponding options and isolation ability are good, but some minor limits to flexibility exist.

The facility is staffed with 3.5 FTE's.

**Table 76. Rearing facilities at North Nehalem River Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit   | Number | Total  | Construction |      |           |                                 |
|---------------------|--------|-------|-------|--------|--------|--------|--------------|------|-----------|---------------------------------|
| Type                | Length | Width | Depth | Volume | Units  | Volume | Material     | Age  | Condition | Comment                         |
|                     | (ft)   | (ft)  | (ft)  | (ft³)  |        | (ft³)  |              |      |           |                                 |
| Adult Holding pond  | 50     | 26    | 3.2   | 3,328  | 1      | 3,328  | concrete     | 1966 | good      |                                 |
| Raceways            | 75     | 16    | 2.5   | 3,000  | 20     | 60,000 | concrete     | 1966 | fair      | 1 raceway holds the 6 Canadians |
| Troughs             | 21     | 2.6   | 1.66  | 91     | 6      | 544    | fiberglass   | 1988 | good      | Canadian troughs                |
| Trough              | 16     | 1.2   | 0.5   | 10     | 1      | 10     | aluminum     |      | good      | picking trough                  |
| Circular Tanks      |        | 6     | 1.5   | 52     | 3      | 156    | fiberglass   |      |           |                                 |
| Vertical Incubators |        |       |       |        | 255    |        | fiberglass   |      | poor      | 17 stacks of 15 trays           |

Hatchery buildings include the following: Residences #1 - #4 (04056, 04057, 04058, and 04059), Pole Building (04060), Service Building (04070), Shop/Storage Building (04072), and Restroom Building (04088).

The Nehalem Hatchery has been continuously operated on its present site since 1966. The Hatchery was constructed in 1966, and replaced the old Nehalem Hatchery which was constructed in 1925 and located on Foley Creek, a tributary of the mainstem Nehalem River near the head of tidewater. Egg incubation and early rearing is accomplished by using pathogen-free water when available, which is diverted from a spring that is located across Highway 53 from the hatchery. The condition of the rearing facility is good with the exception of settling which is affecting some of the raceways and one building.

In 1992, an angling platform was constructed at the hatchery to provide access for disabled anglers. This one-of-a-kind platform produces a high-harvest rate on surplus hatchery fish, by members of the disabled angling community. This is a popular facility, and was expanded to twice its original size in 2004. As of November 1, 2002, Trask River Hatchery became a satellite facility of Nehalem Hatchery. The manager of Nehalem Hatchery is also responsible for the management of Trask River Hatchery and its associated satellite facilities.

**Table 77. Annual production at North Nehalem River Hatchery**

| <b>Species</b>   | <b>Stock</b>                              | <b>Fingerlings</b> | <b>Smolts</b> | <b>Legals/Trophy</b> |
|------------------|-------------------------------------------|--------------------|---------------|----------------------|
| Fall Chinook     | Trask River (34)                          | 0                  | 25,000*       | 0                    |
| Coho             | NF Nehalem (32) /<br>Fishhawk Lake (99)** | 0                  | 100,000       | 0                    |
| Coho             | Trask River (34)                          | 0                  | 100,000***    | 0                    |
| Rainbow Trout    | Cape Cod (72)                             | 0                  | 0             | 83,950               |
| Winter Steelhead | NF Nehalem (32)                           | 0                  | 130,000       | 0                    |
| Totals           |                                           | 0                  | 355,000       | 83,950               |

\*Fingerlings transferred from Trask River Hatchery after marking.

\*\*Fishhawk Lake Stock 99 is reared every third year.

\*\*\*Adults collected and spawned at TRH. Reared at NNH, then transferred back to TRH for acclimation/release

Nehalem Hatchery feeds approximately 92,000 pounds of feed per year. Most feeding is done by hand; belt feeders are used for starting fry, and demand feeders are used for steelhead grow-out from September through April.

## A.7 Rock Creek Hatchery

Rock Creek Hatchery is located on the North Umpqua River, 23 miles east of Roseburg, just off Highway 138. The site is at an elevation of approximately 820 feet above sea level, at latitude 43° 20' 07" N (43.33528) and longitude 123° 00' 05" W (123.0014). Total land area is 26.5 acres.

The hatchery water supply is obtained from two sources: Rock Creek and the North Umpqua River. Water from Rock Creek is supplied by gravity; North Umpqua water is pumped during the summer months. Water rights are 30 cfs for Rock Creek and 25 cfs for the North Umpqua. Soda Springs adult pond is supplied from the North Umpqua at 4 cfs. Water temperatures range from 37°-70°F.

The facility is staffed with 5 FTE's.

**Table 78. Rearing facilities at Rock Creek Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction               |      |           |                       |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|----------------------------|------|-----------|-----------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material                   | Age  | Condition | Comment               |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |                            |      |           |                       |
| Holding Pond        | 135    | 26    | 3.5   | 12,285             | 1      | 12,285             | concrete                   | 1944 | good      |                       |
| Raceways            | 145    | 20    | 4     | 11,600             | 6      | 69,600             | concrete                   | 1944 | poor      |                       |
| Raceways            | 80     | 20    | 4.5   | 7,200              | 7      | 50,400             | concrete                   | 1979 | good      |                       |
| Raceways            | 80     | 30    | 4.5   | 10,800             | 2      | 21,600             | concrete                   | 1979 | good      |                       |
| Troughs             | 16     | 2     | 2     | 64                 | 5      | 320                | fiberglass                 | 1994 | good      |                       |
| Trough              | 16     | 2     | 3     | 96                 | 1      | 96                 | fiberglass                 | 2003 | new       |                       |
| Vertical Incubators |        |       |       |                    | 300    |                    |                            | 1994 | good      | 20 stacks of 15 trays |
| Abatement Pond      | 110    | 90    | 6     |                    | 1      |                    | concrete w/<br>dirt bottom | 1979 | good      |                       |

Hatchery buildings include the following: Residence (10091), Residence (10092), Residence (10093), Residence (10094), Residence (10095), Generator Building (10122), Garage Building (10126), Pumphouse (10130), and Incubation Building (10140).

Construction of the original hatchery began in 1920 near the mouth of Rock Creek. In 1925, the salmon hatchery moved to a new site across from the trout hatchery which closed in 1943. The hatchery operated continuously until 1975 when the hatchery was closed due to the facility's rearing problems related to summertime high temperatures and low flows in Rock Creek. The hatchery was reopened in 1979, after completion of \$1.8 million improvements that provided a new summertime water supply via a pump station in the North Umpqua River, new concrete raceways, an effluent settling basin, and expanded domestic sewage treatment facilities. In 1982, another raceway was constructed with funds from Douglas County as mitigation for wild coho impacts from Galesville Dam, located on upper Cow Creek, tributary of the South Umpqua. A new fishway and collection facility was constructed in 1989, to meet the objectives and tasks included in the North Umpqua Fish Management Plan adopted by the OFWC in 1986. Further housing

improvements and facility expansions, including much improved public road access and “host site”, were completed in 1991-92. The incubation facility was renovated in 1993 with a state-of-the-art water filtration system, ozone and UV sterilization system, water chillers, 20 stack incubators and five Canadian troughs. In 1997, a 245 kw emergency generator was installed as a backup system for the North Umpqua River pumping station. In 1998, the Rock Creek intake was completely reconstructed and the pumping station screens replaced to comply with current NMFS screening specifications. In 2004 the hatch house and raceways 9 through 15 were plumbed into the abatement pond to bring the hatcheries effluent into compliance with NPDES 300J permit regulations. The upgrade of the pumping station was completed in 2010.

**Table 79. Annual production at Rock Creek Hatchery**

| <b>Species</b>   | <b>Stock</b>      | <b>Eggs for STEP</b> | <b>Eggs for Pacificorp Research</b> | <b>Fingerlings</b> | <b>Smolts/ Legals+</b> |
|------------------|-------------------|----------------------|-------------------------------------|--------------------|------------------------|
| Fall Chinook     | Cow Creek (18)    | 350,000              | 0                                   | 0                  | 0                      |
| Fall Chinook     | Smith River (151) | 0                    | 0                                   | 0                  | 70,000                 |
| Spring Chinook   | Umpqua River (55) | 0                    | 0                                   | 0                  | 342,000                |
| Coho             | Cow Creek (18)    | 0                    | 0                                   | 0                  | 60,000                 |
| Coho             | Umpqua River (55) | 0                    | 80,000                              | 0                  | 0                      |
| Rainbow Trout    | Cape Cod (72)     | 0                    | 0                                   | 0                  | 57,600                 |
| Rainbow Trout    | Fish Creek (551)  | 0                    | 0                                   | 9,600              | 4,000                  |
| Summer Steelhead | Umpqua River (55) | 1,000                | 0                                   | 0                  | 110,000                |
| Winter Steelhead | Cow Creek (18)    | 2,000                | 0                                   | 0                  | 120,000                |
| Winter Steelhead | Umpqua River (55) | 0                    | 0                                   | 0                  | 60,000                 |
| <b>Totals</b>    |                   | <b>353,000</b>       | <b>80,000</b>                       | <b>9,600</b>       | <b>823,600</b>         |

The Umpqua Watershed is unique to Oregon as the only watershed to be encompassed by an entire county (Douglas) and the only coastal ESU watershed to cut through the Oregon Coast Range and drain the Cascade mountain range. Rock Creek Hatchery production provides diverse year-round fishing opportunities on over 285 river miles of the Umpqua River Basin.

Rock Creek Hatchery feeds approximately 142,500 pounds of feed per year. Belt feeders are used to feed fry in the Canadian troughs; all other feeding is done by hand.

## A.8 Salmon River Hatchery

Salmon River Hatchery is located seven miles north of Lincoln City off Highway 18 near Otis. Site is at an elevation of 30 feet above sea level, at latitude 45° 01' 02" N (45.02667) and longitude 123° 56' 11" W (123.9503). Site area is 23.67 acres; all titles have been researched and are free and clear of any reversion clauses.

The hatchery water supply is provided by five electric pumps on Salmon River. Water rights are for 30.03 cfs. Water temperatures range from 35°-73°F.

The facility is staffed with 3.3 FTE's.

**Table 80. Rearing facilities at Salmon River Hatchery**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |      |           |                                                                                                               |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|------|-----------|---------------------------------------------------------------------------------------------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age  | Condition | Comment                                                                                                       |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |      |           |                                                                                                               |
| Adult Holding Pond  | 88     | 31    | 4     | 10,912             | 1      | 10,912             | concrete     |      | fair      | Future plans include rebuilding entire adults collection/handling/ sorting/ spawning area.                    |
| Adult Holding Pond  | 88     | 31    | 3     | 8,184              | 1      | 8,184              | concrete     |      | fair      |                                                                                                               |
| Rearing Ponds       | 187    | 28    | 5     | 26,180             | 3      | 78,540             | asphalt      |      | fair      | Needs resealing and new valves                                                                                |
| Raceways            | 80     | 20    | 2.5   | 4,000              | 4      | 16,000             | concrete     | 1988 | fair      | Needs resealing and new valves                                                                                |
| Raceways            | 80     | 10    | 2.5   | 2,000              | 2      | 4,000              | concrete     | 1988 | fair      | Needs resealing and new valves                                                                                |
| Raceways            | 80     | 10    | 2.5   | 2,000              | 4      | 8,000              | concrete     | 1976 | fair      | Dividers between two ponds can be removed to make one 20'x80' pond. Needs new intake manifolds and new valves |
| Rearing Troughs     | 21     | 2.67  | 1.5   | 84                 | 2      | 168                | aluminum     | 1981 | good      |                                                                                                               |
| Vertical Incubators |        |       |       |                    | 256    |                    |              | 2003 | excellent | excellent                                                                                                     |
| Vertical Incubators |        |       |       |                    | 64     |                    |              | 1987 | fair      | fair                                                                                                          |
| Abatement Pond      |        |       |       |                    | 1      |                    | earthen      |      | fair      | Needs to be excavated                                                                                         |

Hatchery buildings include the following: Utility Building (21163), Residence #1(21208), Residence #2 (21209), Incubation Building (21210), Mobile Home "Camelot" (21215) and Manufactured Home "Fleetwood".

The Salmon River Hatchery was constructed in 1975, and has been in continuous operation since that time. The Hatchery has been funded 100 percent under the State General Fund, but is currently funded with 50% State General Fund and 50% Other Fund. The condition of the rearing facilities is generally good. Some work would be required to address current needs before the site could be classified as in "very good" operational status.



**Table 81. Annual production at Salmon River Hatchery**

| <b>Species</b>   | <b>Stock</b>      | <b>Fingerlings</b> | <b>Smolts</b> | <b>Legals/Trophy</b> |
|------------------|-------------------|--------------------|---------------|----------------------|
| Fall Chinook     | Salmon River (36) | 0                  | 200,000       | 0                    |
| Coho             | Big Creek (13)    | 200,000            | 0             | 0                    |
| Rainbow Trout    | Cape Cod (72)     | 0                  | 0             | 46,500               |
| Summer Steelhead | Siletz River (33) | 0                  | 80,000        | 0                    |
| Totals           |                   | 200,000            | 280,000       | 46,500               |

The hatchery also has supplied 50,000 fall Chinook to be acclimated and released at a site in the lower Yaquina Bay. The Yaquina Chinook program has been suspended however until such time as a suitable smolt release and adult recapture site on lower Yaquina Bay is secured.

Salmon River Hatchery feeds approximately 28,000 pounds of feed per year. The majority of feeding is done by hand. Belt feeders are used to feed fry in the Canadian troughs. A feed blower was used for feeding fish in the large asphalt rearing ponds; the equipment used to haul the feeder is worn out and needs replacing.

## A.9 Trask River Hatchery

Trask Hatchery is located on the Trask River eight miles east of Tillamook. The site encompasses 18.94 acres and is at an elevation of approximately 100 feet above sea level, at latitude 45° 25' 53" N (45.43139) and longitude 123° 43' 58" W (123.7328). All titles for Trask Hatchery have been researched and are free and clear of any reversion clauses. Trask Pond is located on the East Fork of the S. Fork Trask River, sixteen miles east of Tillamook on Trask River County Road. The site is at an elevation of approximately 420 feet, at latitude 45° 24' 42" N (45.41167) and longitude 123° 35' 45" W (123.5958). The site area is 32.88 acres. The Tuffy Creek facility is located approximately 22 miles east of Tillamook off Highway 6 at the South Fork Wilson River Forest Camp, and is operated in cooperation with the Oregon Department of Corrections.

The main hatchery water supply is obtained from two sources: Gold Creek, and Mary's Creek. The water right is for 9 cfs from Gold Creek and 1 cfs from Mary's Creek. Water temperatures range from 35°-64°F. There is also a water right of 9 cfs from the Trask River that is unusable when needed in the summer due to intake location. Trask Pond is supplied by water from the East Fork of the South Fork Trask River. The water right is for 29.755 cfs. Water temperatures range from 33°-64°F. Tuffy Creek is supplied by water from the South Fork Wilson River. The water right is for 3 cfs. Water temperatures range from 32°-61°F.

The facility is staffed with 4.25 FTE's.

**Table 82. Rearing facilities at Trask River Hatchery and satellite facilities**

| Unit                | Unit   | Unit  | Unit  | Unit               | Number | Total              | Construction |      |           |                           |
|---------------------|--------|-------|-------|--------------------|--------|--------------------|--------------|------|-----------|---------------------------|
| Type                | Length | Width | Depth | Volume             | Units  | Volume             | Material     | Age  | Condition | Comment                   |
|                     | (ft)   | (ft)  | (ft)  | (ft <sup>3</sup> ) |        | (ft <sup>3</sup> ) |              |      |           |                           |
| Adult Holding Pond  | 50     | 30    | 2.6   | 3,900              | 1      | 3,900              | concrete     |      | Fair      | Pond T-9 Trask Hatchery   |
| Adult Holding Pond  | 40     | 20    | 3.7   | 2,960              | 1      | 2,960              | concrete     |      | Fair      | Pond T-3 Trask Hatchery   |
| Rearing Pond        | 225    | 64    | 5     | 72,000             | 1      | 72,000             | butyl liner  | 2006 | good      | Trask Pond                |
| Rearing Pond        | 120    | 35    | 3.5   | 14,700             | 1      | 14,700             | asphalt      | 1988 | Good      | Tuffy Creek               |
| Raceways            | 100    | 30    | 3.5   | 10,500             | 2      | 21,000             | concrete     |      | Good      | Pond 1&2 Trask Hatchery   |
| Raceways            | 50     | 8     | 2.7   | 1,080              | 8      | 8,640              | concrete     |      | Fair      | Ponds 5-12 Trask Hatchery |
| Raceway             | 142    | 30    | 2.4   | 10,224             | 1      | 10,224             | concrete     |      | Fair      | Pond 13 Trask Hatchery    |
| Raceway             | 50     | 50    | 1.6   | 4,000              | 1      | 4,000              | concrete     |      | Fair      | Pond 14 Trask Hatchery    |
| Canadian Troughs    | 15     | 3     | 2.6   | 115                | 10     |                    | fiberglass   |      | Good      | CT-1-10 Trask Hatchery    |
| Troughs             | 15     | 1.2   | .6    | 10.8               | 4      | 43.2               | fiberglass   |      | Good      | Trask Hatchery            |
| Vertical Incubators |        |       |       |                    | 384    |                    | fiberglass   |      | poor      | Trask Hatchery            |
| Vertical Incubators |        |       |       |                    | 176    |                    | plastic      | 2008 | new       | Trask Hatchery            |
| Vertical Incubators |        |       |       |                    | 112    |                    |              |      | Good      | Tuffy Creek               |

Hatchery buildings include the following: Residence (29283), Residence (29284), Incubation Building (29290), Storage Building (29306), Freezer Building (29324)

and Spawning Shed (29330). A 24ft by 48ft early rearing building and a 40ft by 60 ft storage building / shop were added in 2007.

The Trask River Hatchery site was purchased on November 28, 1914, and was expanded in 1960, 1961, 1962, and 1976. The Trask River Hatchery has been continuously operated on its present sight since 1914. The East Fork Trask Pond (Trask Pond) began operations in 1971 as a satellite of Trask River Hatchery. Trask Pond is on property leased from the Oregon Department of Forestry (ODF). The Tuffy Creek satellite facility located at South Fork Prison Camp on the South Fork of the Wilson River was completed in 1989. Tuffy Creek operates under a Special Use Permit from ODF and is in partnership with ODF, Oregon Department of Corrections (ODC) and ODFW. In addition, Trask Hatchery supplies eyed eggs to the Whiskey Creek STEP facility (operated by Tillamook Anglers) and to STEP volunteers. The manager position at Trask was eliminated due to General Fund reductions; the facility is managed as a satellite of Nehalem Hatchery. The hatchery is funded 30.5 percent from the State's General Fund and 69.5 percent other funds.

