

HATCHERY AND GENETICS MANAGEMENT PLAN (HGMP)

| | |
|-----------------------------------|---|
| Hatchery Program: | Clackamas Spring Chinook |
| Species or Hatchery Stock: | Spring Chinook, Stock 19 |
| Agency/Operator: | Oregon Department of Fish and Wildlife |
| Watershed and Region: | Clackamas, North Willamette |
| Date Submitted: | October 15, 2004 May 10, 2016, May 6, 2020 December 20, 2024 |
| Date Last Updated: | December 20, 2024 |

Section 1. GENERAL PROGRAM DESCRIPTION

1.1. Name of hatchery or program.

Clackamas spring Chinook program (Stock 19).

1.2. Species and population (or stock) under propagation, and ESA status.

Clackamas Spring Chinook (*Oncorhynchus tshawytscha*)
Upper Willamette River Spring Chinook ESU - Threatened

1.3. Responsible organization and individuals

Lead Contact:

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1.4. Funding source, staffing level, and annual hatchery program operational costs.

The facilities utilized for this program are funded at various levels by the Mitchell Act, PGE, and City of Portland.

1.5. Location(s) of hatchery and associated facilities.

Clackamas Hatchery – Clackamas River, RM 22.6 (45.2961, -122.3603)
Willamette Watershed, Oregon

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Willamette Hatcheries – Various Willamette Basin
Willamette Watershed, Oregon

Eagle Creek Hatchery – Eagle Creek, RM 9.94 (45.2762, -122.2017)
Willamette Watershed, Oregon

North Fork Dam – Clackamas River, RM 30 (45.2435, -122.2803)
Willamette Watershed, Oregon

Clear Creek Acclimation – Clear Creek, RM 8.1 (45.3919, -122.4948)
Willamette Watershed, Oregon

1.6. Type of program.
Integrated Harvest

1.7. Purpose (Goal) of program.
Mitigation – The goal of this program is to mitigate for the loss of fisheries due to the construction and operation of the PGE and USACOE hydropower dams on the Clackamas and Columbia Rivers.

1.8. Justification for the program.
The program releases fin marked juvenile spring Chinook to produce hatchery adults for harvest.

1.9. List of program “Performance Standards”.
Please refer to sections 1.10.1 and 1.10.2 below.

1.10. List of program “Performance Indicators”, designated by "benefits" and "risks."

1.10.1. “Performance Indicators” addressing benefits.

Table 1.10.1. Performance Indicators addressing benefits.

| Performance Standard | Performance Indicator | Monitoring and Evaluation |
|---|--------------------------------------|----------------------------------|
| Program provides harvest opportunity | Increased harvest | Estimate annual harvest |
| Contribution of fish carcasses to the ecosystem | Developed plan for carcass outplants | Record carcass outplants |
| Satisfy legal harvest while eliminating impacts on wild populations | Developed harvest management plan | Adhere to FMEP |
| Achieve within-hatchery performance standards | Achievement of IHOT standards | Adhere to IHOT standards |

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1.10.2. “Performance Indicators” addressing risks.

Table 1.10.2. Performance Indicators addressing risks.

| Performance Standard | Performance Indicator | Monitoring and Evaluation |
|---|--------------------------------------|--|
| Assess detrimental genetic impacts | Stray rates | Estimate pHOS and record coded-wire tag recoveries |
| Potentially unpredictable egg supply | Egg take | Record broodstock metrics |
| Not achieving within-hatchery performance standards | Achievement of IHOT standards | Adhere to IHOT standards |
| Avoid disease transfer | Application of fish health standards | Adhere to fish health standards and policies |

1.11. Expected size of program.

1.11.1. Proposed annual broodstock collection level (maximum number of adult fish).

Up to 300 pairs plus additional as needed to support shortfalls in other programs.