**Table 83. Annual production at Trask River Hatchery**

| Species          | Stock                             | Eggs for STEP | Fingerlings | Smolts  |
|------------------|-----------------------------------|---------------|-------------|---------|
| Fall Chinook     | Trask River (34)                  | 280,000       | 26,000*     | 113,000 |
| Spring Chinook   | Trask River (34)                  | 156,000       | 183,000**   | 70,000  |
| Coho             | Trask River (34)                  | 20,000        | 140,000***  | 100,000 |
| Winter Steelhead | Wilson River (121F)<br>wild brood | 0             | 0           | 100,000 |
| Totals           |                                   | 456,000       | 349,000     | 383,000 |

\*Fingerlings transferred to North Nehalem Hatchery for rearing and release in Necanicum R.

\*\*Fish transferred to Tuffy Cr. Pond (63K) and EF Trask Pond (120K) for eventual smolt releases in Wilson and Trask rivers.

\*\*\*Fingerlings transferred to North Nehalem Hatchery for rearing, smolts transferred back for acclimation/release

**Table 84. Annual production at Trask Pond**

| Species        | Stock            | Eggs for STEP | Fingerlings | Smolts   |
|----------------|------------------|---------------|-------------|----------|
| Spring Chinook | Trask River (34) | 0             | 0           | 160,000* |
| Totals         |                  | 0             | 0           | 160,000  |

\*Includes 40K transferred in from Whiskey Cr. STEP and 120K from Trask River Hatchery

**Table 85. Annual production at Tuffy Creek**

| Species          | Stock            | Eggs for STEP | Fingerlings | Smolts  |
|------------------|------------------|---------------|-------------|---------|
| Spring Chinook   | Trask River (34) | 0             | 0           | 60,000  |
| Winter Steelhead | Trask River (34) | 0             | 0           | 80,000  |
| Totals           |                  | 0             | 0           | 140,000 |

Trask River Hatchery and its satellite facilities feed approximately 43,000 pounds of feed per year. Feeding at Trask River Hatchery is done by hand, except for belt feeders used to start fry. Three automatic feeders were purchased for use at Trask Pond for feeding on weekends, holidays and furlough days.

## **Appendix B. Fish Hatchery Management Policy**

### **635-007-0542**

#### **Purpose of the Hatchery Management Policy**

(1) The purpose of the Hatchery Management Policy is to describe the hatchery tool and its range of applications. The Hatchery Management Policy also provides general fish culture and facility guidelines and measures to maintain genetic resources of native fish populations spawned or reared in captivity. This policy applies to all Department hatchery operations and programs including Salmon and Trout Enhancement Program (STEP) fish propagation projects (OAR 635-009-0090 through 635-009-0240) and Cooperative Salmon Hatchery Programs (OAR 635-009-0400 through 635-009-0455).

(2) This policy describes best management practices that are intended to help ensure the conservation of both naturally produced native fish and hatchery produced fish in Oregon through the responsible use of hatcheries. The conservation of hatchery produced fish is important to maintain opportunities for fisheries and aid conservation of naturally produced native fish.

(3) The Hatchery Management Policy complements and supports the Native Fish Conservation Policy OAR 635-007-0502 through 635-007-0506 and will be implemented through conservation plans developed for individual species management units, hatchery program management plans, or other formal agreements with management partners. The Hatchery Management Policy provides a foundation for the management and reform of hatcheries in Oregon, whereas the Native Fish Conservation Policy establishes the process for defining the specific use of the hatchery tool in specific watersheds.

Stat. Auth.: ORS 496.012 and 496.138

Stats. Implemented: ORS 496.171, 496.172, 496.176, 496.182, 496.430, 496.435, 496.445, 496.450, and 496.455

Hist.: Adopted 5-9-03, ef. upon filing

### **635-007-0543**

#### **Hatchery Management Policy Goals**

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

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

(3) Maintain genetic resources of native fish populations spawned or reared in captivity.

(4) Minimize adverse ecological impacts to watersheds caused by hatchery facilities and operations.

## **635-007-0544**

### **Operating Principles for Hatchery Management**

(1) Hatchery management and reform will generally proceed from the following hatchery premise: The ideal hatchery removes as many random mortality effects as possible without having any other influence on the natural life or experience of native fish and their habitats. The hatchery premise has five main components that managers shall strive to incorporate into hatchery programs:

- (a) Removing random mortality occurring in the natural environment;
- (b) simulating selective mortality operating in the natural environment;
- (c) minimizing artificial selection;
- (d) providing fish rearing and training experiences to reduce unnatural behaviors; and
- (e) minimizing ecological impacts associated with hatchery operations (e.g., competition and predation associated with release location and number, pathogen transfer and amplification, pollutants, passage barriers, over harvest of weak stocks in mixed stock fisheries).

(2) Success moving toward the premise in subsection (1) will be largely dependent on funding, research, program type, and facility or operating flexibility.

(3) Hatchery program management plans shall be developed and implemented in consultation and cooperation with management partners and the public, and in coordination with native fish conservation policy plans at local and regional scales.

(4) Hatchery programs shall be managed to provide optimum fishery and conservation benefits, based on the best available scientific information. Most programs will contribute toward fish management objectives primarily by raising fish for harvest while minimizing the impact on, or benefiting, fish that spawn naturally.

(5) Hatchery facilities shall be operated to maximize fish quality and minimize adverse impacts to watersheds, consistent with fish management objectives, applicable permits and agreements.

(6) Monitoring and evaluation shall be adequate to measure progress toward fish management and hatchery program objectives, contain risks within acceptable limits, and provide feedback for adaptive management.

## **635-007-0545**

### **Hatchery Program Management Plans**

(1) The Department shall develop hatchery program management plans for all hatchery programs. Clear management objectives that describe the role and expectations for hatchery programs relative to species conservation, watershed health and fisheries shall be the foundation for all hatchery program management plans. A hatchery program management plan may be a Hatchery and Genetic Management Plan, a Lower Snake River Compensation Plan annual operating plan, an aspect of a conservation plan developed under the Native Fish Conservation Policy (OAR 635-007-0502 through -0506) or similar document which describes the program's objectives, fish culture operations, facilities operations, and monitoring and evaluation, as more fully detailed in subsections (2) through (24) of this rule.

#### **Planning and Coordination of Hatchery Programs**

(2) When developing hatchery program management plans, the Department shall use the most up to date and reliable scientific information and seek the input and involvement of appropriate tribal, state and federal management partners, university programs and the public.

(3) The Native Fish Conservation Policy (OAR 635-007-0502 through -0506) provides the primary process for planning and coordinating hatchery programs, but these programs shall also be coordinated with obligations arising in other forums (e.g., U.S. v. Oregon, Lower Snake River Compensation Plan, Pacific Salmon Treaty) to avoid inconsistency and duplication.

(4) Coordination objectives include:

(a) efficient use of resources (including sharing of facilities, staff, equipment and supplies);

(b) improved communication among managing entities to share information and experience, jointly resolve issues, and promote common objectives pursued at local and regional scales.

(5) Hatchery program management plans shall be submitted to and approved (or modified) by the Fish Division. The Fish Division may waive the requirement to include specific elements of a hatchery program management plan upon a determination that the requirement would provide no appreciable benefit to hatchery management or native fish conservation.

(6) The Department shall continue to operate a hatchery program according to existing statutes, administrative rules, Commission directives, and binding agreements until that program's plan is approved.

### **Hatchery Program Objectives and Types**

(7) Hatchery program objectives and types shall be based on fish management objectives established via conservation plans (OAR 635-007-0505) or other binding agreements. Until conservation plans or other agreements are in place, hatchery program objectives and types will be based on existing statutes, rules, Commission directives and current management direction.

(8) Hatchery program management plans shall include measurable criteria relating to the following general objectives:

- (a) conservation and/or fishery benefits;
- (b) a net survival advantage (egg to adult) over naturally produced fish;
- (c) minimal adverse interactions (e.g., competition, predation, genetic introgression, and disease amplification) of hatchery programs with naturally produced native fish populations;
- (d) minimal adverse effects (e.g., water quality and quantity, solid and chemical wastes and fish passage) of hatchery facility operations on watershed health and native fish populations; and
- (e) sustainability of hatchery programs over time.

(9) Department hatchery programs will generally be distinguished as harvest or conservation hatchery programs. A single hatchery may have both harvest and conservation hatchery programs. If harvest and conservation programs are not distinguished, the Department shall clarify harvest and conservation objectives and their relative priorities.

(10) Harvest hatchery programs operate to enhance or maintain fisheries without impairing naturally reproducing populations. Operations shall integrate hatchery and natural production systems (e.g., locally-derived hatchery broodstocks, rearing containers simulating natural characteristics) if necessary for conservation, within funding and facility constraints and consistent with fishery management objectives. Harvest hatchery programs shall also separate (e.g., temporally, spatially, visually) hatchery produced and naturally produced native fish in fisheries and on spawning grounds as necessary for conservation. The hatchery program management plan may be designated as one of the following harvest hatchery program types:

- (a) Harvest augmentation, which is used to increase fishing and harvest opportunities where there is no mitigation program in place;

(b) mitigation, which is used pursuant to an agreement to provide fishing and harvest opportunities lost as a result of habitat deterioration, destruction or migration blockage.

(11) Conservation hatchery programs operate to maintain or increase the number of naturally produced native fish without reducing the productivity (e.g., survival) of naturally produced fish populations. Conservation hatchery programs shall integrate hatchery and natural production systems to provide a survival advantage with minimal impact on genetic, behavioral and ecological characteristics of targeted populations. Implementation shall proceed with caution and include monitoring and evaluation to gauge success in meeting goals and control risks. Long-term conservation success shall be tied to remediating causes of the decline that resulted in the need for hatchery intervention. Once goals are met then the hatchery program will be discontinued. The hatchery program management plan may be designated as one of the following conservation hatchery program types:

(a) Supplementation, which routes a portion of an imperiled wild population through a hatchery for part of its life cycle to gain a temporary survival boost, or brings in suitable hatchery produced fish or naturally produced native fish from outside the target river basin to supplement the imperiled local population;

(b) restoration, which outplants suitable non-local hatchery produced or naturally produced native fish to establish a population in habitat currently vacant for that native species using the best available broodstock;

(c) captive brood, which takes a portion or all of an imperiled wild population into a protective hatchery environment for the entire life cycle to maximize survival and the number of progeny produced;

(d) captive rearing, which takes a portion of an imperiled wild population into a protective hatchery environment for only that part of its life cycle that cannot be sustained in the wild;

(e) egg banking, which temporarily removes a naturally produced native fish population from habitats that cannot sustain it and relocates the population to another natural or artificial area that can support the population;

(f) cryopreservation, which freezes sperm from naturally produced native fish for later use in conservation hatchery programs;

(g) experimental, which investigates and resolves uncertainties relating to the responsible use of hatcheries as a management tool for fish conservation and use.

## **Fish Culture Operations**



(12) Fish culture operations shall comply with fish health requirements of OAR 635-007-0549.

(13) Broodstock selection and collection. Hatchery program management plans shall identify the broodstock best able to meet the objectives of the type of program in which the broodstock will be used.

a) For harvest hatchery programs, broodstock shall be used that best meet fishery objectives, consistent with conservation objectives to ensure risk to naturally produced native fish and their watersheds is within acceptable and clearly defined limits

(A) For some harvest hatchery programs, fishery and conservation objectives will be best met using existing hatchery broodstocks and managing for minimal spatial or temporal overlap of hatchery produced and naturally produced native fish in spawning areas.

(B) For other harvest hatchery programs, fishery and conservation objectives will be best met using broodstocks derived from, or transitioning to, naturally produced native fish from the local watershed. This approach shall not be used if available data indicates the donor wild population will be impaired, or if conservation objectives are better met with existing hatchery broodstocks, or if hatchery programs are located in areas with too few naturally produced native fish to supply the hatchery broodstock;

(b) For conservation hatchery programs, broodstock shall be derived from the wild population targeted for hatchery intervention, or from nearby wild or hatchery populations with desired characteristics if the targeted wild population is extirpated or too depressed to provide brood fish;

(c) Broodstock maintenance shall be consistent with the fishery and conservation objectives established for the hatchery program.

(A) Hatchery program management plans shall identify effective population size targets and other strategies to reduce risk of inbreeding depression, genetic drift and domestication for broodstocks developed under subsection (a)(A).

(B) Hatchery program management plans shall identify target and allowable proportions of hatchery produced and naturally produced native fish incorporated into broodstocks developed under subsections (a)(B) and (b), consistent with conservation plan objectives.

(d) Broodstock collected shall represent the genetic variability of the donor stock by taking an unbiased representative sample with respect to run timing, size, gender, age and other traits important for long-term fitness of the population. The Fish Division may approve a deviation from this subsection if necessary to shift run timing and other characteristics of long-term hatchery broodstocks to better coincide with characteristics of wild populations in the watershed or to meet fish management

goals. Hatchery program management plans shall explain the reason for any deviations;

(e) Facilities and methods used to collect broodstock shall minimize stress and maximize survival of fish to spawning, consistent with management objectives.

(14) Disposition of adult hatchery produced fish returning to hatchery facilities. Adult hatchery produced fish returning to collection facilities shall be used to meet program objectives and, if available, provide other ecological, societal and program benefits, consistent with objectives for watershed health and native fish conservation.

(a) Hatchery programs will be managed to meet, but not exceed, program objectives for returning adult fish. Environmental variation and other factors outside of management control may result in significantly less or more fish than planned.

(b) Adult hatchery produced fish returning to hatchery facilities shall be allocated among the categories of uses described in order of preference in subsections (c) and (d). The Department need not satisfy all potential uses within a category before providing fish to uses in lower categories. The Fish Division may approve additional uses or deviations from the stated order of preference to satisfy agreements with management partners, respond to unique situations or respond to unforeseen circumstances.

(c) Order of preference for disposition of adult hatchery produced fish returning to or collected at harvest hatchery program facilities:

(A) meet broodstock needs for the program;

(B) release live, spawned fish back into the wild if specified in management plans for species able to spawn more than once;

(C) provide fish for tribal ceremonial and subsistence use;

(D) provide additional fishing opportunities consistent with management plans (e.g., Fishery Management and Evaluation Plans);

(E) allow hatchery produced fish to spawn naturally at locations and in numbers identified in existing fish management plans or conservation plans developed through the process outlined in the Native Fish Conservation Policy (OAR 635-007-0505);

(F) place carcasses in natural spawning and rearing areas to enhance nutrient recycling, consistent with Department of Environmental Quality requirements, management plans and pathology constraints identified in OAR 635-007-0549;

(G) provide for experimental, scientific or educational uses identified in conservation plans, management plans or other Department agreements;

- (H) sell eggs and carcasses from selected facilities to provide revenues to support hatchery programs and facilities;
  - (I) provide fish to charitable food share programs benefiting needy Oregonians;
  - (J) provide fish for animal feed to animal rehabilitation shelters, zoos, or other such operations;
  - (K) dispose of fish in a landfill or at a rendering plant.
- (d) Order of preference for disposition of adult hatchery produced fish returning to or collected at conservation hatchery program facilities:
- (A) Meet natural spawning objectives of the specific hatchery program as identified in conservation plans;
  - (B) meet hatchery broodstock needs for the specified conservation hatchery program management plan;
  - (C) release live, spawned fish back into the wild if specified in conservation plans for species able to spawn more than once;
  - (D) place carcasses in natural spawning and rearing areas to enhance nutrient recycling, consistent with Department of Environmental Quality requirements, management plans and pathology constraints identified in OAR 635-007-0549;
  - (E) provide fish for tribal ceremonial and subsistence use;
  - (F) provide additional fishing opportunities consistent with fishery management plans (e.g., Fishery Management and Evaluation Plans).
  - (G) provide for experimental, scientific or educational uses identified in conservation plans, management plans or other Department agreements;
  - (H) sell eggs and carcasses to provide revenues to support hatchery programs and facilities;
  - (I) provide fish to charitable food share programs benefiting needy Oregonians;
  - (J) provide fish for animal feed to animal rehabilitation shelters, zoos, or other such operations;
  - (K) dispose of fish in a landfill or at a rendering plant.
- e) Department staff shall use standard, professionally accepted practices (such as sharp blow to head, electrical current or anesthetic overdose) to kill fish at hatchery facilities.

(15) Spawning protocols.

(a) Hatchery program management plans shall include a description of the abundance, size, age structure, gender ratios, fecundity, fertility, and spawning pairings of the broodstock.

(b) A 1:1 male-to-female spawning ratio (single pair mating, unpooled gametes) is preferred, although for harvest hatchery programs with large spawning populations (greater than 300 females) a 1:3 spawning ratio is acceptable.

(c) For critically small populations, a matrix spawning strategy shall be used to enhance effective population size and reduce variability of survival among family units.

(d) Conservation hatchery programs may use natural spawning within natural or engineered spawning channels in an attempt to mimic natural mate selection, gender ratio, age structure, spawn timing and preferred spawning area characteristics of wild populations.

(16) Incubation protocols.

(a) Incubation methods shall be selected to best meet program objectives, consistent with facility and funding constraints. These methods may include single bucket incubation (for isolation of a single female's eggs), multiple vertical incubators, in-stream hatchboxes, or other methods suited to the available facilities. The Integrated Hatcheries Operations Team Policies and Procedures (IHOT 1995) provide acceptable, but not exclusive, guidance on water flows and egg-to-fry capacities for incubation systems. The hatchery program management plan shall include a description of and explanation for the incubation system identified in the plan.

(b) The Department shall continue providing eggs for educational classroom incubators and in-stream incubators (e.g., hatch boxes) for selected stocks in selected watersheds associated with the Salmon and Trout Enhancement Program (STEP). All STEP incubator programs shall be consistent with existing management plans or new conservation plans and hatchery program management plans.

(17) Rearing protocols.

(a) Hatchery program management plans shall describe rearing facilities and methods selected for the program and specific rearing standards used to gauge success meeting program objectives.

(b) Rearing capacity of hatchery programs shall be based on the number of fish that can be produced without adversely affecting fish growth and survivability necessary to meet program objectives.

(c) Water replacement time and velocity shall be managed to provide adequate levels of dissolved oxygen and the reduction of metabolic waste products that are harmful to fish.

(d) Experimental rearing techniques may be investigated at some hatcheries, particularly for conservation hatchery programs, to simulate natural rearing characteristics and fish behavior traits while ensuring adequate fish health, survival and production numbers to meet program objectives.

(e) Fish food and feeding shall be managed to meet production objectives (e.g., fish number, size, growth rate, health and condition), minimize waste and maintain water quality.

(f) The Department shall purchase the best fish feed products available for the best price while considering service delivery, maintenance of competition and innovation among fish feed vendors, and state preferences for recycled products. Qualifying feed manufacturers must monitor the accumulation of toxins in the fish feed they provide, and comply with standards specified by the Department.

(g) The Department shall have standardized procedures for conducting feed trials comparing feed types and coordinate results among fish hatchery managers and STEP facility managers. The Department shall maintain a centralized database of fish feed purchases and fish feed trial results.

(h) Hatchery programs may include an experimental feeding regime designed to simulate natural diets and feeding behavior (such as sub-surface feeding techniques) to align growth, physiology and maturity with natural schedules.

(18) Fish marking.

(a) Hatchery produced fish shall be marked as required to facilitate mixed stock fisheries, research, distinction of hatchery produced and naturally produced native fish throughout their life cycle as necessary for conservation, and evaluation of program objectives.

(b) The Department shall use precise fish marking methods consistent with industry standards and management needs. Mark quality (e.g., fin excision, tag placement, tag retention) shall be monitored during the marking process and prior to fish releases.

(19) Fish transfers and releases.

(a) Hatchery program management plans shall specify targets for the number, size, quality, timing, location and release strategy of fish released, based on fish management objectives established for that program (e.g., native fish conservation plans, brood source objectives, production agreements, harvest management plans, mitigation agreements).

(b) Hatchery program management plans shall include protocols to minimize stress and direct or delayed mortality associated with collecting, handling, loading, transporting and releasing fish.

(c) The Fish Division may approve emergency contingency release plans in the event of unforeseen catastrophic events at a facility.

(d) Transfer and release of any life stage of fish shall meet fish health requirements of OAR 635-007-0549.

(20) Predator control at hatchery facilities.

(a) Hatchery operations shall include strategies to reduce excessive loss of fish to predation and limit opportunities for predators to introduce pathogens to the rearing environment, within funding, facility and permit constraints.

(b) Some hatchery programs, particularly conservation hatchery programs, may experiment with using natural predators to help avoid domestication, reduce deleterious traits and train hatchery produced fish to improve post-release survival and reduce behavioral differences between hatchery produced and naturally produced native fish.

### **Hatchery Facilities Operations**

(21) Hatchery facility operations shall comply with fish health requirements of OAR 635-007-0549.

(22) Hatchery program management plans shall describe hatchery facilities and operations to optimize fish culture operations, comply with fish health requirements described in OAR 635-007-0549, and comply with legal obligations concerning water rights, water use reporting, chemical use and reporting, fish passage and water quality standards ([http://arcweb.sos.state.or.us/rules/OARS\\_600/OAR\\_690/690\\_tofc.html](http://arcweb.sos.state.or.us/rules/OARS_600/OAR_690/690_tofc.html)) (<http://www.leg.state.or.us/ors/509.html>)(<http://www.deq.state.or.us/wq/wqpermit/Gen0300.pdf>)

(23) Reliable hatchery alarm and security systems shall be required as necessary to minimize risk of egg and fish mortalities caused by loss of water supplies or risk of vandalism and poaching. All hatchery incubation systems, rearing containers and adult fish facilities at Department hatcheries shall have alarm systems. Fish Division may grant exceptions for STEP hatch-box facilities or other temporary or remote facilities.

(24) Hatchery water intakes and outfalls shall be screened to minimize the risk of unintended fish entering or escaping from the facility. Outfalls of fish rearing containers shall be double screened if used for fish from outside the basin that could jeopardize endemic stocks if escapes occurred.

(25) The Department shall identify hatchery facility maintenance, modifications and upgrades necessary to comply with program objectives and other legal requirements.

(26) Hatcheries shall provide informational signs and literature, guided tours as allowed by staffing constraints, and other programs to educate the public about fish and wildlife stewardship.

(27) Additional provisions specific to hatchery trout programs.

(a) The Department shall continue hatchery production of nonanadromous rainbow trout for consumptive recreational fisheries as an important and popular fish management tool.

(b) The Department shall reduce potential impacts to wild trout, char and steelhead in streams and maximize returns to the creel such as by rearing and releasing trout for target fisheries in standing water bodies (i.e., lakes, ponds, and reservoirs) and marking trout for targeted fisheries.

(c) All trout the Department purchases for harvest augmentation from private sources must be genetically triploid, sterile rainbow trout.

### **Monitoring and Evaluation**

(28) The purpose of hatchery monitoring and evaluation programs shall be to gauge success meeting hatchery program and fish management objectives, improve understanding of the reasons for success or failure, contain risks within acceptable limits, and provide feedback to modify operations through time (adaptive management). Clear management objectives that describe the role and expectations for hatcheries relative to species conservation, watershed health and fisheries shall be the foundation for all hatchery monitoring and evaluation programs.

(29) Each hatchery program need not have its own individual monitoring and evaluation program if monitoring and evaluation on a landscape perspective provides adequate information to manage potential risks. The greater the uncertainty of the risks or results of a hatchery program, the greater the specificity of the monitoring and evaluation program must be. Each hatchery program management plan shall describe how the plan's operations and objectives will be monitored and evaluated.

(30) Monitoring and evaluation programs shall use generally accepted scientific procedures and gather multi-generational information to evaluate hatchery programs relative to measurable criteria developed through OAR 635-007-0545.

(31) Monitoring hatchery produced fish and their performance may include, but is not limited to:

(a) Broodstock selection including but not limited to source, number, size, fecundity, life history, timing as percent of entire run, disease history, and disease treatment;

- (b) pre-release performance (e.g., survival, growth, disease) by life stage;
- (c) post-release survival to the adult life stage, catch distribution, fishery contributions, straying, and characteristics of adult fish (e.g., age structure, gender ratio, size, health).
- (d) production advantage provided by the hatchery relative to natural production;
- (e) water quality, flow and other physical conditions in the hatchery through the production cycle;
- (f) impacts of operation of the hatchery facilities on the adjacent habitats;
- (g) success of the hatchery program in meeting harvest and/or conservation program objectives.
- (h) cost-benefit analysis of hatchery performance.

(32) Monitoring and evaluation to assess impacts of the hatchery program on naturally produced native fish may include, but is not limited to:

- (a) Impacts of broodstock selection on wild populations;
- (b) ecological interactions of hatchery produced and naturally produced native fish resulting in changes to phenotypic, genotypic, behavioral and survival characteristics;
- (c) timing, location and relative number of hatchery produced fish spawning naturally;
- (d) success of maintaining long-term fitness of wild populations;
- (e) reproductive success and fitness of hatchery produced fish in the natural environment; and
- (f) success maintaining or enhancing natural genetic variation and life history characteristics within and among wild populations.

(33) Results and evaluation of hatchery monitoring programs shall be compiled at intervals adequate to track success, contain risks and provide feedback for adaptive management. Monitoring results shall be made available to management partners and the public.

(34) Hatchery monitoring and evaluation programs shall complement and coordinate with specific research addressing key uncertainties about hatchery operations, uses and consequences. Research priorities shall focus on developing hatchery strategies that minimize the risk or maximize the benefit of hatchery actions to naturally produced native fish populations.



## **635-007-0547**

### **Fish Hatchery Record Keeping**

(1) Hatchery managers shall provide the following records for their operations:

- (a) All Adult Transaction (AAT) records for all adults handled at the facility.
- (b) hatchery Mark Recovery Sampling forms to record adult fish sampled for coded-wire tags;
- (c) Egg and Fry Records (EFR) for all eggs and fry handled at each facility;
- (d) Monthly Poned Fish Reports (MPR) for all fish being reared at each facility;
- (e) Fish Loss Report/Investigation when 1,000 or more juvenile fish or 10 or more adult fish are accidentally lost in a single incident;
- (f) Predator Mortality Report to document any fish predators that may die at the hatchery facility;
- (g) Fish Liberation Reports (FLR) for all juvenile fish released or transported into or out of all Department fish hatchery facilities;
- (h) Coded-Wire Tag Release Reports for all juvenile fish released with coded-wire tags;
- (i) chemical use, waste discharge monitoring, purchasing, budgets, hazardous materials, safety, vehicles, equipment, maintenance and alarm logs.

(2) Hatchery records will be stored in retrievable databases.

(3) The Fish Division may add to or waive the requirements of subsection (1) as necessary to avoid paperwork yet assure proper documentation of hatchery programs.

(4) Fish health documentation shall be maintained by the fish health section.

(5) Each hatchery manager will write a monthly report describing program-specific hatchery activities, either in the form of a hatchery monthly progress report or in the district monthly report for STEP activities.

(6) The Department will produce annual reports, from the data collected with the above records and reports, summarizing all the information regarding adult fish transactions, fish eggs transactions and fish releases.

(7) The Department shall make hatchery operating costs information available on a fiscal year or biennium basis.

Stat. Auth.: ORS 496.012 and 496.138.

Implemented: ORS 496.171, 496.172, 496.176, 496.182, 496.430, 496.435, 496.445, 496.450, and 496.455

Hist.: Adopted 5-9-03, ef. upon filing

## 635-007-0548

### Training of Fish Hatchery Personnel

(1) Fish Division, regional managers, or hatchery managers shall develop training programs for staff to assure awareness of and compliance with hatchery program management plans, to keep staff abreast of new scientific and technological developments and to encourage and support staff career development.

(2) Each hatchery shall establish a training schedule for its staff and maintain training records.

Stat. Auth.: ORS 496.012 and 496.138

Stats. Implemented: ORS 496.171, 496.172, 496.176, 496.182, 496.430, 496.435, 496.445, 496.450, and 496.455

Hist.: Adopted 5-9-03, ef. upon filing

### Definitions

**Aquaria species:** means those fish commonly sold in the pet store trade for use in home aquaria. "Aquaria" are any tanks, pools, ponds, bowls or other containers intended for and capable of holding or maintaining live fish and from which there is no outfall to any waters of this state.

**Brood stock:** means a group of fish, generally from the same population, which are held and eventually artificially spawned to provide a source of fertilized eggs for hatchery programs.

**Cooperative Salmon Hatchery Project:** means a fish propagation enhancement project authorized under OAR 635-009-0400 through OAR 635-009-0455.

**Department:** means the Oregon Department of Fish and Wildlife.

**Disease:** means problems caused by infectious agents, such as parasites or pests, and by other conditions that impair the performance of the body or one of its parts.

**Fish Hatchery:** means a facility at which adult broodstock are held, or where eggs are collected and incubated, or where eggs are hatched, or where fish are reared.

**Hatchery produced fish:** means a fish incubated or reared under artificial conditions for at least a portion of its life.

**Hatchery production system:** means the fish, facilities and operations associated with collecting, spawning, incubating, rearing, distributing and releasing hatchery produced fish.

**Hatchery Program:** means a program in which a specified hatchery population is planted in a specified geographical location.

**Native fish:** means indigenous to Oregon, not introduced. This includes both naturally produced and hatchery produced fish.

**Naturally produced:** means fish that reproduce and complete their full life cycle in natural habitats.

**Natural production system:** means the fish and environment associated with completing the life-cycles of naturally produced fish populations.

**Operation plan:** means an action plan developed by the Department that generally addresses how the objectives in a management plan for harvest or production of a species shall be attained.

**Operation plan:** means an action plan developed by the Department that generally addresses how the objectives in a management plan for harvest or production of a species shall be attained.

**Production:** means the number or pounds of fish raised in a hatchery or resulting from natural spawning and rearing in freshwater, estuarine, or ocean habitats; also used in reference to harvest.

**Propagation of fish:** means the spawning, incubating, and/or rearing of fish by a human for sale, release or other uses.

**Propagation of fish:** means the spawning, incubating, and/or rearing of fish by a human for sale, release or other uses.

**Random mortality:** means fish mortality that generally does not affect the genotypic or phenotypic traits of fish populations.

**Selective mortality:** means fish mortality that generally affects the genotypic and phenotypic traits of fish populations.

## **Appendix C. Fish Health Management Policy**

### **635-007-0960**

#### **Purpose**

The purpose of the Fish Health Management Policy is to describe measures that minimize the impact of fish diseases on the state's fish resources. This policy applies to all Department hatchery operations and programs, including Salmon and Trout Enhancement Program (STEP), fish propagation projects (OAR 635-009-0090 through 635-009-0240), Cooperative Salmon Hatchery Programs (OAR 635-0090400 through 635-009-0455), and to all other persons importing, transporting, releasing, or rearing non-aquaria species in this state, including, but not limited to persons operating private fish rearing facilities and research facilities.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.  
Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

### **635-007-0965**

#### **Policy**

The Department must restrict the introduction, amplification, and dissemination of disease agents in hatchery- produced fish (hatchery-produced stock or naturally-produced native stock) 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 of the state. This entails inspecting and detecting disease agents from fish in all hatchery facilities and natural environments. It also entails containing and treating disease agents to minimize impacts on fish populations.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.  
Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

### **635-007-0970**

#### **Fish Disease and Pathogen Categories**

(1) "Category I" or "Emergency" fish disease agents are those for which there is no known treatment and that have not been determined to occur in Oregon as of September 1, 2003. Disease agents in this category are the European strain of Viral Hemorrhagic Septicemia (VHS), *Onchorhyncus masou* virus (OMV) and Channel Catfish Virus (CCV). Disease agents may be added to this category as they are identified.

(2) "Category II" or "Certifiable" disease agents can be highly contagious, may cause catastrophic losses and do not have a known cure. Disease agents in this category are the North American strain of Viral Hemorrhagic Septicemia (VHS), Infectious

Hematopoietic Necrosis Virus (IHNV), Infectious Pancreatic Necrosis Virus (IPNV), Infectious Salmon Anemia (ISA), Spring Viremia of Carp (SVC), *Myxobolus cerebralis* (whirling disease), and *Piscirickettsia salmonis*. Disease agents may be added to this category as they are identified in state waters or may be moved to a more or less strict category as disease concerns change.

(3) “Category III” or “Reportable” disease agents may be enzootic in populations or watersheds but are not necessarily of such concern as to prevent all transfer or release of fish. This category includes drug resistant strains of fish disease agents otherwise falling in Category IV. Disease agents in this category are Erythrocytic Inclusion Body Syndrome (EIBS virus), Viral Erythrocytic Necrosis Virus (VEN), sturgeon iridovirus, *Renibacterium salmoninarum* (bacterial kidney disease), *Flavobacterium psychrophilum* (cold water disease), *Aeromonas salmonicida* (furunculosis disease), *Yersinia ruckeri* (enteric red mouth disease), drug resistant strains of bacterial disease agents, *Tetracapsuloides bryosalmonae* (Proliferative Kidney Disease), *Ceratomyxa shasta* (ceratomyxosis), and *Nucleospora salmonis*. Disease agents may be added to this category as they are identified in state waters or may be moved to a more or less strict category as disease concerns change.

(4) “Category IV” or “Historical” disease agents are those associated with a particular area, water body, or facility either in Oregon or in another state or country in which fish are raised or where a disease agent is associated with an intermediate non-fish host. This category also includes Category I through III diseases if previously found at a particular facility but no longer occurring there. Disease agents in this category are flatworms, round worms, tapeworms, ciliated and flagellated parasites, myxosporean (other than *Myxobolus cerebralis*, *Tetracapsuloides bryosalmonae* and *Ceratomyxa shasta*), microsporidian parasites (other than *Nucleospora salmonis*), fungal agents, bacterial agents, transient viral agents, and other classes of infectious agents not previously listed. Disease agents may be added to this category as they are identified in state waters or may be moved to a stricter category as disease concerns change.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.  
Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-0975**

### **Import, Export or Transfer of Pathogens and Diseases**

(1) The Department may allow a transfer or release fish if the disease agent has not occurred within the past three years of fish rearing, fish are appropriately treated to prevent disease transmission before transfer, or if the disease agent also occurs in the receiving waters.

(2) No person may import, export, or transfer susceptible fish from a site or area where a Category I disease agent has been found until the Department has determined that the site or area is acceptable and has issued a valid Fish Transport Permit pursuant to OAR 635-007-0600. One of the Department’s fish health specialists may make the required

determination and provide a memorandum to Fish Division.

3) The Department may authorize a person to import, export, or transfer fish that have or are from a station or area with a recent or continuing history of Category II disease agent by issuing a Fish Transport Permit. The Department must restrict the import, transfer, or release of fish from facilities in which Category II disease agents have been detected within the life cycle of a fish species or that have not been eliminated by effective treatment to only those areas where that disease is already endemic. The Department must restrict the transfer or release of fish that may expand the geographic distribution of disease agents in this category.

(4) The Department must restrict the import, transfer, and release of fish from facilities in which Category III disease agents have been detected within the life cycle of a fish species or that have not been eliminated by effective treatment to only those areas where that disease is already endemic.

(5) Fish from facilities with a history of, but no current occurrence of Category I through III diseases will be treated as if they were in Category IV. The Department may issue a Fish Transport Permit for transfer or release of fish with the presence of disease agents in this category if the disease agent has not occurred within the past three years of fish rearing, the fish are appropriately treated for disease before transfer, or the disease agent occurs in the receiving waters. The Department may deny a Fish Transport Permit to transfer or import fish from facilities where Category III and IV diseases agents have been identified until acceptable treatment or improved history record (three years without disease detection) requirements have been met through appropriate fish health examinations.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.  
Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-0980**

### **Additional Reference Material for Fish Disease Management**

Guidelines for inspection of fish for diseases are found in the Integrated Hatchery Operation Team Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries (IHOT 1995), American Fisheries Society Fish Health Blue Book (AFS-FHS Suggested procedures for the detection and identification of certain finfish and shellfish pathogens. 5th ed., 2002, Fish Health Section, American Fisheries Society), the inspection manual of this reference may be found at <http://fisheries.fws.gov/FHC/handbook.htm>), the Fish Health Protection Regulations Manual of Compliance of Canada, 1984 and the Pacific Northwest Fish Health Protection Committee Model Comprehensive Fish Health Protection Program (September 1989), <http://www.efw.bpa.gov/Environment/EW/EWP/DOCS/REPORTS/HATCHERY/A60629.pdf>

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.  
Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-0985**

### **Inspection and Detection of Disease Agents at the Department's Facilities**

(1) The Facility Manager must ensure that inspections are performed on all fish stocks no more than six weeks before fish are released or transferred to other locations in the state and on any fish to be imported into the state. The Department's Fish Health Services must maintain a database of fish health examination results.

(2) The Facility Manager must complete a Fish Liberation Report for the import, export, or transfer of live fish or eggs in Oregon before moving any fish or eggs.

(3) The Facility Manager must ensure regular monitoring of all fish by a Department fish health specialist. Appropriate fish tissues must be screened for the presence of parasitic and bacterial agents and viral examinations of appropriate organs and lesions of moribund or dead fish depending on disease signs on affected fish.