1.11.2. Proposed annual fish release levels (maximum number) by life stage and location.

Table 1.11.2. Proposed annual fish release levels

| Life Stage | Release Location | Annual Release Level |
|--|-------------------------|-----------------------------|
| Unfed Fry¹ | Columbia Basin | Various |
| Yearling | Clackamas Basin | 965,000 ² |
| ¹ Unfed fry released from classroom incubators as part of the STEP program can vary annually depending on school participation levels. ² Although the current program goal is 965,000 yearlings, this program is authorized for up to 1.1 million total for all life stages. The program may exceed the authorized goal by 5% annually (1,155,000) and 2% over any 5-year period (1,122,000) to account for variation during rearing. | | |

1.12. Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Table 1.12. Smolt to adult survival (SAR) rates, estimated numbers produced, and escapement.

| Brood Year | Smolt-to-Adult Survival (%) | Estimated Adult Production | Escapement |
|-------------------|------------------------------------|-----------------------------------|-------------------|
| 2008 | 0.55 | 4,472 | 2,423 |
| 2009 | 0.38 | 3,615 | 2,091 |

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|------|------|-------|-------|
| 2010 | 0.41 | 6,832 | 3,453 |
| 2011 | 0.65 | 7,489 | 4,232 |
| 2012 | 0.18 | 1,516 | 471 |
| 2013 | 0.06 | 245 | 71 |
| 2014 | 0.02 | 127 | 52 |
| 2015 | 0.03 | 196 | 170 |
| 2016 | 0.09 | 701 | 392 |
| 2017 | 0.03 | 128 | 94 |
| 2018 | 2.25 | 3,742 | 2,803 |
| 2019 | 0.6 | 1,056 | 970 |

Data Source: HMS and NF Dam Counts

1.13. Date program started (years in operation), or is expected to start.

Started in 1979.

1.14. Expected duration of program.

Indefinite

1.15. Watersheds targeted by program.

Clackamas

1.16. Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

Alternative 1 – Increase program size (Not preferred)

Increased yearling releases could potentially increase fisheries, financial commitment, and impacts to listed species. This alternative is not preferred due to the increased cost and negative impact to listed species.

Alternative 2 – Reduce program size (Not preferred)

Decreased yearling releases could potentially decrease fisheries, financial commitment, and impacts to listed species. This alternative is not preferred due to the negative impact to fisheries.

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Section 2. PROGRAM EFFECTS ON NMFS ESA-LISTED SALMONID POPULATIONS. (USFWS ESA-LISTED SALMONID SPECIES AND NON-SALMONID SPECIES ARE ADDRESSED IN ADDENDUM A)

2.1. List all ESA permits or authorizations in hand for the hatchery program.

This program was evaluated under the Mitchell Act Biological Opinion signed on 1/15/2017. NMFS issued an ESA 4(d) Rule Limit 5 Take Exemption in response to a revised HGMP on 8/11/2021. This 2024 version is intended as re-submission for reinitiation of consultation.

The North Fork Dam ladder and sorting facility has an independent Section 10 authorization for incidental take during operation.

2.2. Provide descriptions, status, and projected take actions and levels for NMFS ESA-listed natural populations in the target area.

2.2.1. Description of NMFS ESA-listed salmonid population(s) affected by the program.

- Identify the NMFS ESA-listed population(s) that will be directly affected by the program.

Table 2.2.1.1 NMFS ESA-listed populations directly affected by the program.

| Life Stage | Activity | Affected NMFS ESA-listed Population |
|------------|------------|-------------------------------------|
| Adult | Broodstock | Upper Willamette Chinook |

- Identify the NMFS ESA-listed population(s) that may be incidentally affected by the program.

Table 2.2.1.2 NMFS ESA-listed populations incidentally affected by the program.

| Life Stage | Activity | Affected NMFS ESA-listed Population |
|------------|------------------------|---|
| Adult | Trap Operations | Upper Willamette Chinook Salmon |
| | | Lower Columbia River Steelhead |
| | | Lower Columbia River Coho Salmon |
| Juvenile | Ecological Competition | Columbia River Chum Salmon |
| | | Lower Columbia Chinook Salmon |
| | | Lower Columbia River Coho Salmon |
| | | Lower Columbia River Steelhead |
| | | Middle Columbia River Steelhead |
| | | Upper Columbia River Spring-run Chinook |

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| | |
|--|--|
| | Upper Columbia River Steelhead |
| | Upper Willamette Chinook Salmon |
| | Upper Willamette Steelhead |
| | Snake River Spring/Summer-run Chinook Salmon |
| | Snake River Fall-run Chinook Salmon |
| | Snake River Sockeye Salmon |
| | Snake River Basin Steelhead |

2.2.2. Status of NMFS ESA-listed salmonid population(s) affected by the program.

Due to the independent authorization for take at North Fork Dam, and the low likelihood that listed populations will be affected through ecological competition, only assessments of listed populations affected by the Clackamas Hatchery Trap and angler caught winter steelhead broodstock program are presented here.

- Describe the status of the listed natural population(s) relative to “critical” and “viable” population thresholds.

Table 2.2.2.1 Description of listed population thresholds.

| Affected NMFS ESA-listed Population | Status |
|-------------------------------------|--|
| Upper Willamette Chinook Salmon | Moderate to very high extinction risk. |
| Lower Columbia River Steelhead | Moderate extinction risk. |
| Lower Columbia River Coho Salmon | Moderate extinction risk. |

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

Productivity assessments are described in the Lower Columbia River Conservation and Recovery Plan for Oregon Populations of salmon and steelhead (ODFW 2010).

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Table 2.2.2.2. Abundance estimates of listed natural origin Clackamas spring Chinook, fall Chinook, winter steelhead, and Coho.

| Year | Spring Chinook | Fall Chinook | Winter Steelhead | Coho |
|------|----------------|--------------|------------------|--------|
| 2012 | 2,217 | 60 | 2,733 | 1,663 |
| 2013 | 2,740 | 360 | 2,427 | 4,012 |
| 2014 | 1,231 | 127 | 3,404 | 10,672 |
| 2015 | 3,041 | 192 | 3,740 | 1,784 |
| 2016 | 4,346 | 711 | 4,144 | 1,628 |

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| | | | | |
|------|-------|-----|-------|--------|
| 2017 | 4,534 | 34 | 2,531 | 7,598 |
| 2018 | 2,864 | 673 | 3,030 | 3,159 |
| 2019 | 2,823 | 880 | 1,500 | 4,044 |
| 2020 | 5,068 | 111 | 2,005 | 9,012 |
| 2021 | 3,540 | 36 | 990 | 10,572 |
| 2022 | 4,194 | 43 | 1,566 | 13,796 |
| 2023 | 4,698 | 37 | 1,277 | 19,916 |

Data Source: ODFW Salmon and Steelhead Recovery Tracker.

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

Table 2.2.2.3. Annual estimates of pHOS for Clackamas spring Chinook, fall Chinook, winter steelhead, and Coho.

| Year | Spring Chinook | Fall Chinook | Winter Steelhead | Coho |
|------|----------------|--------------|------------------|-------|
| 2012 | 5.5% | 81.3% | 2.0% | 8.3% |
| 2013 | 4.6% | 7.6% | 10.1% | 2.8% |
| 2014 | 2.4% | 30.6% | 0.5% | 14.3% |
| 2015 | 3.8% | 37.7% | 7.1% | 11.4% |
| 2016 | 2.6% | 21.9% | 8.1% | 8.9% |
| 2017 | 1.5% | 62.2% | 1.1% | 11.9% |
| 2018 | 3.4% | 5.1% | 11.6% | 9.5% |
| 2019 | 3.4% | 5.2% | 11.9% | 4.6% |
| 2020 | 3.4% | 0.0% | 7.8% | N/A |
| 2021 | 3.4% | 0.1% | 8.4% | 1.7% |
| 2022 | 3.4% | 0.0% | 8.4% | 4.3% |
| 2023 | 2.0% | 0.0% | 3.1% | 2.6% |

Data Source: ODFW Salmon and Steelhead Recovery Tracker.