(4) Examinations for *Myxobolus cerebralis*, agent of whirling disease, must be conducted annually on 60 salmonid fish held for a minimum of 180 days at each facility. In cases where multiple water supplies exist, fish reared in each supply must be sampled.

(5) The Facility Manager must direct the treatment or destruction of fish infected with any disease agent, whether listed in these rules or not, that may adversely affect the health of the fish of this state. The Department's Fish Division will determine whether the affected fish must be destroyed.

(6) If fish loss exceeds 0.1 percent per day over five consecutive days in any rearing or incubation container, then the Facility Manager must:

(a) Have an examination promptly performed on live and dead fish from each pond of concern by a Department fish health specialist and, if the fish health specialist determines it is necessary, from the entire facility.

(b) Notify in writing by E-mail, fax, or equivalent means the Department's Regional Office and Fish Division of the location, extent, and probable cause of such losses and provide written documentation of a planned Department-approved treatment regimen to control the fish disease agent.

(c) Fish Health Services must maintain a copy of the disease examination record after completing appropriate tests.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.

Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-0990**

## **Inspection and Detection of Disease Agents at Non-Department Facilities**

- (1) No person may import, export, release, or transfer live fish or fish eggs in Oregon without a Fish Transport Permit issued pursuant to OAR 635-007-0600.
- (2) Except as provided in section (3) of this rule, any group of live fish or eggs found to have been imported into or transferred within Oregon without a Fish Transport Permit is subject to seizure and destruction by the Department.
- 3) The Department, in its discretion, may direct the Facility Manager to undertake immediate steps to obtain proper, up-to-date fish health examinations from the original source of fish or eggs, and to have fish inspected for fish disease agents by a fish health specialist acceptable to the Department. Such fish or eggs must not be released or moved to any other facility until the owner has obtained a completed disease examination report from the fish health specialist. The Facility Manager is responsible for the costs of the inspection required by this rule.
- (4) Except for fish reared for release under a private salmon hatchery permit pursuant to ORS 508.700, before importing any fish the Facility Manager must obtain an annual health examination of broodstock from which fish are to be imported and a copy of relevant fish health examinations of the lot of fish to be imported. If a facility has not previously exported fish to Oregon, the Facility Manager must also obtain a five-year fish-health history of stocks held at the facility and a description of the water supply source. Examinations for IHNV, IPNV, and VHSV must be conducted for salmonid broodstock. An examination for *Myxobolus cerebralis*, as described in section (5) of this rule, must also be conducted on salmonid fish. Depending on the fish species, examinations for culturable viruses and specific bacterial and parasitic agents must be conducted for non-salmonid broodstock. The above-listed examinations must be performed by a fish health specialist acceptable to the Department. However, the Department may issue a Fish Transport Permit to import live fish into this state without the examination report if the Department finds:
  - (a) The fish eggs or larvae would mature to a stage at which they cannot be safely transported before a disease examination could take place or results are complete; and
  - (b) The fish or eggs are held in a facility approved by the Department until the permit holder can obtain a completed disease examination report.
- (5) Examinations for *Myxobolus cerebralis*, agent of whirling disease, must be conducted annually on 60 fish held for a minimum of 180 days at each facility. In cases where multiple water supplies exist, fish reared in each supply must be sampled.
- (6) Fish Health Services must maintain a database of fish health examination results.
- (7) Any fish found to be infected with a disease agent that the Department determines may adversely affect the health of the fish of this state must be treated or destroyed at the Facility Manager's expense as directed by the Department or may be sold for human



consumption, if appropriate.

(8) If fish loss exceeds 0.1 percent per day over five consecutive days in any rearing or incubation container, the Facility Manager, Facility Permittee, or Fish Propagation Licensee must:

(a) Have an examination promptly performed on live and dead fish from each pond of concern by a fish health specialist acceptable to the Department and, if required by the Department, from the entire facility.

b) Notify in writing by E-mail, fax, or equivalent means the Department's Fish Division at its Headquarters and Fish Health Services laboratories in Corvallis, Clackamas and La Grande of the location, extent, and probable cause of such losses and provide written documentation of a treatment regimen planned to control the fish disease; and

(c) Provide Fish Health Services a copy of the disease examination record within seven business days after completion of appropriate tests.

(9) Failure to comply with these rules is grounds for the revocation of any Fish Propagation License, Cooperative Salmon Hatchery Agreement, or Fish Transport Permit.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.

Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-0995**

### **Containment and Treatment of Fish Disease Agents**

(1) The Department may approve the transfer or release of fish or issue a Fish Transport Permit with special conditions, depending on the disease history of the shipping station or watershed, the current disease inspection report, or the susceptibility of fish to disease agents endemic in the watershed to which the fish would be shipped.

(2) The Oregon exporter and importer (recipient) are responsible for getting the required permits and complying with all regulations concerning transporting fish within Oregon and importing fish to Oregon from any other state, province, or country.

(3) The annual examination (station check) of salmonids sampled at a particular hatchery for *M. cerebralis* must meet Oregon's requirements for *M. cerebralis* import or transfer of fish from that facility to or within Oregon.

(4) If the Department determines that live fish have a disease agent that may affect fish in Oregon, the fish may not be transported from one watershed to another within this state or exported from this state without the Department's written consent. The Department may restrict or prohibit a person from transporting infected fish or fish suspected of being

infected to or from certain watersheds or areas within watersheds of the state.

(5) The Department may authorize a person to transfer salmonids from any waters of the state or other states without a health inspection to a facility approved by the Department for scientific study pursuant to the objectives of projects acceptable to the Department.

(6) Fish at all Department facilities must be treated so as to reduce the amplification of disease agents. Protocols listed in sub-paragraphs (a)-(c) are required for all Department facilities and are recommended for privately operated fish facilities to minimize the amplification of disease agents within their facilities.

(a) When fish disease agents are detected, preventative and therapeutic strategies must be implemented to reduce the impact of such disease agents on both hatchery-reared and naturally-reared native fish populations.

(b) Sanitation protocols:

(A) Eggs must be disinfected or water-hardened in buffered iodophor. Eggs must be disinfected after collection and, if transferred to a new facility, they must also be disinfected upon arrival. Imported eggs and their shipping containers must be disinfected at the approved destination using methods acceptable to the Department's fish health specialists. (A list of acceptable disinfecting agents and methods is available from the Department).

(B) Disinfection footbaths or other means of disinfection must be provided at the incubation facility's entrance and exit areas for sanitizing footwear, raingear, and equipment while embryos are incubating in the facility.

(C) Equipment and rain gear used in broodstock handling or spawning must be sanitized after leaving the adult area and before being used in other rearing units or the hatch-house building.

(D) Equipment used to collect dead fish must be sanitized before being used in another pond, or equipment must be designated for each specific pond.

(E) Dead fish must be disposed of promptly and in a manner that will prevent the introduction of disease agents to waters of the State.

(F) Rearing units must be cleaned on a regular basis by vacuuming, brushing, or flushing. All equipment used for this purpose must be disinfected before being moved to a different pond.

(G) Equipment used to transfer eggs or fish among facilities, including fish liberation tankers, must be sanitized before being used with any other fish lot or at any other location. Disinfecting and disinfected water must be disposed of in an approved manner.

(H) Rearing units must be sanitized after removing fish and before introducing a

new fish stock either by thoroughly cleaning the unit and using a disinfectant or by cleaning it and leaving it to dry for a minimum of three days.

(I) Use of pathogen-free water is preferable, especially for egg incubation and early fish rearing.

(c) Preventative and therapeutic fish health strategies must be implemented at all facilities in consultation with the Department's personnel to avoid or reduce disease agents and fish losses. Fish health strategies may include the following:

(A) Modifying hatchery practices such as water temperature, feeding or cleaning regimes, egg culling operations, isolating containers of infected fish, and using a different water supply;

(B) Changing release strategies, if approved by the Department's Fish Division;

(C) Destroying fish if the disease agent is untreatable and an epizootic event is likely, or where an exotic or non-endemic disease agent is detected, if approved by Fish Division;

(D) Increasing water releases from reservoirs when possible to increase flows and reduce water temperature.

(E) Treating fish with federally approved chemicals or drugs from one of the following categories:

(i) FDA-labeled and approved for use on food fish;

(ii) Allowed by the FDA as an Investigational New Animal Drug;

(iii) Obtained by extra-label prescriptions from veterinarians;

(iv) Allowed by the FDA as low regulatory priority or deferred regulatory status;

(v) Chemicals not allowed on food fish but approved by the FDA through the US Fish and Wildlife Service for fish listed under the federal Endangered Species Act.

(7) In order to continue improving the Department's expertise in fish health, the Department must develop and maintain partnerships with fish health specialists from other state and federal agencies, universities, and management partners.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.

Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## **635-007-1000**

### **Carcasses for Stream Enrichment**

(1) Before approving the use of fish carcasses or fish components for stream enrichment programs, the Fish Division must determine that the use is consistent with the Department of Environmental Quality's requirements.

(2) The Department must review the disease history of the hatchery and particular fish stock, current fish health testing results, geographic location and history of fish disease, and presence of disease agents in the receiving stream and watershed as a whole in order to minimize the risk of introducing or disseminating disease agents into the receiving waters.

(3) Only fish that are killed as excess brood or that survive to spawn may be used for carcass distribution.

(4) Carcasses must be placed in the originating river basin or where identified in hatchery program management plans or other operational or conservation plans.

(5) The Fish Division may stop carcass distribution if pathogen levels increase in spawned adult fish during the spawning period.

Stat: Auth.: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Stats.

Implemented: ORS 496, ORS 497, ORS 498, ORS 506 and ORS 508 Hist.:

## Appendix D: Release and Recovery Data

**Table 86. Summary of release and recovery data for ODFW coastal salmon and steelhead programs.**

| Release Information |             |                               |                  |                       |                              | Average number recovered in Ocean Fisheries |       |     |       |     |       |            | Average number recovered in FW |          |          |                  |           | Total Harvest | OR catch |
|---------------------|-------------|-------------------------------|------------------|-----------------------|------------------------------|---------------------------------------------|-------|-----|-------|-----|-------|------------|--------------------------------|----------|----------|------------------|-----------|---------------|----------|
| Species             | Hatchery    | Stock                         | Release Basin    | Brood years           | Average smolt release number | AK                                          | BC    | WA  | OR    | CA  | Sport | Commercial | Col Gill net                   | FW Sport | Hatchery | Spawning Grounds | Dam count |               |          |
| Coho                | Nehalem     | Nehalem (32)<br>Fishhawk (99) | Nehalem          | 1995-2004             | 186,113                      | 0                                           | 2     | 78  | 111   | 17  | 195   | 13         | 2                              | 418      | 1,510    | UNK              |           | 627           | 530      |
| Coho                | Nehalem     | Trask (34)                    | Trask R          | 1995-2004             | 153,321                      | 3                                           | 0     | 200 | 305   | 12  | 490   | 29         | 0                              | 370      | 5,245    | UNK              |           | 889           | 674      |
| Coho                | Rock Creek  | Umpqua (55)                   | Umpqua R, N Fk   | 1995-2004             | 105,695                      | 1                                           | 8     | 71  | 262   | 16  | 341   | 18         | 3                              | 2,959    | UNK      | UNK              | 7,759     | 3,320         | 3,224    |
|                     |             |                               |                  |                       |                              |                                             |       |     |       |     |       |            |                                |          |          |                  |           |               |          |
| Spring Chinook      | Trask       | Trask (34)                    | Trask R          | 1994-2003             | 101,982                      | 86                                          | 128   | 48  | 107   | 0   | 39    | 330        | 0                              | 553      | 230      | UNK              |           | 922           | 660      |
| Spring Chinook      | Trask       | Trask (34)                    | Wilson R         | 1994-2003 (excl 2001) | 145,063                      | 68                                          | 102   | 28  | 75    | 0   | 32    | 241        | 0                              | 163      | 194      | UNK              |           | 436           | 238      |
| Spring Chinook      | Cedar Creek | Nestucca (47)                 | Nestucca R       | 1994-2003             | 116,402                      | 66                                          | 156   | 48  | 81    | 0   | 30    | 321        | 0                              | 571      | 88       | UNK              |           | 921           | 651      |
| Spring Chinook      | Rock Creek  | Umpqua (55)                   | Umpqua R, Nth Fk | 1994-2003             | 316,232                      | 29                                          | 134   | 164 | 1,218 | 218 | 191   | 1,572      | 9                              | 1,726    | UNK      | UNK              | 7,362     | 3,498         | 2,953    |
|                     |             |                               |                  |                       |                              |                                             |       |     |       |     |       |            |                                |          |          |                  |           |               |          |
| Fall Chinook        | Trask       | Trask (34)                    | Necanicum R      | 1994-2003             | 26,618                       | 105                                         | 54    | 7   | 3     | 1   | 18    | 151        | 1                              | 31       | UNK      | UNK              |           | 201           | 35       |
| Fall Chinook        | Trask       | Trask (34)                    | Trask R          | 1994-2003             | 78,768                       | 249                                         | 167   | 7   | 38    | 1   | 102   | 360        | 0                              | 643      | 988      | UNK              |           | 1,106         | 682      |
| Fall Chinook        | Salmon R    | Salmon R (36)                 | Salmon R         | 1994-2003             | 202,592                      | 568                                         | 348   | 11  | 80    | 1   | 174   | 834        | 0                              | 932      | 102      | 1,308            |           | 1,939         | 1,012    |
| Fall Chinook        | Salmon R    | Yaquina (146)                 | Yaquina R        | 1994-2003             | 119,965                      | 538                                         | 358   | 1   | 36    | 0   | 179   | 753        | 0                              | UNK      | UNK      | UNK              |           | 933           | UNK      |
| Fall Chinook        | Bandon      | Coos (37)                     | Coos Basin       | 1994-2003             | 760,767                      | 1,153                                       | 1,188 | 232 | 277   | 7   | 558   | 2,299      | 0                              | 1,169    | 3,447    | UNK              |           | 4,026         | 1,446    |

| Release Information |                        |                     |                      |                  |         | Average number recovered in Ocean Fisheries |     |     |       |     |     |       | Average number recovered in FW |       |       |       |       |       |       |
|---------------------|------------------------|---------------------|----------------------|------------------|---------|---------------------------------------------|-----|-----|-------|-----|-----|-------|--------------------------------|-------|-------|-------|-------|-------|-------|
| Fall Chinook        | Bandon/Butte Falls     | Coquille R (44)     | Coquille R           | 1994 & 1997-2003 | 76,972  | 294                                         | 277 | 33  | 79    | 2   | 107 | 577   | 0                              | 220   | UNK   | UNK   |       | 724   | 240   |
| Fall Chinook        | Elk R                  | Elk R (35)          | Elk R                | 1994-2003        | 325,508 | 534                                         | 454 | 186 | 1,444 | 15  | 149 | 2,483 | 0                              | 1,073 | 1,591 | 2,026 |       | 3,705 | 2,516 |
| Fall Chinook        | Elk R                  | Chetco (96)         | Chetco R             | 1994-2003        | 172,927 | 0                                           | 2   | 8   | 298   | 157 | 97  | 367   | 1                              | 200   | UNK   | UNK   |       | 665   | 499   |
|                     |                        |                     |                      |                  |         |                                             |     |     |       |     |     |       |                                |       |       |       |       |       |       |
| Summer Steelhead    | Cedar Creek            | Nestucca (47)       | Wilson R             | 1996-2005        | 40,160  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 507   | NA    | UNK   |       | 507   | 507   |
| Summer Steelhead    | Cedar Creek            | Nestucca (47)       | Nestucca R           | 1996-2005        | 63,044  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 619   | 1,796 | UNK   |       | 619   | 619   |
| Summer Steelhead    | Salmon River           | Siletz (33)         | Siletz R             | 1996-2005        | 67,343  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 1,419 | NA    | UNK   | 2,689 | 1,419 | 1,419 |
| Summer Steelhead    | Rock Creek             | Umpqua (55)         | Umpqua R Nth Fk      | 1996-2005        | 62,710  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 1,503 | NA    | UNK   |       | 1,503 | 1,503 |
|                     |                        |                     |                      |                  |         |                                             |     |     |       |     |     |       |                                |       |       |       |       |       |       |
| Winter Steelhead    | Nehalem                | Nehalem (32)        | Necanicum R          | 1996-2005        | 40,419  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 406   | NA    | UNK   |       | 406   | 406   |
| Winter Steelhead    | Nehalem                | Nehalem (32)        | Nehalem R Nth Fk     | 1996-2005        | 94,877  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 1,092 | 1,704 | UNK   |       | 1,092 | 1,092 |
| Winter Steelhead    | Cedar Creek/Trask      | Nestucca R (47/121) | Wilson and Kilchis R | 1996-2005        | 73,846  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 2,109 | NA    | UNK   |       | 2,109 | 2,109 |
| Winter Steelhead    | Cedar Creek            | Nestucca R (47W)    | Nestucca R           | 1996-2005        | 107,429 | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 1,509 | 1,876 | UNK   |       | 1,509 | 1,509 |
| Winter Steelhead    | Alsea                  | Siletz (33W)        | Siletz R             | 1996-2005        | 52,203  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 1,908 | NA    | UNK   | 461   | 1,908 | 1,908 |
| Winter Steelhead    | Alsea                  | Alsea R (43)        | Big Elk Cr           | 1996-2005        | 20,533  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 201   | NA    | UNK   |       | 201   | 201   |
| Winter Steelhead    | Alsea                  | Alsea R (43/43W)    | Alsea R, Nth Fk      | 1996-2005        | 83,575  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 2,325 | 3,036 | UNK   |       | 2,325 | 2,325 |
| Winter Steelhead    | Bandon                 | Ten Mile (88)       | Ten Mile Basin       | 1996-2005        | 20,468  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 209   | NA    | UNK   |       | 209   | 209   |
| Winter Steelhead    | Butte Falls/Rock Creek | Cow Creek 018       | Umpqua R S Fk        | 1996-2005        | 77,582  | NA                                          | NA  | NA  | NA    | NA  |     |       | NA                             | 3,233 | NA    | UNK   |       | 3,233 | 3,233 |

| Release Information |           |                   |                |           |         | Average number recovered in Ocean Fisheries |    |    |    |    |  | Average number recovered in FW |       |     |     |  |       |       |
|---------------------|-----------|-------------------|----------------|-----------|---------|---------------------------------------------|----|----|----|----|--|--------------------------------|-------|-----|-----|--|-------|-------|
| Winter Steelhead    | Bandon    | Coos (37)         | Coos Basin     | 1996-2005 | 132,260 | NA                                          | NA | NA | NA | NA |  | NA                             | 1,533 | UNK | UNK |  | 1,533 | 1,533 |
| Winter Steelhead    | Bandon    | Coquille (44/144) | Coquille Basin | 1996-2005 | 57,445  | NA                                          | NA | NA | NA | NA |  | NA                             | 2,360 | NA  | UNK |  | 2,360 | 2,360 |
| Winter Steelhead    | Elk River | Chetco (96)       | Chetco R       | 1996-2005 | 47,908  | NA                                          | NA | NA | NA | NA |  | NA                             | 832   | NA  | UNK |  | 832   | 832   |