2.2.3. Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of NMFS listed fish in the target area, and provide estimated annual levels of take (see “Attachment 1” for definition of “take”).

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Listed Chinook will be taken for incorporation into broodstock. Broodstock collection also has potential to take listed steelhead, Chinook, and Coho through migration delay, capture, handling, and release during trap operation.

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- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

Table 2.2.3.1. Number of listed natural origin coho, steelhead, and spring Chinook salmon captured associated with all programs at Clackamas Hatchery, including angler caught broodstock from Jan. 1 – Dec. 31.

| Calendar Year | Coho | | Winter Steelhead | | Spring Chinook | |
|---------------|---------|-----------|------------------|-----------|----------------|-----------|
| | Capture | Mortality | Capture | Mortality | Capture | Mortality |
| 2015 | 0 | 0 | 0 | 0 | 4 | 0 |
| 2016 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 46 | 5 | 0 | 0 |
| 2019 | 0 | 0 | 52 | 1 | 13 | 0 |
| 2020 | 0 | 0 | 49 | 0 | 10 | 0 |
| 2021 | 0 | 0 | 41 | 0 | 5 | 0 |
| 2022 | 13 | 0 | 49 | 3 | 15 | 0 |
| 2023 | 1 | 0 | 47 | 0 | 107 | 0 |
| 2024 | 0 | 0 | 45 | 1 | 85 | 0 |

Data Source: HMS and program records.

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

The values below represent all take for Clackamas Hatchery and the angler caught winter steelhead broodstock program from Jan. 1 – Dec. 31 due to overlapping broodstock collection seasons.

Table 2.2.3.2. Estimated annual take levels of listed natural origin Coho.

| Listed Species: <u>Coho</u> | ESU: <u>Lower Columbia River</u> | | Activity: <u>Trapping</u> | |
|--|---|-----------------------|----------------------------------|----------------|
| Location: <u>Clackamas Hatchery</u> | Dates: <u>Jan 1 – Dec 31</u> | | Operator: <u>ODFW</u> | |
| Type of Take | Annual Take of Listed Fish by Life Stage | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass | | | | |
| Collect for transport | | | | |
| Capture, handle, and release | | | | |

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| | | | | |
|--|--|--|-----|--|
| Capture, handle, tag/mark/tissue sample, and release | | | 100 | |
| Removal (e.g. broodstock) | | | | |
| Intentional lethal take | | | | |
| Unintentional lethal take | | | ≤ 3 | |
| Other Take (specify) | | | | |

Table 2.2.3.3. Estimated annual take levels of listed natural origin steelhead.

| | | | | |
|---|---|-----------------------|--|----------------|
| Listed Species: <u>Steelhead</u> | ESU: <u>Lower Columbia</u> | | Activity: <u>Trapping/Angling</u> | |
| Location: <u>Clackamas Hatchery/Willamette Basin</u> | Dates: <u>Jan 1 – Dec 31</u> | | Operator: <u>ODFW</u> | |
| Type of Take | Annual Take of Listed Fish by Life Stage | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass | | | | |
| Collect for transport | | | | |
| Capture, handle, and release | | | | |
| Capture, handle, tag/mark/tissue sample, and release | | | 200 | |
| Removal (e.g. broodstock) | | | 49 | |
| Intentional lethal take | | | | |
| Unintentional lethal take | | | ≤ 6 | |
| Other Take (specify) | | | | |

Table 2.2.3.4. Estimated annual take levels of listed natural origin Chinook.