## Appendix E. Master Maintenance Plan

**Table 87. All deferred maintenance items at ODFW coastal hatcheries**

| Site Name      | Site / Building                                                | System # | System Name                       | Repair Amt    | Comment                                                                                                                              |
|----------------|----------------------------------------------------------------|----------|-----------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Alsea Hatchery |                                                                |          |                                   |               |                                                                                                                                      |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          |          |                                   |               |                                                                                                                                      |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1051     | PAVED VEHICLE SURFACES - CONCRETE | \$ 121.00     | The concrete vehicular surfaces have holes and deterioration such as surface cracking.                                               |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1052     | PAVED VEHICLE SURFACES - GRAVEL   | \$ 9,518.00   | The gravel vehicle surface areas have holes that need to be filled and graded.                                                       |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1061     | PAVED WALKS/SURFACES - CONCRETE   | \$ 544.00     | The concrete walk surfaces exhibit numerous holes.                                                                                   |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1400     | GRATING                           | \$ 100.00     | A few areas of grating are beginning to rust.                                                                                        |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1410     | METAL VALVES - SMALL 2-6"         | \$ 5,441.00   | A majority of the small valves are leaking and need to be repaired.                                                                  |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1411     | METAL VALVES - MEDIUM 7-11"       | \$ 4,200.00   | A majority of the medium valves are leaking and need to be repaired.                                                                 |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1412     | METAL VALVES - LARGE 12-18"       | \$ 7,329.00   | A majority of the large valves are leaking and need to be repaired.                                                                  |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1413     | METAL VALVES - X-LARGE >18"       | \$ 1,832.00   | A majority of the x-large valves are leaking and need to be repaired.                                                                |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1420     | REARING RACEWAY - CONCRETE        | \$ 101,244.00 | A majority of the concrete rearing raceway is cracked and seeping.                                                                   |
| Alsea Hatchery | Site - Alsea Hatchery - Site # : AlSH                          | 1431     | SETTLING PONDS - ASPHALT          | \$ 69,380.00  | Approximately 50% of the asphalt settling ponds are cracked, leaking and settling unevenly.                                          |
| Alsea Hatchery | Building - Residence 1 (1948) - Building # : AlSH-02001        |          |                                   |               |                                                                                                                                      |
| Alsea Hatchery | Building - Residence 1 (1948) - Building # : AlSH-02001        | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$ 2,621.00   | The eaves are dry rotting and need to be replaced/repaired accordingly. 100% of the exterior walls need to be scraped and repainted. |
| Alsea Hatchery | Building - Residence 1 (1948) - Building # : AlSH-02001        | 2190     | EXTERIOR STAIRS - CONCRETE        | \$ 100.00     | 10% of the exterior concrete stairs are cracked and chipping.                                                                        |
| Alsea Hatchery | Building - Residence 1 (1948) - Building # : AlSH-02001        | 2222     | PORCHES WITH ROOFS                | \$ 122.00     | 20% of the porch needs to be repaired.                                                                                               |
| Alsea Hatchery | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002 |          |                                   |               |                                                                                                                                      |
| Alsea Hatchery | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002 | 2010     | CRAWL SPACE / 4 FT FOUNDATION     | \$ 4,925.00   | The floor joists are rotted and need to be replaced.                                                                                 |
| Alsea Hatchery | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002 | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$ 547.00     | Part of the eaves are dry rotted and need to be replaced.                                                                            |
| Alsea Hatchery | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002 | 2190     | EXTERIOR STAIRS - CONCRETE        | \$ 100.00     | Approximately 10% of the exterior concrete stairs are cracked and chipping. They need to be repaired.                                |
| Alsea Hatchery | Building - Residence 3 (1934) - Building # : AlSH-02003        |          |                                   |               |                                                                                                                                      |
| Alsea Hatchery | Building - Residence 3 (1934) - Building # : AlSH-02003        | 4023     | CEILING SURFACES - GWB            | \$ 404.00     | The kitchen ceiling has some dry rot and needs to be repaired.                                                                       |



| Site Name       | Site / Building                                                         | System # | System Name                                | Repair Amt   | Comment                                                                                                               |
|-----------------|-------------------------------------------------------------------------|----------|--------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------|
| Alsea Hatchery  | Building - Residence w/3 Bdrm + Garage (1962) - Building # : AlSH-02004 | 2050     | WOOD, VINYL, OR ALUM WALLS                 | \$ 2,856.00  | The wood walls need to be scraped and the eaves are dryrotted and the roof is coming off because of                   |
| Alsea Hatchery  | Building - Residence w/3 Bdrm + Garage (1962) - Building # : AlSH-02004 | 3040     | HOT & COLD WATER DISTRIBUTION - GALVANIZED | \$ 112.00    | Much of the piping is rusted and needs to be replaced.                                                                |
| Alsea Hatchery  | Building - Hatchery (1934) - Building # : AlSH-02013                    |          |                                            |              |                                                                                                                       |
| Alsea Hatchery  | Building - Hatchery (1934) - Building # : AlSH-02013                    | 4022     | CEILING SURFACES - ADHERED TILES           | \$ 100.00    | Approximately 20% of the adhered tiles need to be replaced or repainted.                                              |
| Alsea Hatchery  | Building - Hatchery (1934) - Building # : AlSH-02013                    | 4023     | CEILING SURFACES - GWB                     | \$ 247.00    | A small portion of the ceiling surface is rotting. The surface needs to be replaced.                                  |
| Alsea Hatchery  | Building - Hatchery Offices (1634) - Building # : AlSH-02015            |          |                                            |              |                                                                                                                       |
| Alsea Hatchery  | Building - Hatchery Offices (1634) - Building # : AlSH-02015            | 2040     | VERTICAL STRUCTURE                         | \$ 153.00    | There is visible cracking on the corner and leaking may become a problem.                                             |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  |          |                                            |              |                                                                                                                       |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1060     | PAVED WALKS/SURFACES - ASPHALT             | \$ 100.00    | Portions of the asphalt walkways are missing surface, requiring a new seal coat.                                      |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1061     | PAVED WALKS/SURFACES - CONCRETE            | \$ 100.00    | Replace a small percentage of concrete with cracking and chipping.                                                    |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1290     | SANITARY LINES                             | \$ 1,200.00  | The lines are deteriorating and need to be replaced.                                                                  |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1400     | GRATING                                    | \$ 100.00    | A small percentage of the metal grating need to be replaced.                                                          |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1412     | METAL VALVES - LARGE 12-18"                | \$ 880.00    | The valve stem of one large valve will not operate. The valve stem needs to be replaced.                              |
| Bandon Hatchery | Site - Bandon Hatchery - Site # : BndH                                  | 1420     | REARING RACEWAY - CONCRETE                 | \$ 15,577.00 | Some of the concrete walls and floors are cracked and need to be patched.                                             |
| Bandon Hatchery | Building - Residence 1 (1929) - Building # : BndH-06065                 |          |                                            |              |                                                                                                                       |
| Bandon Hatchery | Building - Residence 1 (1929) - Building # : BndH-06065                 | 4011     | WALL SURFACE - GWB                         | \$ 680.00    | A portion of the interior walls are cracked and need to be repainted.                                                 |
| Bandon Hatchery | Building - Residence 1 (1929) - Building # : BndH-06065                 | 4023     | CEILING SURFACES - GWB                     | \$ 215.00    | The GWB ceilings need patchwork and there is minor cracking exists.                                                   |
| Bandon Hatchery | Building - Residence 1 (1929) - Building # : BndH-06065                 | 4040     | DOORS & FRAMES                             | \$ 3,860.00  | The doors throughout the house are damaged and the hardware is no longer functioning properly. The hardware. The      |
| Bandon Hatchery | Building - Residence 1 (1929) - Building # : BndH-06065                 | 4070     | CASEWORK                                   | \$ 4,200.00  | The casework needs replacing. The casework and the drawers do not open/close properly. The casework is built out of p |
| Bandon Hatchery | Building - Cold Storage Building (1953) - Building # : BndH-06072       |          |                                            |              |                                                                                                                       |
| Bandon Hatchery | Building - Cold Storage Building (1953) - Building # : BndH-06072       | 2171     | WOOD DOORS                                 | \$ 1,142.00  | Two wood doors are damaged and need to be replaced.                                                                   |

| Site Name            | Site / Building                                                   | System # | System Name                       | Repair Amt   | Comment                                                                                                                                                                                                          |
|----------------------|-------------------------------------------------------------------|----------|-----------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bandon Hatchery      | Building - Cold Storage Building (1953) - Building # : BndH-06072 | 4011     | WALL SURFACE - GWB                | \$ 469.00    | Portions of the plaster walls are crumbling and damaged plaster.                                                                                                                                                 |
| Bandon Hatchery      | Building - Hatchery (1934) - Building # : BndH-06075              |          |                                   |              |                                                                                                                                                                                                                  |
| Bandon Hatchery      | Building - Shop Metal (1978) - Building # : BndH-06077            |          |                                   |              |                                                                                                                                                                                                                  |
| Bandon Hatchery      | Building - Shop Metal (1978) - Building # : BndH-06077            | 2171     | WOOD DOORS                        | \$ 348.00    | The hardware is busted and the doors do not close properly. Replace the hardware and adjust the doors.                                                                                                           |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       |          |                                   |              |                                                                                                                                                                                                                  |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1050     | PAVED VEHICLE SURFACES - ASPHALT  | \$ 640.00    | The asphalt surfaces in the driveway are cracked, crumbling, cracking and need to be resurfaced.                                                                                                                 |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1051     | PAVED VEHICLE SURFACES - CONCRETE | \$ 2,382.00  | The concrete driveways were installed many years ago. Some large spans of time. Some driveways are crumbling, falling apart and a need to be replaced.                                                           |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1061     | PAVED WALKS/SURFACES - CONCRETE   | \$ 755.00    | Portions of the older pathways are crumbling and need root systems. Replace the cracked concrete to be a tripping hazard a                                                                                       |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1191     | LANDSCAPE RETAINING WALL - WOOD   | \$ 10,994.00 | The railroad retaining wall Northwest of the building 15007 is rotting and falling apart and needs to be replaced.                                                                                               |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1201     | DRAINAGE - SURFACE RUNOFF         | \$ 18,034.00 | In times of heavy rain, water runs down the driveway of building 15112 and ponds in back of building. There are major problems with the drainage system frequent leaks. The damaged portions need to be replaced |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1260     | WATER LINES                       | \$ 31,677.00 |                                                                                                                                                                                                                  |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1410     | METAL VALVES - SMALL 2-6"         | \$ 18,048.00 | 30 valves are old/worn out and need to be replaced                                                                                                                                                               |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1411     | METAL VALVES - MEDIUM 7-11"       | \$ 3,000.00  | 2 valves are old/worn out and need to be replaced                                                                                                                                                                |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1412     | METAL VALVES - LARGE 12-18"       | \$ 10,000.00 | 3 valves are old/worn out and need to be replaced                                                                                                                                                                |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1413     | METAL VALVES - X-LARGE >18"       | \$ 7,000.00  | 2 extra large valves do not fully close and need to be replaced                                                                                                                                                  |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1420     | REARING RACEWAY - CONCRETE        | \$ 59,376.00 | The majority of the raceways are under the building and are degraded. The concrete is chipping and needs to be patched                                                                                           |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                       | 1432     | SETTLING PONDS - EARTH            | \$ 11,250.00 | Settling ponds are not working properly and need to be replaced in 2006.                                                                                                                                         |
| Butte Falls Hatchery | Building - Office (3 room) (1937) - Building # : BtFH-15028       |          |                                   |              |                                                                                                                                                                                                                  |
| Butte Falls Hatchery | Building - Office (3 room) (1937) - Building # : BtFH-15028       | 2040     | VERTICAL STRUCTURE                | \$ 1,170.00  | Building is leaning 2" to the back of the foundation. The structure needs to be leveled out                                                                                                                      |
| Butte Falls Hatchery | Building - Office (3 room) (1937) - Building # : BtFH-15028       | 2081     | ASPHALT OR FIBERGLASS SHINGLES    | \$ 1,529.00  | The roof is extremely weathered and needs to be replaced. The roof is covered with moss, cracking & needs to be replaced                                                                                         |

| Site Name            | Site / Building                                                        | System # | System Name                | Repair Amt   | Comment                                                                                                                                                                  |
|----------------------|------------------------------------------------------------------------|----------|----------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Butte Falls Hatchery | Building - Office (3 room) (1937) - Building # : BtFH-15028            | 2150     | SMALL WINDOWS (<15)        | \$ 625.00    | The window is broken and needs to be replaced.                                                                                                                           |
| Butte Falls Hatchery | Building - Office (3 room) (1937) - Building # : BtFH-15028            | 4033     | RESILIENT FLOORING         | \$ 1,096.00  | The floor is chipped and the seams need to be replaced.                                                                                                                  |
| Butte Falls Hatchery | Building - Storage/Wood Shop Building (1937) - Building # : BtFH-15034 |          |                            |              |                                                                                                                                                                          |
| Butte Falls Hatchery | Building - Storage/Wood Shop Building (1937) - Building # : BtFH-15034 | 2100     | CHIMNEYS                   | \$ 3,300.00  | The chimney for the wood stove is cracked and needs to be replaced.                                                                                                      |
| Butte Falls Hatchery | Building - Storage/Wood Shop Building (1937) - Building # : BtFH-15034 | 2221     | PATIOSWITHOUT ROOFS        | \$ 100.00    | The cement landings outside of the garage are cracked laterally and needs to be replaced.                                                                                |
| Butte Falls Hatchery | Building - Storage/Wood Shop Building (1937) - Building # : BtFH-15034 | 2240     | GARAGE                     | \$ 46,209.00 | The 3 car garage on the end, built in 1937. A tree root has broken the foundation and is unsafe. T                                                                       |
| Butte Falls Hatchery | Building - Shop - Building # : BtFH-15036                              |          |                            |              |                                                                                                                                                                          |
| Butte Falls Hatchery | Building - Shop - Building # : BtFH-15036                              | 2050     | WOOD, VINYL, OR ALUM WALLS | \$ 860.00    | The paint on the exterior walls is peeling. The walls need to be scraped and repainted. The window frames are weathered and the frames need to be scraped and repainted. |
| Butte Falls Hatchery | Building - Shop - Building # : BtFH-15036                              | 2150     | SMALL WINDOWS (<15)        | \$ 711.00    |                                                                                                                                                                          |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    |          |                            |              |                                                                                                                                                                          |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 2050     | WOOD, VINYL, OR ALUM WALLS | \$ 769.00    | The painted exterior walls are severely weathered to be scraped & repainted.                                                                                             |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 2051     | MASONRY WALLS              | \$ 266.00    | The walls are chipping/crumbling and need to be resurfaced/reinforced.                                                                                                   |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 2150     | SMALL WINDOWS (<15)        | \$ 178.00    | The windows are lacking paint and are severely weathered. The windows are scraped and repainted.                                                                         |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 2151     | MEDIUM WINDOWS (15>30 SF)  | \$ 1,447.00  | The windows are broken and require replacement.                                                                                                                          |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 2171     | WOOD DOORS                 | \$ 115.00    | The paint is worn off and the hardware on the door needs to be scraped/painted and the hardware needs to be replaced.                                                    |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 4011     | WALL SURFACE - GWB         | \$ 100.00    | There is a 1'X1' hole in the restroom wall that needs to be repaired.                                                                                                    |
| Butte Falls Hatchery | Building - Storage Building (2 restrooms) - Building # : BtFH-15037    | 4023     | CEILING SURFACES - GWB     | \$ 228.00    | The paint is peeling off the wood panels and needs to be repainted for the ceiling. The panels need to be replaced.                                                      |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038       |          |                            |              |                                                                                                                                                                          |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038       | 2150     | SMALL WINDOWS (<15)        | \$ 1,245.00  | Several window panes are cracked and need to be replaced. The frames need to be repaired to prevent rotting.                                                             |

| Site Name            | Site / Building                                                  | System # | System Name                | Repair Amt   | Comment                                                                                                                            |
|----------------------|------------------------------------------------------------------|----------|----------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------|
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 2151     | MEDIUM WINDOWS (15>30 SF)  | \$ 889.00    | Several window panes are cracked and need to be replaced. The frames need to be replaced to prevent rotting.                       |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 2171     | WOOD DOORS                 | \$ 695.00    | The paint is peeling off of the door. The door is small to drive a forklift through for food pa                                    |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 2221     | PATIOSWITHOUT ROOFS        | \$ 1,380.00  | Concrete pad in front of building is cracked and needs to be replaced.                                                             |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 4011     | WALL SURFACE - GWB         | \$ 1,757.00  | The GWB walls in the grinder space need to be refinished. The paint and plaster are peeling off.                                   |
| Butte Falls Hatchery | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 4023     | CEILING SURFACES - GWB     | \$ 2,699.00  | The GWB ceiling in the grinder space needs to be refinished. The paint and plaster are peeling off.                                |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          |          |                            |              |                                                                                                                                    |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 2020     | BASEMENT / 8 FT FOUNDATION | \$ 60,462.00 | The basement floods due to a spring leak.                                                                                          |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 2150     | SMALL WINDOWS (<15)        | \$ 3,645.00  | The basement windows are leaking and need to be replaced.                                                                          |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 2190     | EXTERIOR STAIRS - CONCRETE | \$ 210.00    | The stairs are cracked/chipping and need to be patched and resealed.                                                               |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 2240     | GARAGE                     | \$ 4,248.00  | The garage foundation is cracked and needs to be broken.                                                                           |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 4011     | WALL SURFACE - GWB         | \$ 1,075.00  | The GWB in the attic & basement needs to be taped and finished. The resident needs to do these repairs.                            |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 4023     | CEILING SURFACES - GWB     | \$ 709.00    | The GWB in attic & basement is poorly taped and finished. The resident needs to do repairs.                                        |
| Butte Falls Hatchery | Building - Residence 1 (1928) - Building # : BtFH-15111          | 4032     | WOOD FLOORS                | \$ 1,849.00  | Approximately 50% of the wood floors are stained and need to be refinished.                                                        |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          |          |                            |              |                                                                                                                                    |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 2100     | CHIMNEYS                   | \$ 100.00    | The bricks are loose at the top of the chimney and need to be repaired/secured.                                                    |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 2150     | SMALL WINDOWS (<15)        | \$ 100.00    | The window is broken and needs to be replaced.                                                                                     |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 2221     | PATIOSWITHOUT ROOFS        | \$ 204.00    | Concrete surfaces vary in age and condition. Some sections are severely worn or cracked and need to be replaced in the worn areas. |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 2230     | STORAGE SHEDS              | \$ 2,725.00  | The storage shed has 2 broken windows and needs pest infestation.                                                                  |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 4011     | WALL SURFACE - GWB         | \$ 100.00    | Some of the walls need to be repaired and refinished.                                                                              |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112          | 4031     | CARPET                     | \$ 2,221.00  | The carpet is worn, frayed and stained and needs to be replaced.                                                                   |

| Site Name            | Site / Building                                                       | System # | System Name                                                      | Repair Amt   | Comment                                                                                                                                                                                |
|----------------------|-----------------------------------------------------------------------|----------|------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112               | 4070     | CASEWORK                                                         | \$ 923.00    | The finishing on the kitchen counter is not repairable. The countertop wiring is varies in age and portion. Though no major issues at this time, inspector suggested                   |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112               | 4230     | ELECTRICAL PANEL & WIRING                                        | \$ 6,921.00  |                                                                                                                                                                                        |
| Butte Falls Hatchery | Building - Residence 4 (1948) - Building # : BtFH-15113               |          |                                                                  |              |                                                                                                                                                                                        |
| Butte Falls Hatchery | Building - Residence 4 (1948) - Building # : BtFH-15113               | 4011     | WALL SURFACE - GWB                                               | \$ 234.00    | The GWB surface is weathered and needs to be repainted.                                                                                                                                |
| Butte Falls Hatchery | Building - Residence 4 (1948) - Building # : BtFH-15113               | 4032     | WOOD FLOORS                                                      | \$ 100.00    | The interior wood floors are worn and need to be refinished and repainted.                                                                                                             |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     |          |                                                                  |              |                                                                                                                                                                                        |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     | 2050     | WOOD, VINYL, OR ALUM WALLS                                       | \$ 672.00    | The paint is peeling in isolated areas and needs to be scraped and repainted.                                                                                                          |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     | 2240     | GARAGE                                                           | \$ 4,248.00  | The garage door needs a new spring. The hardware needs to be replaced. The garage interior walls are in need of repair. The walls upstairs are poorly finished. Retaped, sand          |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     | 4011     | WALL SURFACE - GWB                                               | \$ 1,270.00  |                                                                                                                                                                                        |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     | 4023     | CEILING SURFACES - GWB                                           | \$ 247.00    | The upstairs ceiling surface is poor and needs to be retaped, sanded and repainted. 100 amp service to the house box needed. The breaker for the water heater needs a possible upgrade |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                     | 4230     | ELECTRICAL PANEL & WIRING                                        | \$ 109.00    |                                                                                                                                                                                        |
| Cedar Creek Hatchery | Site - Cedar Creek Hatchery - Site # : CDCH                           |          |                                                                  |              |                                                                                                                                                                                        |
| Cedar Creek Hatchery | Site - Cedar Creek Hatchery - Site # : CDCH                           | 1410     | METAL VALVES - SMALL 2-6"                                        | \$ 2,100.00  | Valves are leaking and should be replaced.                                                                                                                                             |
| Cedar Creek Hatchery | Site - Cedar Creek Hatchery - Site # : CDCH                           | 1411     | METAL VALVES - MEDIUM 7-11"                                      | \$ 14,250.00 | Valves are leaking and should be replaced.                                                                                                                                             |
| Cedar Creek Hatchery | Site - Cedar Creek Hatchery - Site # : CDCH                           | 1412     | METAL VALVES - LARGE 12-18"                                      | \$ 15,000.00 | Valves are leaking and should be replaced.                                                                                                                                             |
| Cedar Creek Hatchery | Site - Cedar Creek Hatchery - Site # : CDCH                           | 1413     | METAL VALVES - X-LARGE >18"                                      | \$ 5,000.00  | Valves are leaking and should be replaced.                                                                                                                                             |
| Cedar Creek Hatchery | Building - Utility Building (1950) - Building # : CDCH-29229          |          |                                                                  |              |                                                                                                                                                                                        |
| Cedar Creek Hatchery | Building - Utility Building (1950) - Building # : CDCH-29229          | 2150     | SMALL WINDOWS (<15)                                              | \$ 897.00    | Four small windows need to be replaced.                                                                                                                                                |
| Cedar Creek Hatchery | Building - Utility Building (1950) - Building # : CDCH-29229          | 2171     | WOOD DOORS                                                       | \$ 348.00    | Exterior door needs to be rehung.                                                                                                                                                      |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239                         |          |                                                                  |              |                                                                                                                                                                                        |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239                         | 2151     | MEDIUM WINDOWS (15>30 SF)                                        | \$ 1,200.00  | Three windows need to be reglazed.                                                                                                                                                     |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239                         | 2171     | WOOD DOORS                                                       | \$ 695.00    | Rehang to function properly in frame.                                                                                                                                                  |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239                         | 4022     | CEILING SURFACES - ADHERED TILES                                 | \$ 1,625.00  | 40% of the wood ceiling panels are missing and need to be replaced.                                                                                                                    |
| Cedar Creek Hatchery | Building - Garage/Shed/Shop @ Rhodes (1978) - Building # : CDCH-29255 |          | Rhodes Pond garage/shed building has been abandoned for 10 years |              | Decision has been made to demolish building.                                                                                                                                           |
| Cedar Creek Hatchery | Building - Residence (prefab) (1947) - Building # : CDCH-29273        |          |                                                                  |              |                                                                                                                                                                                        |

| Site Name               | Site / Building                                                                 | System # | System Name                                            | Repair Amt    | Comment                                                                             |
|-------------------------|---------------------------------------------------------------------------------|----------|--------------------------------------------------------|---------------|-------------------------------------------------------------------------------------|
| Cedar Creek Hatchery    | Building - Residence (prefab) (1947) - Building # : CDCH-29273                  | 2050     | WOOD, VINYL, OR ALUM WALLS                             | \$ 578.00     | The wood siding needs minor repair. Replace and re-install damaged g sections.      |
| Cedar Creek Hatchery    | Building - Residence (prefab) (1947) - Building # : CDCH-29273                  | 2141     | ROOF DRAINAGE - EXTERIOR                               | \$ 100.00     | One exterior door needs to be re-h in the frame.                                    |
| Cedar Creek Hatchery    | Building - Residence (prefab) (1947) - Building # : CDCH-29273                  | 2171     | WOOD DOORS                                             | \$ 348.00     | One storm door is missing hardware screen.                                          |
| Cedar Creek Hatchery    | Building - Residence (prefab) (1947) - Building # : CDCH-29273                  | 2174     | STORM / SCREEN DOORS                                   | \$ 278.00     |                                                                                     |
| Cedar Creek Hatchery    | Building - Residence Manager's (1924) - Building # : CDCH-29274                 |          |                                                        |               |                                                                                     |
| Cedar Creek Hatchery    | Building - Residence Manager's (1924) - Building # : CDCH-29274                 | 2020     | BASEMENT / 8 FT FOUNDATION                             | \$ 27,691.00  | Foundation walls are leaking and r                                                  |
| Cedar Creek Hatchery    | Building - Residence Manager's (1924) - Building # : CDCH-29274                 | 2190     | EXTERIOR STAIRS - CONCRETE                             | \$ 373.00     | Concrete is spalling at exterior sta                                                |
| Cedar Creek Hatchery    | Building - Residence @ Rhodes Pond (1978) - Building # : CDCH-29276             |          | Rhoades Pond residence has been abandoned for 10 years |               | Decision has been made to conde building.                                           |
| Cedar Creek Hatchery    | Building - Residential Mobile Home-Silvercrest (1983) - Building # : CDCH-29277 |          |                                                        |               |                                                                                     |
| Elk River Hatchery      | Site - Elk River Hatchery - Site # : ElkRH                                      |          |                                                        |               |                                                                                     |
| Elk River Hatchery      | Site - Elk River Hatchery - Site # : ElkRH                                      | 1050     | PAVED VEHICLE SURFACES - ASPHALT                       | \$ 109,998.00 | The asphalt throughout the site is many areas that need to be totally the asphalt n |
| Elk River Hatchery      | Site - Elk River Hatchery - Site # : ElkRH                                      | 1052     | PAVED VEHICLE SURFACES - GRAVEL                        | \$ 1,116.00   | A portion of the gravel road has ru with gravel and compacted.                      |
| Elk River Hatchery      | Site - Elk River Hatchery - Site # : ElkRH                                      | 1260     | DOMESTIC WATER LINES                                   | \$ 16,341.00  | The underground piping is original have been found throughout. At le replaced.      |
| Elk River Hatchery      | Building - Residence 1 - Building # : ElkRH-08072                               |          |                                                        |               |                                                                                     |
| Elk River Hatchery      | Building - Residence 1 - Building # : ElkRH-08072                               | 2050     | WOOD, VINYL, OR ALUM WALLS                             | \$ 1,634.00   | A small portion of the exterior wall be replaced.                                   |
| Elk River Hatchery      | Building - Residence 1 - Building # : ElkRH-08072                               | 2060     | FLOOR INSULATION                                       | \$ 2,780.00   | Most of the house had floor insula The portion that did not needs insu              |
| Elk River Hatchery      | Building - Residence 1 - Building # : ElkRH-08072                               | 2173     | GLASS SLIDING DOORS                                    | \$ 300.00     | Entire door should be replaced wit framed sliding door assembly.                    |
| Elk River Hatchery      | Building - Residence 1 - Building # : ElkRH-08072                               | 4031     | CARPET AND PAD                                         | \$ 1,094.00   | A portion of the carpeting is staine replaced.                                      |
| Millicoma Facility STEP |                                                                                 |          |                                                        |               |                                                                                     |
| Millicoma Facility STEP | Building - Office/Bathroom/Spawning/Storage(1992) - Building # : Milli-06510    |          |                                                        |               |                                                                                     |

| Site Name                 | Site / Building                                                              | System # | System Name                      | Repair Amt    | Comment                                                                                         |
|---------------------------|------------------------------------------------------------------------------|----------|----------------------------------|---------------|-------------------------------------------------------------------------------------------------|
| Millicoma Facility STEP   | Building - Office/Bathroom/Spawning/Storage(1992) - Building # : Milli-06510 | 2220     | DECKS WITH RAILING               | \$ 288.00     | The transition from the wood ramp is pulling up and the wood planks. Currently the              |
| Millicoma Facility STEP   | Building - Office/Bathroom/Spawning/Storage(1992) - Building # : Milli-06510 | 4011     | WALL SURFACE - GWB               | \$ 523.00     | The painted sheetrock walls in the peeling/scratched and need to be                             |
| Millicoma Facility STEP   | Building - Shop (1996) - Building # : Milli-06514                            |          |                                  |               |                                                                                                 |
| Millicoma Facility STEP   | Building - Shop (1996) - Building # : Milli-06514                            | 2171     | WOOD DOORS                       | \$ 695.00     | The wood doors need to be painted hinges also need to be replaced.                              |
| Morgan Creek Hatch-STEP   | Site - Morgan Creek Hatch-STEP - Site # : MrgCH                              |          |                                  |               |                                                                                                 |
| Morgan Creek Hatch-STEP   | Site - Morgan Creek Hatch-STEP - Site # : MrgCH                              | 1061     | PAVED WALKS/SURFACES - CONCRETE  | \$ 100.00     | A percentage of the concrete walk needs to be replaced.                                         |
| Morgan Creek Hatch-STEP   | Site - Morgan Creek Hatch-STEP - Site # : MrgCH                              | 1410     | METAL VALVES - SMALL 2-6"        | \$ 600.00     | The one valve on the site is damaged                                                            |
| Morgan Creek Hatch-STEP   | Building - Spawn/Storage/Office - Building # : MrgCH-06526                   |          |                                  |               |                                                                                                 |
| Morgan Creek Hatch-STEP   | Building - Spawn/Storage/Office - Building # : MrgCH-06526                   | 4023     | CEILING SURFACES - GWB           | \$ 106.00     | The gypsum ceiling in the Spawning and peeling paint. The surface needs                         |
| Noble Creek Hatchery-STEP | Building - Hatchery/Spawning (1989) - Building # : NblCH-06540               |          |                                  |               |                                                                                                 |
| Noble Creek Hatchery-STEP | Building - Hatchery/Spawning (1989) - Building # : NblCH-06540               | 2150     | SMALL WINDOWS (<15)              | \$ 1,157.00   | A percentage of the window frames to be replaced.                                               |
| Noble Creek Hatchery-STEP | Building - Hatchery/Spawning (1989) - Building # : NblCH-06540               | 4023     | CEILING SURFACES - GWB           | \$ 465.00     | Gypsum Ceiling is scuffed and peeling needs to be repainted.                                    |
| North Nehalem Hatchery    | Site - North Nehalem Hatchery - Site # : NNH                                 |          |                                  |               |                                                                                                 |
| North Nehalem Hatchery    | Site - North Nehalem Hatchery - Site # : NNH                                 | 1050     | PAVED VEHICLE SURFACES - ASPHALT | \$ 79,580.00  | Asphalt paving shows considerable evidence of repaired potholes, cracks. The site needs to      |
| North Nehalem Hatchery    | Site - North Nehalem Hatchery - Site # : NNH                                 | 1400     | GRATING                          | \$ 888.00     | Grating shows signs of rust and corrosion needs to be removed and re-galvanized                 |
| North Nehalem Hatchery    | Site - North Nehalem Hatchery - Site # : NNH                                 | 1420     | REARING RACEWAY - CONCRETE       | \$ 270,176.00 | Concrete has settled and cracked. Needs to be replaced.                                         |
| North Nehalem Hatchery    | Building - Service Building w/Freezer Room (1966) - Building # : NNH-04070   |          |                                  |               |                                                                                                 |
| North Nehalem Hatchery    | Building - Service Building w/Freezer Room (1966) - Building # : NNH-04070   | 2081     | ASPHALT OR FIBERGLASS SHINGLES   | \$ 1,609.00   | A portion of the asphalt shingles are evidence of water infiltration. They need to be replaced. |
| North Nehalem Hatchery    | Building - Service Building w/Freezer Room (1966) - Building # : NNH-04070   | 4023     | CEILING SURFACES - GWB           | \$ 100.00     | Repair and replace damaged ceiling                                                              |

| Site Name              | Site / Building                                                            | System # | System Name                      | Repair Amt   | Comment                                                                                                                                                    |
|------------------------|----------------------------------------------------------------------------|----------|----------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| North Nehalem Hatchery | Building - Service Building w/Freezer Room (1966) - Building # : NNH-04070 | 4210     | LIGHTING FIXTURES                | \$ 171.00    | Replace non-functional lighting fixtures                                                                                                                   |
| North Nehalem Hatchery | Building - Shop/Storage Building (1968) - Building # : NNH-04072           |          |                                  |              |                                                                                                                                                            |
| North Nehalem Hatchery | Building - Shop/Storage Building (1968) - Building # : NNH-04072           | 2081     | ASPHALT OR FIBERGLASS SHINGLES   | \$ 7,586.00  | The shingles are worn or missing, causing leaks. The roof needs to be replaced.                                                                            |
| North Nehalem Hatchery | Building - Shop/Storage Building (1968) - Building # : NNH-04072           | 2141     | ROOF DRAINAGE - EXTERIOR         | \$ 328.00    | Sections of the gutter need to be reconnected.                                                                                                             |
| North Nehalem Hatchery | Building - Shop/Storage Building (1968) - Building # : NNH-04072           | 2150     | SMALL WINDOWS (<15)              | \$ 224.00    | Repair and repaint frames, reglaze                                                                                                                         |
| Rock Creek Hatchery    |                                                                            |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | 1050     | PAVED VEHICLE SURFACES - ASPHALT | \$ 520.00    | A small percentage of the vehicle surfaces are cracked and needs to be resealed due to deterioration                                                       |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | 1060     | PAVED WALKS/SURFACES - ASPHALT   | \$ 450.00    | A large portion of the walkway asphalt is cracked and needs to be replaced. The observation deck is cracked substantially.                                 |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | 1410     | METAL VALVES - SMALL 2-6"        | \$ 31,200.00 | All of the small valves serving the raceways are damaged and need replacing. The valves are rusting                                                        |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | 1413     | METAL VALVES - X-LARGE >18"      | \$ 4,800.00  | A 3' weir wheel valve is broken and needs to be replaced                                                                                                   |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | 1420     | REARING RACEWAY - CONCRETE       | \$ 20,948.00 | One portion of the raceways was broken and showing signs of its age. The concrete needs to be replaced and the aggregate                                   |
| Rock Creek Hatchery    | Building - Residence (1957) - Building # : RCH-10091                       |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Residence (1948) - Building # : RCH-10092                       |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Residence 4 (1949) - Building # : RCH-10093                     |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Residence 4 (1949) - Building # : RCH-10093                     | 2190     | EXTERIOR STAIRS - CONCRETE       | \$ 261.00    | A portion of the concrete stairs is cracked and needs to be repaired.                                                                                      |
| Rock Creek Hatchery    | Building - Residence 5 (1948) - Building # : RCH-10094                     |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Residence 1 (1962) - Building # : RCH-10095                     |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Hatchery Building (1948) - Building # : RCH-10140               |          |                                  |              |                                                                                                                                                            |
| Rock Creek Hatchery    | Building - Hatchery Building (1948) - Building # : RCH-10140               | 4011     | WALL SURFACE - GWB               | \$ 452.00    | Walls have experienced extreme aging and need to be repainted.                                                                                             |
| Rock Creek Hatchery    | Building - Hatchery Building (1948) - Building # : RCH-10140               | 4032     | WOOD FLOORS                      | \$ 770.00    | The wood floors in the upstairs office area are worn. Most of the paint has chipped away and needs to be replaced. 100% of the floor needs to be replaced. |
| Rock Creek Hatchery    | Building - Hatchery Building (1948) - Building # : RCH-10140               | 4040     | DOORS & FRAMES                   | \$ 891.00    | Several doors need their hardware replaced. Doors and frames (2) in incubator need to be repainted.                                                        |