| | | | | |
|--|---|-----------------------|----------------------------------|----------------|
| Listed Species: <u>Chinook</u> | ESU: <u>Upper Willamette</u> | | Activity: <u>Trapping</u> | |
| Location: <u>Clackamas Hatchery</u> | Dates: <u>Jan 1 – Dec 31</u> | | Operator: <u>ODFW</u> | |
| Type of Take | Annual Take of Listed Fish by Life Stage | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass | | | | |
| Collect for transport | | | | |
| Capture, handle, and release | | | | |
| Capture, handle, tag/mark/tissue sample, and release | | | 350 | |
| Removal (e.g. broodstock) | | | 120 | |
| Intentional lethal take | | | | |
| Unintentional lethal take | | | ≤ 11 | |
| Other Take (specify) | | | | |

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- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Facility operations and fish handling procedures will be modified immediately if listed fish mortality related to operation is identified in or near the trap. This may include, but is not limited to, additional staff training or review of proper procedures, trap modifications, cessation of trapping, modified operation by hatchery personnel, etc.

Section 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1. Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review Report and Recommendations - NPPC document 99-15*). Explain any proposed deviations from the plan or policies.

The hatchery program will be operated consistent with the Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead, ODFW's Native Fish Conservation Policy, and ODFW's Hatchery Management Policy.

3.2. List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates. *Indicate whether this HGMP is consistent with these plans and commitments, and explain any discrepancies.*

N/A

3.3. Relationship to harvest objectives.

Juvenile hatchery spring Chinook released by this program are mass marked to facilitate selective harvest of hatchery fish.

3.3.1. Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available. *Also provide estimated future harvest rates on fish propagated by the program, and on listed fish that may be taken while harvesting program fish.*

This program supports fisheries in the Clackamas River, Lower Willamette, and Lower Columbia River with a harvest level described in Table 1.12.

3.4. Relationship to habitat protection and recovery strategies.

Assumption regarding habitat conditions related to this program are that freshwater habitat is at capacity, production is not limited in other habitat for different life stages, and artificially produced populations can coexist without jeopardizing the fitness of natural populations. Considering these assumptions, this program rears juveniles from

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egg to yearling in a hatchery setting to avoid impacting freshwater habitat availability. Those juveniles are then released at optimized times to emigrate and utilized more available habitat, ultimately minimizing impacts to habitat.

3.5. Ecological interactions. [Please review Addendum A before completing this section. If it is necessary to complete Addendum A, then limit this section to NMFS jurisdictional species. Otherwise complete this section as is.]

Listed fish have potential to both negatively impact and be negatively impacted by the program through competition for resources and attraction of predators. Listed fish in the area may positively impact and be positively impacted by the program through increased nutrient cycling and the subsequent increase in production potential of surrounding habitats.

Section 4. WATER SOURCE

4.1. Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Clackamas Hatchery – 50 cfs are authorized from the Clackamas River with an additional 370 gpm of ground water. Operation and discharge are authorized under a NPDES permit.

Eagle Creek Hatchery – 34.02 cfs are authorized from Eagle Creek and spring water. Operation and discharge are authorized under a NPDES permit.

4.2. Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

Hatcheries adhere to water right and NPDES permits.

Section 5. FACILITIES

5.1. Broodstock collection facilities (or methods).

Broodstock are collected from adult traps located at Clackamas Hatchery, North Fork Dam, and Eagle Creek Hatchery. At each location, adults enter fish ladders leading to temporary holding ponds.

5.2. Fish transportation equipment (description of pen, tank truck, or container used).

Juvenile and adult transportation is performed by liberation trucks or portable liberation tanks. Liberation trucks are typically 1,000–2,500-gallon capacity units, either mounted on a large flatbed or tanker style truck. The trucks are equipped with oxygen diffusing systems, water re-circulation pumps, and dissolved oxygen meters. Portable liberation

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tanks have a capacity of 300 gallons and are equipped with oxygen diffusion systems. The transfer of juvenile fish on station is performed using a distribution box, irrigation pipe and a gas-powered water pump. Eggs and milt are transported via passenger vehicles in small, covered containers.