| Site Name             | Site / Building                                                       | System # | System Name                           | Repair Amt    | Comment                                                                                   |
|-----------------------|-----------------------------------------------------------------------|----------|---------------------------------------|---------------|-------------------------------------------------------------------------------------------|
| Salmon River Hatchery |                                                                       |          |                                       |               |                                                                                           |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           |          |                                       |               |                                                                                           |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1050     | PAVED VEHICLE SURFACES - ASPHALT      | \$ 32,080.00  | Driveway is damaged and needs to be replaced.                                             |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1061     | PAVED WALKS/SURFACES - CONCRETE       | \$ 343.00     | Sections of the concrete walk are cracked and need to be replaced.                        |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1201     | DRAINAGE - SURFACE RUNOFF             | \$ 4,536.00   | The surface runoff at the site is inadequate and a drainage system needs to be installed. |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1410     | METAL VALVES - SMALL 2-6"             | \$ 5,488.00   | Valve seals are leaking and need to be replaced.                                          |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1411     | METAL VALVES - MEDIUM 7-11"           | \$ 100.00     | Valve seals are leaking and need to be replaced.                                          |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1412     | METAL VALVES - LARGE 12-18"           | \$ 458.00     | Valve seals are leaking and need to be replaced.                                          |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                           | 1420     | REARING RACEWAY - CONCRETE            | \$ 113,449.00 | Expansion joint filler needs to be replaced. Concrete is cracked and needs to be patched. |
| Salmon River Hatchery | Building - Residence (1975) - Building # : SRH-21209                  |          |                                       |               |                                                                                           |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 |          |                                       |               |                                                                                           |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 2050     | WOOD, VINYL, OR ALUM WALLS            | \$ 1,276.00   | Wood siding is weathered and needs to be replaced/repainted.                              |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 2150     | SMALL WINDOWS (<15)                   | \$ 551.00     | Three small windows need to be replaced.                                                  |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 2170     | METAL DOORS                           | \$ 1,092.00   | Four doors need to be re-hung to original frames.                                         |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 2210     | BUILDING MOUNTED EXTERIOR SITE LIGHTS | \$ 1,490.00   | Repair or replace two non-functioning lights.                                             |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4011     | WALL SURFACE - GWB                    | \$ 485.00     | Repair and repaint damaged walls.                                                         |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4023     | CEILING SURFACES - GWB                | \$ 417.00     | Stained ceiling panels need to be replaced or to be retaped.                              |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4033     | RESILIENT FLOORING                    | \$ 3,252.00   | Replace resilient flooring in office area.                                                |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4040     | DOORS & FRAMES                        | \$ 297.00     | One door is missing hardware.                                                             |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4070     | CASEWORK                              | \$ 417.00     | Countertop needs to be repaired.                                                          |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4111     | ELECTRIC RADIATION                    | \$ 1,280.00   | One unit heater needs to be replaced.                                                     |
| Salmon River Hatchery | Building - Hatchery/Office/Apt./Freezer/Shop - Building # : SRH-21210 | 4210     | LIGHTING FIXTURES                     | \$ 1,666.00   | Replace non-functional fixture.                                                           |

| Site Name             | Site / Building                                                          | System # | System Name                                      | Repair Amt   | Comment                                                                                  |
|-----------------------|--------------------------------------------------------------------------|----------|--------------------------------------------------|--------------|------------------------------------------------------------------------------------------|
| Salmon River Hatchery | Building - Residence Mobile Home Camelot (1978) - Building # : SRH-21215 |          |                                                  |              |                                                                                          |
| Salmon River Hatchery | Building - Residence Mobile Home Camelot (1978) - Building # : SRH-21215 | 2171     | WOOD DOORS                                       | \$ 765.00    | Exterior door needs to be re-hung the frame.                                             |
| Salmon River Hatchery | Building - Residence Mobile Home Camelot (1978) - Building # : SRH-21215 | 2192     | EXTERIOR STAIRS - WOOD                           | \$ 115.00    | Treads are worn and need to be re                                                        |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  |          |                                                  |              |                                                                                          |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1050     | PAVED VEHICLE SURFACES - ASPHALT                 | \$ 82,930.00 | The asphalt surface is showing sig alligating. The base appears to condition. The damage |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1300     | SANITARY PUMPS                                   | \$ 964.00    | The sanitary pump sporadically ma maintenance issue.                                     |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1410     | METAL VALVES - SMALL 2-6"                        | \$ 3,000.00  | The valves are corroding and leak believes replacement is necessary                      |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1411     | METAL VALVES - MEDIUM 7-11"                      | \$ 12,000.00 | The valves are corroding and leak believes replacement is necessary                      |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1412     | METAL VALVES - LARGE 12-18"                      | \$ 5,025.00  | The valves are corroding and leak believes replacement is necessary                      |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1420     | REARING RACEWAY - CONCRETE                       | \$ 91,300.00 | The raceway concrete is cracking to be replaced.                                         |
| Trask Hatchery        | Site - Trask Hatchery - Site # : TraskH                                  | 1432     | SETTLING PONDS - EARTH                           | \$ 7,500.00  | The earth settling pond is not func to be replaced or a membrane line                    |
| Trask Hatchery        | Building - Residence #2 (1950) - Building # : TraskH-29283               |          |                                                  |              |                                                                                          |
| Trask Hatchery        | Building - Residence #2 (1950) - Building # : TraskH-29283               | 2240     | GARAGE                                           | \$ 4,248.00  | The roof, siding and door to the ga The garage needs to be repaired a                    |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               |          |                                                  |              |                                                                                          |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 2050     | WOOD, VINYL, OR ALUM WALLS ASPHALT OR FIBERGLASS | \$ 229.00    | The rake boards are deteriorating.                                                       |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 2081     | SHINGLES                                         | \$ 168.00    | The sheathing is deteriorating and                                                       |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 2180     | EXTERIOR COVERED AREAS                           | \$ 3,604.00  | The roof is leaking at the covered The siding is damaged and needs repaired/repainted.   |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 2240     | GARAGE                                           | \$ 2,124.00  |                                                                                          |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 4011     | WALL SURFACE - GWB                               | \$ 117.00    | Repair and repaint minor wall dam                                                        |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 4023     | CEILING SURFACES - GWB                           | \$ 100.00    | Repair and repaint minor ceiling d                                                       |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 4031     | CARPET                                           | \$ 1,796.00  | The carpeting in the back room ne                                                        |
| Trask Hatchery        | Building - Residence #3 (1950) - Building # : TraskH-29284               | 4040     | DOORS & FRAMES                                   | \$ 297.00    | The door needs to be re-hung to fu frame.                                                |
| Trask Hatchery        | Building - Hatchery (1977) - Building # : TraskH-29290                   |          |                                                  |              |                                                                                          |
| Site Name             | Site / Building                                                          | System # | System Name                                      | Repair Amt   | Comment                                                                                  |

|                     |                                                                              |      |                                 |    |           |                                                                                    |
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| Trask Hatchery      | Building - Hatchery (1977) - Building # : TraskH-29290                       | 2150 | SMALL WINDOWS (<15)             | \$ | 897.00    | The windows need to be reglazed, repainted.                                        |
| Trask Hatchery      | Building - Hatchery (1977) - Building # : TraskH-29290                       | 4011 | WALL SURFACE - GWB              | \$ | 100.00    | Repair and repaint minor wall damage.                                              |
| Trask Hatchery      | Building - Hatchery (1977) - Building # : TraskH-29290                       | 4033 | RESILIENT FLOORING              | \$ | 1,972.00  | The flooring in the office, change new worn and needs to be replaced.              |
| Trask Hatchery      | Building - Hatchery (1977) - Building # : TraskH-29290                       | 4040 | DOORS & FRAMES                  | \$ | 594.00    | The door needs to be re-hung to function in frame.                                 |
| Trask Hatchery      | Building - Storage House @ Upper Hatchery (1950) - Building # : TraskH-29306 |      |                                 |    |           |                                                                                    |
| Trask Hatchery      | Building - Storage House @ Upper Hatchery (1950) - Building # : TraskH-29306 | 2100 | CHIMNEYS                        | \$ | 360.00    | The chimney needs to be repaired.                                                  |
| Trask Hatchery      | Building - Storage House @ Upper Hatchery (1950) - Building # : TraskH-29306 | 2141 | ROOF DRAINAGE - EXTERIOR        | \$ | 120.00    | Clean, repair and reattach non-functioning gutters.                                |
| Trask Hatchery      | Building - Storage House @ Upper Hatchery (1950) - Building # : TraskH-29306 | 2171 | WOOD DOORS                      | \$ | 850.00    | Rehang door to function in frame.                                                  |
| Trask Hatchery      | Building - Freezer/Thawing Building (1989) - Building # : TraskH-29324       |      |                                 |    |           |                                                                                    |
| Trask Hatchery      | Building - Freezer/Thawing Building (1989) - Building # : TraskH-29324       | 4011 | WALL SURFACE - GWB              | \$ | 230.00    | Repair and repaint minor wall damage.                                              |
| Trask Hatchery      | Building - Shed Spawning @ Upper Pond (1985) - Building # : TraskH-29330     |      |                                 |    |           |                                                                                    |
| Trask Hatchery      | Building - Shed Spawning @ Upper Pond (1985) - Building # : TraskH-29330     | 2081 | ASPHALT OR FIBERGLASS SHINGLES  | \$ | 100.00    | Replace missing shingles.                                                          |
| Trask Hatchery      | Building - Shed Spawning @ Upper Pond (1985) - Building # : TraskH-29330     | 2141 | ROOF DRAINAGE - EXTERIOR        | \$ | 100.00    | Portion of the gutters is damaged and gutters need to be repaired.                 |
| Trask Rearing Ponds |                                                                              |      |                                 |    |           |                                                                                    |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 |      |                                 |    |           |                                                                                    |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 | 1052 | PAVED VEHICLE SURFACES - GRAVEL | \$ | 4,302.00  | The road has potholes and ruts and needs to be filled/compacted.                   |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 | 1410 | METAL VALVES - SMALL 2-6"       | \$ | 1,172.00  | The metal valves can no longer be used and need to be replaced.                    |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 | 1412 | METAL VALVES - LARGE 12-18"     | \$ | 1,800.00  | The metal valves can no longer be used and need to be replaced.                    |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 | 1420 | REARING RACEWAY - CONCRETE      | \$ | 30,000.00 | Elk damaged the membrane in the raceway and it is now empty. Replace the membrane. |
| Trask Rearing Ponds | Site - Trask Rearing Ponds - Site # : TraskP                                 | 1432 | SETTLING PONDS - EARTH          | \$ | 8,050.00  | Settling pond is in poor condition and needs to be lined with membrane.            |
| Trask Rearing Ponds | Building - Refrigerator Shed & Slab (1965) - Building # : TraskP-29344       |      |                                 |    |           |                                                                                    |

| Site Name | Site / Building | System # | System Name | Repair Amt | Comment |
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|----------------------|--------------------------------------------------------------------------------|------|-------------------------------------|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trask Rearing Ponds  | Building - Refrigerator Shed & Slab (1965) - Building # : TraskP-29344         | 2083 | METAL ROOF                          | \$ | 127.00   | Metal roof is leaking and needs to                                                                                                                                           |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                |      |                                     |    |          |                                                                                                                                                                              |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 2050 | WOOD, VINYL, OR ALUM WALLS          | \$ | 2,277.00 | There is weather damage to the w<br>Approximately 40% of the siding n<br>and painted.<br>Numerous shingles are missing an<br>water damage to the ceiling inside<br>replaced. |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 2081 | ASPHALT OR FIBERGLASS<br>SHINGLES   | \$ | 5,415.00 | The gutter and leader components<br>need to be replaced.                                                                                                                     |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 2141 | ROOF DRAINAGE - EXTERIOR            | \$ | 314.00   | The glazing and framing are sever<br>to be replaced.                                                                                                                         |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 2150 | SMALL WINDOWS (<15)                 | \$ | 1,157.00 | Covered storage leaks and shows<br>deterioration. The covered storag                                                                                                         |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 2180 | EXTERIOR COVERED AREAS              | \$ | 3,211.00 | The particle board finish has exper<br>and needs to be replaced.                                                                                                             |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 4013 | WALL SURFACE - WOOD PANELING        | \$ | 2,435.00 | The particle board finish has exper<br>and needs to be replaced.                                                                                                             |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 4023 | CEILING SURFACES - GWB              | \$ | 960.00   | Floor is damaged and needs to be                                                                                                                                             |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 4032 | WOOD FLOORS                         | \$ | 392.00   | Casework is worn/damaged and n                                                                                                                                               |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 4070 | CASEWORK                            | \$ | 3,574.00 | Dysfunctional light fixtures need to                                                                                                                                         |
| Trask Rearing Ponds  | Building - Garage and Office (1970) - Building # : TraskP-29345                | 4210 | LIGHTING FIXTURES                   | \$ | 927.00   |                                                                                                                                                                              |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 |      |                                     |    |          |                                                                                                                                                                              |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 | 2050 | WOOD, VINYL, OR ALUM WALLS          | \$ | 484.00   | There is damage to the lower sidin<br>The siding needs to be repaired/re<br>Ceiling tiles have experienced wat<br>be replaced. (Water infiltrated roof<br>repaired).         |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 | 4022 | CEILING SURFACES - ADHERED<br>TILES | \$ | 532.00   | Replace living room carpet.                                                                                                                                                  |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 | 4031 | CARPET                              | \$ | 2,106.00 | Replace kitchen and bathroom res                                                                                                                                             |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 | 4033 | RESILIENT FLOORING                  | \$ | 1,554.00 | Doors need to be re-hung and fran<br>repaired.                                                                                                                               |
| Trask Rearing Ponds  | Building - Residence Mobile Home Mcminville (1986) - Building # : TraskP-29347 | 4040 | DOORS & FRAMES                      | \$ | 817.00   |                                                                                                                                                                              |
| Tuffy Creek Hatchery | Site - Tuffy Creek Hatchery - Site # : TfyCrH                                  |      |                                     |    |          |                                                                                                                                                                              |
| Tuffy Creek Hatchery | Site - Tuffy Creek Hatchery - Site # : TfyCrH                                  | 1260 | WATER LINES                         | \$ | 711.00   | The water lines are damaged at th<br>need to be repaired.                                                                                                                    |
| Tuffy Creek Hatchery | Building - Incubation Building (1990) - Building # : TfyCrH-29559              |      |                                     |    |          |                                                                                                                                                                              |

| Site Name | Site / Building | System # | System Name | Repair Amt | Comment |
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|----------------------|-------------------------------------------------------------------|------|------------|-----------------------|----------------------------------------------------------------------|
| Tuffy Creek Hatchery | Building - Incubation Building (1990) - Building # : TfyCrH-29559 | 2171 | WOOD DOORS | \$ 348.00             | The door to the incubation building functions properly in the frame. |
| <b>Total</b>         |                                                                   |      |            | <b>\$1,665,344.00</b> |                                                                      |

**Table 88. Deferred maintenance - health and safety items only.**

| Site Name            | Site / Building                                                              | System # | System Name                     | Repair Amt         | Comment                                                                                                                                                                                                                               |
|----------------------|------------------------------------------------------------------------------|----------|---------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Butte Falls Hatchery | Building - Storage/Wood Shop Building (1937) - Building # : BtFH-15034       | 2240     | GARAGE                          | \$46,209.00        | The 3 car garage on the end, building #15033, is failing. A tree root has broken the foundation and the structure is unsafe. The entire structure needs to be replaced.                                                               |
| Butte Falls Hatchery | Building - Residence 2 (1936) - Building # : BtFH-15112                      | 4230     | ELECTRICAL PANEL & WIRING       | \$6,921.00         | Wiring is varies in age and portions are not grounded. Though no major issues at this time the electrical inspector suggested the house be re-wired.                                                                                  |
| Butte Falls Hatchery | Building - Residence #5 - Building # : BtFH-15114                            | 4230     | ELECTRICAL PANEL & WIRING       | \$109.00           | 100 amp service to the house box is located in the garage. The breaker for the water heater trips randomly. Possible upgrade needed, however a further research needs be performed to confirm what action is necessary.               |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                  | 1061     | PAVED WALKS/SURFACES - CONCRETE | \$755.00           | Portions of the older pathways are cracking due to tree root systems. Replace the cracked sections that pose tripping hazard and/or weathered sections.                                                                               |
| Millicoma Facility   | Building - Office/Bathroom/Spawning/Storage(1992) - Building # : Milli-06510 | 2220     | DECKS WITH RAILING              | \$ 288.00          | The transition from the wood ramp to the asphalt sidewalk is pulling up and the wood planks need to be replaced. Currently the lip is a safety hazard and an ADA issue. A portion of the railing is also damaged and needs replacing. |
|                      |                                                                              |          | <b>TOTAL</b>                    | <b>\$54,282.00</b> |                                                                                                                                                                                                                                       |