5.3. Broodstock holding and spawning facilities.

Broodstock are held at the Clackamas and Eagle Creek hatcheries. The Clackamas Hatchery holding pond consists of a concrete raceway with multiple dividers. Spawning is conducted under a covered platform.

5.4. Incubation facilities.

Eggs are incubated in vertical stack incubators with a capacity of 10,000 eggs per tray. Flow through the trough incubators is 3-6 gpm.

5.5. Rearing facilities.

Juveniles are reared in various sized asphalt and concrete raceways at Clackamas Hatchery, Eagle Creek Hatchery, and potentially other regional hatchery facilities.

5.6. Acclimation/release facilities.

Acclimation and release facilities are located at Clackamas Hatchery, Eagle Creek Hatchery, Eagle Fern Acclimation Facility, and Clear Creek Acclimation Facility. Locations utilize asphalt raceways, concrete raceways, and above ground ponds.

5.7. Describe operational difficulties or disasters that led to significant fish mortality.

Significant fish mortality could occur due to human error, disease outbreaks, intake failure, high stream flows, drought, high temperatures, low temperatures, wildfire, or various other natural disasters.

5.8. Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Hatchery-origin spring Chinook propagated under this program are ESA-listed. Back-up generators, automatic alarm and notification systems, UV light treatment, and 24/7 on-call staff are all utilized to avoid and minimize impacts from operational failures at the hatchery. Hatchery and fish health staff continuously work to minimize disease transmission.

Section 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

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6.1. Source.

Broodstock for the Clackamas spring Chinook (stock-19) were originally sourced from various stocks of spring Chinook returning to the Willamette Basin.

6.2. Supporting information.

6.2.1. History.

The Clackamas spring Chinook hatchery program first began in the early 1976 utilizing returns to the Willamette Basin.

6.2.2. Annual size.

Up to 300 pairs are necessary for production, plus additional as needed to support shortfalls in other programs. After an initial 3-year revitalization of the brood, up to 45 natural origin adults will be taken for broodstock in a manner consistent with the sliding scale in section 7.4.1.

6.2.3. Past and proposed level of natural fish in broodstock.

Up to 120 natural origin adults are currently being taken for broodstock. When the initial 3-year revitalization is achieved, natural origin broodstock will be utilized in a manner consistent with the sliding scale in section 7.4. Between 85 and 107 natural adults have been taken for broodstock annually since incorporation of natural origin adults in 2022.

6.2.4. Genetic or ecological differences.

Clackamas hatchery spring Chinook are likely to exhibit differences from the naturally produced Willamette basin spring Chinook including decreased genetic diversity.

6.2.5. Reasons for choosing.

Integration of local, natural origin spring Chinook into the hatchery population will preserve existing hatchery-wild genetic relationships, while boosting diversity within the hatchery population. Integration of wild fish into the hatchery brood will serve to mitigate genetic risk from the program and may improve the performance.

6.3. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects on listed natural fish that may occur as a result of broodstock selection practices.

The program will be managed as an integrated population, receiving gene flow from the wild population on a regular basis. This management approach will decrease the rate of

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genetic divergence between the wild and hatchery populations, effectively mitigating for genetic risk.

Section 7. BROODSTOCK COLLECTION

7.1. Life-history stage to be collected (adults, eggs, or juveniles).

Adults

7.2. Collection or sampling design.

The traps described above typically target spring Chinook throughout the run.

7.3. Identity.

Adipose fin clips are used to identify returning Clackamas hatchery spring Chinook. Natural origin spring Chinook are identified by the presence of a fully intact and developed adipose fin. Other marks may be considered in the future if necessary.