**Table 89. Deferred maintenance - high priority items only**

| Site Name            | Site / Building                                                                    | System # | System Name                       | Repair Amt  | Comment                                                                                                                         |
|----------------------|------------------------------------------------------------------------------------|----------|-----------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| Alsea Hatchery       | Building - Residence 1 (1948) - Building # : AlSH-02001                            | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$2,621.00  | The eaves are dry rotting and need to be replaced/repaired accordingly. 100% of the wood siding needs to be scraped and repaint |
| Alsea Hatchery       | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002                     | 2010     | CRAWL SPACE / 4 FT FOUNDATION     | \$4,925.00  | The floor joists are rotted and need to be replaced.                                                                            |
| Alsea Hatchery       | Building - Residence 2 5Rooms (1934) - Building # : AlSH-02002                     | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$547.00    | Part of the eaves are dry rotted and need to be replaced.                                                                       |
| Alsea Hatchery       | Building - Residence w/3 Bdrm + Garage (1962) - Building # : AlSH-02004            | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$2,856.00  | The wood walls need to be scraped and repainted. The eaves are dryrotted and the roof accessories keep falling off because of   |
| Alsea Hatchery       | Building - Garage Tank and Storage (1934) includes 02018 - Building # : AlSH-02011 | 2050     | WOOD, VINYL, OR ALUM WALLS        | \$2,771.00  | The entire building needs to scraped and repainted.                                                                             |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH                                             | 1290     | SANITARY LINES                    | \$1,200.00  | The lines are deteriorating and need to be replaced.                                                                            |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH                                             | 1420     | REARING RACEWAY - CONCRETE        | \$15,577.00 | Some of the concrete walls and floors of the raceways are cracked and need to be patched.                                       |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1050     | PAVED VEHICLE SURFACES - ASPHALT  | \$640.00    | The asphalt surfaces in the driveways are worn and cracking and need to be resurfaced.                                          |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1051     | PAVED VEHICLE SURFACES - CONCRETE | \$2,382.00  | The concrete driveways were installed in sections over large spans of time. Some driveways are cracked and falling apart and a  |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1061     | PAVED WALKS/SURFACES - CONCRETE   | \$755.00    | Portions of the older pathways are cracking due to tree root systems. Replace the cracked sections that pose tripping hazard a  |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1191     | LANDSCAPE RETAINING WALL - WOOD   | \$10,994.00 | The railroad retaining wall Northwest of ponds 15005-15007 is rotting and falling apart and needs to be replaced.               |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1201     | DRAINAGE - SURFACE RUNOFF         | \$18,034.00 | In times of heavy rain, water runs down walkways of building 15112 and ponds in back yard.                                      |
| Butte Falls Hatchery | Site - Butte Falls Hatchery - Site # : BtFH                                        | 1260     | WATER LINES                       | \$31,677.00 | There are major problems with the old piping, including frequent leaks. The damaged portions of the piping need to be replaced  |

| Site Name              | Site / Building                                                  | System # | System Name                 | Repair Amt   | Comment                                                                                                                        |
|------------------------|------------------------------------------------------------------|----------|-----------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------|
| Butte Falls Hatchery   | Site - Butte Falls Hatchery - Site # : BtFH                      | 1420     | REARING RACEWAY - CONCRETE  | \$59,376.00  | The majority of the raceways are useable but extremely degraded. The concrete is chipping and crumbling and need to be patched |
| Butte Falls Hatchery   | Building - Office (3 room) (1937) - Building # : BtFH-15028      | 2040     | VERTICAL STRUCTURE          | \$1,170.00   | Building is leaning 2" to the back due to roots degrading the foundation. The structure needs to be reinforced and leveled out |
| Butte Falls Hatchery   | Building - Office (3 room) (1937) - Building # : BtFH-15028      | 4033     | RESILIENT FLOORING          | \$1,096.00   | The floor is chipped and the seams are pulling apart. It needs to be replaced.                                                 |
| Butte Falls Hatchery   | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 2171     | WOOD DOORS                  | \$695.00     | The paint is peeling off of the door. The door is also too small to drive a forklift through for loading and unloading food pa |
| Butte Falls Hatchery   | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 2221     | PATIOSWITHOUT ROOFS         | \$1,380.00   | Concrete pad in front of building is crumbling/falling apart and needs to be replaced.                                         |
| Butte Falls Hatchery   | Building - Cold Storage & Grinder Room - Building # : BtFH-15038 | 4011     | WALL SURFACE - GWB          | \$1,757.00   | The GWB walls in the grinder space need to be refinished. The paint and plaster are cracking and peeling off.                  |
| Butte Falls Hatchery   | Building - Residence 2 (1936) - Building # : BtFH-15112          | 2100     | CHIMNEYS                    | \$100.00     | The bricks are loose at the top of the chimney and need to be repaired/secured.                                                |
| Butte Falls Hatchery   | Building - Residence 2 (1936) - Building # : BtFH-15112          | 4230     | ELECTRICAL PANEL & WIRING   | \$6,921.00   | Wiring is varies in age and portions are not grounded. Though no major issues at this time the electrical inspector suggested  |
| Butte Falls Hatchery   | Building - Residence #5 - Building # : BtFH-15114                | 4230     | ELECTRICAL PANEL & WIRING   | \$109.00     | 100 amp service to the house box is located in the garage. The breaker for the water heater trips randomly. Possible upgrade   |
| Cedar Creek Hatchery   | Site - Cedar Creek Hatchery - Site # : CDCH                      | 1411     | METAL VALVES - MEDIUM 7-11" | \$14,250.00  | Valves are leaking and should be replaced.                                                                                     |
| Cedar Creek Hatchery   | Site - Cedar Creek Hatchery - Site # : CDCH                      | 1412     | METAL VALVES - LARGE 12-18" | \$15,000.00  | Valves are leaking and should be replaced.                                                                                     |
| Cedar Creek Hatchery   | Site - Cedar Creek Hatchery - Site # : CDCH                      | 1413     | METAL VALVES - X-LARGE >18" | \$5,000.00   | Valves are leaking and should be replaced.                                                                                     |
| Elk River Hatchery     | Site - Elk River Hatchery - Site # : ElkrH                       | 1413     | METAL VALVES - X-LARGE >18" | \$907.00     | One valve is damaged at the valve stem and is leaking. The valve stem needs to be repaired/replaced accordingly.               |
| North Nehalem Hatchery | Site - North Nehalem Hatchery - Site # : NNH                     | 1420     | REARING RACEWAY - CONCRETE  | \$270,176.00 | Concrete has settled and cracked. The concrete needs to be replaced.                                                           |



| Site Name             | Site / Building                                                                      | System # | System Name                            | Repair Amt          | Comment                                                                                                                         |
|-----------------------|--------------------------------------------------------------------------------------|----------|----------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Rock Creek Hatchery   | Site - Rock Creek Hatchery - Site # :<br>RCH                                         | 1060     | PAVED<br>WALKS/SURFACES<br>- ASPHALT   | \$450.00            | A large portion of the walkway asphalt area leading to the observation deck is cracked substantially and needs to be replaced.  |
| Rock Creek Hatchery   | Site - Rock Creek Hatchery - Site # :<br>RCH                                         | 1420     | REARING<br>RACEWAY -<br>CONCRETE       | \$20,948.00         | One portion of the raceways was built in the 1940's and is showing signs of its age. The concrete is cracking and the aggregate |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # :<br>SRH                                       | 1201     | DRAINAGE -<br>SURFACE RUNOFF           | \$4,536.00          | The surface runoff at the site is inadequate. A storm drainage system needs to be installed.                                    |
| Trask Hatchery        | Site - Trask Hatchery - Site # :<br>TraskH                                           | 1050     | PAVED VEHICLE<br>SURFACES -<br>ASPHALT | \$22,930.00         | The asphalt surface is showing signs of cracks and alligating. The base appears to be in satisfactory condition. The damage     |
| Trask Rearing Ponds   | Building - Residence Mobile Home<br>Mcminville (1986) - Building # :<br>TraskP-29347 | 2050     | WOOD, VINYL, OR<br>ALUM WALLS          | \$484.00            | There is damage to the lower siding and corner boards. The siding needs to be repaired/repainted.                               |
| Trask Rearing Ponds   | Building - Residence Mobile Home<br>Mcminville (1986) - Building # :<br>TraskP-29347 | 4022     | CEILING<br>SURFACES -<br>ADHERED TILES | \$532.00            | Ceiling tiles have experienced water damage and need to be replaced. (Water infiltrated roof, roof has since been repaired).    |
| Trask Rearing Ponds   | Building - Residence Mobile Home<br>Mcminville (1986) - Building # :<br>TraskP-29347 | 4031     | CARPET                                 | \$2,106.00          | Replace living room carpet.                                                                                                     |
| Trask Rearing Ponds   | Building - Residence Mobile Home<br>Mcminville (1986) - Building # :<br>TraskP-29347 | 4033     | RESILIENT<br>FLOORING                  | \$1,554.00          | Replace kitchen and bathroom resilient flooring.                                                                                |
| Trask Rearing Ponds   | Building - Residence Mobile Home<br>Mcminville (1986) - Building # :<br>TraskP-29347 | 4040     | DOORS & FRAMES                         | \$817.00            | Doors need to be re-hung and frames need to be repaired.                                                                        |
|                       |                                                                                      |          |                                        |                     |                                                                                                                                 |
|                       |                                                                                      |          | <b>TOTAL</b>                           | <b>\$527,793.00</b> |                                                                                                                                 |

## Appendix F. Proposed Modifications

**Table 90. Proposed modifications and maintenance items**

| Site Name            | Site / Building                               | System Name                                              | Repair Amt   | Comment                                                                                                                                                           |
|----------------------|-----------------------------------------------|----------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | ADA COMPLIANT WALKWAYS                                   | \$ 30,000.00 | Most of the existing walkways are narrow and unsafe.                                                                                                              |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | PUBLIC/EMPLOYEE RESTROOMS                                | \$ 75,000.00 | To include sinks for personal sanitation, sump, sewage pump and drainfield.                                                                                       |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | NOAA-APPROVED SCREENS FOR FERRY AND GEIGER CREEK INTAKES | \$ 7,000.00  | The existing aluminum screens are 1/8" mesh and need to be replaced with 3/32" mesh screens.                                                                      |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | WIDEN/REPAIR FERRY CREEK SPILLWAY                        | \$ 45,000.00 | This old spillway is in very poor condition. It isn't nearly wide enough and leaks. It was scheduled for replacement in 1965.                                     |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | ALUMINUM ADULT PEN DIVIDERS                              | \$ 40,000.00 | Existing ones are wood and in need of constant repair                                                                                                             |
| Bandon Hatchery      | Site - Bandon Hatchery - Site # : BndH        | PUMP SYSTEM FOR TREATING PONDS                           | \$ 8,000.00  | Bandon Hatchery needs a system to pump pond water with chemicals to an empty pond after treatment so that it can be metered slowly, thus meeting DEQ regulations. |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | PONDS                                                    | \$ 1,000.00  | Install gratings at outlet ends of Ponds 9, 10 & 11 a safety measure                                                                                              |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | PONDS                                                    | \$ 28,320.00 | Refurbish Ponds 9, 10 & 11 and level bottoms within 10-15 years                                                                                                   |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | PONDS                                                    | \$ 2,200.00  | Replace cleaning valve in Pond 9 within 1-5 years                                                                                                                 |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | PONDS                                                    | \$ 18,785.00 | Refurbish Ponds 2A and 8 and level bottoms within 5-10 years                                                                                                      |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | WATER LINES                                              | \$ 30,000.00 | Replace main water line from Hatchery Building within 5-10 years                                                                                                  |
| Cedar Creek Hatchery | Site – Cedar Creek Hatchery – Site # : CDCH   | WEIR                                                     | \$ 50,000.00 | Replace temporary wooden weir in Cedar Creek with permanent weir within 5-10 years                                                                                |
| Cedar Creek Hatchery | Building – Domestic Water Building            | ROOF                                                     | \$ 1,750.00  | Replace roof with metal roof within 1-5 years                                                                                                                     |
| Cedar Creek Hatchery | Building – Domestic Water Building            | ROOF DRAINAGE - EXTERIOR                                 | \$ 300.00    | Replace gutters within 1-5 years                                                                                                                                  |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239 | WINDOWS                                                  | \$ 3,795.00  | Replace with vinyl windows within 1-5 years                                                                                                                       |
| Cedar Creek Hatchery | Building - Hatchery - Building # : CDCH-29239 | WOOD, VINYL, OR ALUM WALLS                               | \$ 3,000.00  | Paint within 1-5 years                                                                                                                                            |

| Site Name              | Site / Building                                                            | System Name                | Repair Amt   | Comment                                                                                                                                                              |
|------------------------|----------------------------------------------------------------------------|----------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cedar Creek Hatchery   | Building - Hatchery - Building # : CDCH-29239                              | ROOF DRAINAGE - EXTERIOR   | \$ 513.00    | Replace gutters within 1-5 years                                                                                                                                     |
| Cedar Creek Hatchery   | Building - Hatchery - Building # : CDCH-29239                              | ROOF                       | \$ 8,280.00  | Replace with metal roof within 10-15 years                                                                                                                           |
| Cedar Creek Hatchery   | Building -Office Building (1950) - Building # : CDCH-29249                 | WINDOWS                    | \$ 1,171.00  | Replace with vinyl windows within 1-5 years                                                                                                                          |
| Cedar Creek Hatchery   | Building -Office Building (1950) - Building # : CDCH-29249                 | ROOF                       | \$ 2386.00   | Replace existing metal roof on lean-to within 1-5 years                                                                                                              |
| Cedar Creek Hatchery   | Building -Shop Building (1950) - Building # : CDCH-29229                   | WOOD, VINYL, OR ALUM WALLS | \$ 1,950.00  | Paint within 1-5 years                                                                                                                                               |
| Elk River Hatchery     | Site - Elk River Hatchery - Site # : ElkrH                                 | INTAKE PUMP                | \$ 12,000    | The pump seals are damaged and need to be repaired.                                                                                                                  |
| Elk River Hatchery     | Site - Elk River Hatchery - Site # : ElkrH                                 | EGG INCUBATOR STACKS       | \$ 65,000    | Old fiberglass incubators are deteriorating and need replacement.                                                                                                    |
| Elk River Hatchery     | Building - Residence 3 - Building # : ElkrH-08074                          | FLOOR INSULATION           | \$ 2,780.00  | Most of the house had floor insulation installed in 1993. The portion that did not needs insulation installed.                                                       |
| Elk River Hatchery     | Building - Residence 1 - Building # : ElkrH-08072                          | ROOF                       | \$ 12,000    | Roofing needs replacing due to storm damage and moos growth                                                                                                          |
| Elk River Hatchery     | Building - Residence 3 - Building # : ElkrH-08074                          | ROOF                       | \$ 12,000    | Roofing needs replacing due to storm damage and moos growth                                                                                                          |
| North Nehalem Hatchery | Site - North Nehalem Hatchery - Site # : NNH                               | EMERGENCY POWER            |              | Replace WWII era gen-set. Replace soft starts with VFD.                                                                                                              |
| North Nehalem Hatchery | Site - North Nehalem Hatchery - Site # : NNH                               | STORAGE TANKS              |              | Replace underground storage tanks with above-ground storage tanks                                                                                                    |
| North Nehalem Hatchery | Site - North Nehalem Hatchery - Site # : NNH                               | CRANE                      |              | Install jib crane at lower fish trap                                                                                                                                 |
| North Nehalem Hatchery | Building - Service Building w/Freezer Room (1966) - Building # : NNH-04070 | ROOF                       |              | Replace roof                                                                                                                                                         |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | REARING RACEWAY - CONCRETE | \$ 40,000.00 | Apply polymer coating to concrete raceways 7 and 8 to help control pathogens and algae                                                                               |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | BROOD POND - CONCRETE      | \$ 30,000.00 | Apply polymer coating to concrete brood pond to help control pathogens and algae                                                                                     |
| Rock Creek Hatchery    | Site - Rock Creek Hatchery - Site # : RCH                                  | UV DISINFECTION SYSTEM     | \$ 50,000.00 | Purchase and install UV disinfection and filter for Raceways 7 and 8 water supply. Improvement would relieve a large portion of chemical use and pathogen infection. |

| Site Name             | Site / Building                                              | System Name                            | Repair Amt    | Comment                                                                                                                                                        |
|-----------------------|--------------------------------------------------------------|----------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rock Creek Hatchery   | Site - Rock Creek Hatchery - Site # : RCH                    | UV DISINFECTION SYSTEM                 | \$ 50,000.00  | Purchase and install UV disinfection and filter for brood pond water supply. Improvement would relieve a large portion of chemical use and pathogen infection. |
| Rock Creek Hatchery   | Site - Rock Creek Hatchery - Site # : RCH                    | UV DISINFECTION SYSTEM                 | \$ 50,000.00  | Upgrade hatchery building filter and UV to larger capacity.                                                                                                    |
| Rock Creek Hatchery   | Site - Rock Creek Hatchery - Site # : RCH                    | BROOD PENS                             | \$ 40,000.00  | Rep[lace wooden pen structures with aluminum pen structures                                                                                                    |
| Rock Creek Hatchery   | Building - Residence (1957) - Building # : RCH-10091         | KITCHEN REMODEL                        | \$ 20,000.00  | Replace cabinets, counter tops, sinks, floor, dishwasher                                                                                                       |
| Rock Creek Hatchery   | Building - Residence (1948) - Building # : RCH-10092         | KITCHEN REMODEL                        | \$ 20,000.00  | Replace cabinets, counter tops, sinks, floor, dishwasher                                                                                                       |
| Rock Creek Hatchery   | Building - Residence 4 (1949) - Building # : RCH-10093       | KITCHEN REMODEL                        | \$ 20,000.00  | Replace cabinets, counter tops, sinks, floor, dishwasher                                                                                                       |
| Rock Creek Hatchery   | Building - Residence 5 (1948) - Building # : RCH-10094       | KITCHEN REMODEL                        | \$ 20,000.00  | Replace cabinets, counter tops, sinks, floor, dishwasher                                                                                                       |
| Rock Creek Hatchery   | Building - Hatchery Building (1948) - Building # : RCH-10140 | ROOF AND DORMERS                       | \$ 100,000.00 | Replace hatchery roof and expand office space                                                                                                                  |
| Rock Creek Hatchery   | Building - Hatchery Building (1948) - Building # : RCH-10140 | SIDING                                 | \$ 20,000.00  | Replace siding with concrete fiber and paint                                                                                                                   |
| Rock Creek Hatchery   | Building - Hatchery Building (1948) - Building # : RCH-10140 | WINDOWS                                | \$ 5,000.00   | Replace window with energy efficient vinyl-frame windows                                                                                                       |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | METAL VALVES - MEDIUM 4-10"            | \$ 4720.00    | Valve seals leak and handles are broken                                                                                                                        |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | HATCHERY SUPPLY LINES                  | \$            | Inspect hatchery water lines to rearing ponds, lakes, adult collection ponds and incubation.                                                                   |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | REARING PONDS – ASPHALT                | \$            | Ponds 9 & 10 asphalt has large cracks in wall and bottoms and needs to be resealed.                                                                            |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | REARING PONDS – CONCRETE               | \$ 5,000.00   | Replace PVC intake manifolds with aluminum material.                                                                                                           |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | ABATEMENT POND – EARTHEN               | \$ 1,600.00   | Excavate earthen pollution abatement pond.                                                                                                                     |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | WEIR                                   | \$            | Replace existing weir and modify for fish passage & flow direction into hatchery intake.                                                                       |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # : SRH                  | ADULT COLLECTION/HOLDING/SORTING PONDS | \$ 250,000.00 | update holding pond area according to "SALMON RIVER HATCHERY ADULT FISHWAY & RACEWAY HANDLING IMPROVEMENTS" DESIGN STUDY.                                      |

| Site Name             | Site / Building                                           | System Name                       | Repair Amt | Comment                                                                                    |
|-----------------------|-----------------------------------------------------------|-----------------------------------|------------|--------------------------------------------------------------------------------------------|
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # :<br>SRH            | CONCRETE RACEWAYS & ASPHALT PONDS |            | Raise height of pond sides to prevent fish escape during high water events                 |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # :<br>SRH            | POND WALKWAYS                     | \$         | Replace or re-galvanize grip strut                                                         |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # :<br>SRH            | INTAKE STRUCTURE                  | \$         | Install chain link fence around intake structure and add rails around rest of fish ladder. |
| Salmon River Hatchery | Site - Salmon River Hatchery - Site # :<br>SRH            | DAM BOARDS                        | \$         | Replace wooden dam boards with aluminum dam boards                                         |
| Trask Hatchery        | Building - Hatchery (1977) - Building # :<br>TraskH-29290 | FOUNDATION                        |            | Replace foundation of office/incubation building                                           |
| Trask Hatchery        | Site – Trask Hatchery – Site # : TraskH                   | RACEWAYS                          |            | Replace drain system for upper raceways                                                    |
| Trask Hatchery        | Building – Residence – Bldg # : 29283                     | STRUCTURE                         |            | Replace old manager's house (condemned)                                                    |
| Trask Hatchery        | Building - Residence                                      | STRUCTURE                         |            | Replace storage building/garage at supervisor's house                                      |

**Appendix G. Coastal Hatchery Reform –HB 3489**  
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