7.4. Proposed number to be collected:

7.4.1. Program goal (assuming 1:2 sex ratio for adults)

Up to 300 pairs are necessary for production, plus additional as needed to support shortfalls in other programs. Up to 120 natural origin adults are currently taken for broodstock. When the initial 3-year revitalization is achieved, natural origin broodstock will be utilized in a manner consistent with the sliding scale below.

Table 7.4.1 Sliding scale for incorporation of natural origin broodstock.

| NOR Count on 31 July | Estimated NOR Run Size | NOR to Collect for Broodstock | | |
|----------------------|------------------------|-------------------------------|---------|-------|
| | | Males | Females | Total |
| <1000 | <1000 | 0 | 0 | 0 |
| 1000 – 2000 | 1000 – 2500 | 7 | 14 | 21 |
| >2000 | >2500 | 15 | 30 | 45 |

7.4.2. Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Table 7.4.2. Broodstock collection levels.

| Brood Year | Adults | | Pond Loss |
|------------|---------|-------|-----------|
| | Females | Males | |
| 2015 | 367 | 185 | 633 |
| 2016 | 399 | 200 | 89 |
| 2017 | 168 | 86 | 113 |
| 2018 | 53 | 28 | 35 |
| 2019 | 70 | 36 | 44 |

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| Brood Year | Adults | | Pond Loss |
|------------|---------|-------|-----------|
| | Females | Males | |
| 2020 | 204 | 103 | 99 |
| 2021 | 163 | 84 | 107 |
| 2022 | 314 | 162 | 227 |
| 2023 | 343 | 204 | 78 |
| 2024 | 297 | 160 | 210 |

Data source: HMS

- 7.5. Disposition of hatchery-origin fish collected in surplus of broodstock needs.**
Dispositions of surplus hatchery adults include, but are not limited to, recycling back into the fishery, tribal ceremonial and subsistence, educational purposes, broodstock for other programs experiencing shortfalls, sold, stream enrichment, foodbanks, animal feed, or discard into a landfill.
- 7.6. Fish transportation and holding methods.**
Adults collected for broodstock at North Fork Dam are transported to Clackamas Hatchery where they are held until ready to spawn. Adults are also transported downstream for the fishery.
- 7.7. Describe fish health maintenance and sanitation procedures applied.**
The fish health monitoring plan is based on the Integrated Hatchery Operations Team for the Columbia Basin Anadromous Salmonid Hatcheries (see Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration) and the ODFW Fish Health Management Policy (OAR 635-007-0960 to 635-007-0995). Other resources are used to guide the program and management of diseases such as American Fisheries Society Fish Health Section Blue Book and the World Organisation for Animal Health Manual of Diagnostic tests for Aquatic Animals.
- 7.8. Disposition of carcasses.**
Carcasses are to be used for stream enrichment or disposed of in accordance with ODFW policies and procedures, which include freezing, rendering, or burying.
- 7.9. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects on listed natural fish resulting from the broodstock collection program.**
The risks of disease in broodstock will be minimized by protocols described above in section 7.7. Broodstock will be collected from the entire run period to maintain genetic diversity within the hatchery-produced population.

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Section 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1. Selection method.

Adults are collected randomly from throughout the temporal distribution of the run to avoid any timing or size bias.

8.2. Males.

Males are generally only used once during spawning. Jacks may be used in the broodstock.

8.3. Fertilization.

This program intends to utilize 1:2 male-to-female ratios in a 1 X 2 matrix system. Alternative matrices will be used when necessary. Gametes are pooled prior to fertilization.

8.4. Cryopreserved gametes.

Cryopreservation is not utilized for this program.

8.5. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects on listed natural fish resulting from the mating scheme.

Factorial mating schemes and random broodstock selection will be used to reduce the risk of loss of within-population genetic diversity.

Section 9. INCUBATION AND REARING

Specify any management *goals* (e.g. “egg to smolt survival”) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1. Incubation:

9.1.1. Number of eggs taken and survival rates to eye-up and/or ponding.

Table 9.1.1. Eggs Taken and Survival Rates

| Brood Year | Egg Take | Percent Survival to Eye-up |
|-------------------|-----------|----------------------------|
| 2011 | 1,585,552 | 95.0 |
| 2012 | 1,511,372 | 97.6 |
| 2013 | 1,259,708 | 93.7 |
| 2014 ¹ | 1,193,611 | 92.4 |

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| | | |
|-------------------|-----------|------|
| 2015 | 1,450,703 | 90.0 |
| 2016 | 1,661,557 | 89.0 |
| 2017 | 614,922 | 92.2 |
| 2018 | 221,965 | 94.5 |
| 2019 | 261,694 | 90.5 |
| 2020 ¹ | 871,830 | 92.9 |
| 2021 | 611,388 | 84.1 |
| 2022 | 1,339,058 | 90.1 |

¹ Inventory error. Egg take was underestimated.

Data Source: HMS

9.1.2. Cause for, and disposition of surplus egg takes.

Surplus spring Chinook eggs are typically collected to compensate for egg to smolt mortality, genetic considerations, and BKD culling. Positive BKD eggs are culled. If necessary, additional eggs are culled to avoid program goal exceedance. The latest eggs taken are the most likely to be culled for program exceedances.

9.1.3. Loading densities applied during incubation.

The average size of spring Chinook eggs is about 97-116 eggs per ounce. Water flows at 3-6 gmp through incubators. Each vertical incubating tray is loaded with up to 10,000 eggs. Loading densities and incubator flows for STEP classroom incubators vary depending on the set-up.

9.1.4. Incubation conditions.

The water temperature and flow are monitored daily with a range of 37° – 56°F at 3-6 gpm. Dissolved oxygen (DO) ranges between 9 and 10 parts per million (ppm).

STEP classroom incubators are occasionally monitored. These systems typically run at ambient room temperatures with ice added daily in attempt to keep temperatures in the optimum range of 50 to 60°F.

9.1.5. Ponding.

Fry are manually relocated from incubators once 80 - 90% buttoned up at approximately 1,600 temperature units and 1,400 fish per pound.

9.1.6. Fish health maintenance and monitoring.

The fish health monitoring plan is based on the Integrated Hatchery Operations Team for the Columbia Basin Anadromous Salmonid Hatcheries (see Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration) and the ODFW Fish Health Management Policy (OAR 635-007-0960 to 635-007-0995). Other resources are

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used to guide the program and management of diseases such as American Fisheries Society Fish Health Section Blue Book and the World Organization for Animal Health Manual of Diagnostic tests for Aquatic Animals.

9.1.7. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects on listed fish during incubation.

Eggs are incubated on well water or treated river water to prevent exposure to disease and kept isolated by family group. Water supplies and the power supply are alarmed to notify hatchery personnel if a failure occurs and hooked up to a back-up generator, in case of a power failure. Hatchery staff are available 24 hr/day for immediate response to any emergency situation.

9.2. Rearing:

9.2.1. Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years, or for years dependable data are available.

Table 9.2.1 Rearing survival rates.

| Brood Year | Number of Fry Poned | Number of Juveniles at Marking | Percent Survival to Marking |
|-------------------|----------------------------|---------------------------------------|------------------------------------|
| 2011 ¹ | 1,981,541 | 1,603,067 | 80.9 |
| 2012 | 1,328,594 | 928,705 | 69.9 |
| 2013 | 998,564 | 836,122 | 83.7 |
| 2014 ¹ | 1,501,969 | 1,215,093 | 80.9 |
| 2015 | 1,217,134 | 1,124,415 | 92.4 |
| 2016 | 1,292,778 | 1,132,125 | 87.6 |
| 2017 | 555,693 | 492,983 | 88.7 |
| 2018 | 202,677 | 172,305 | 85.0 |
| 2019 | 234,938 | 178,719 | 76.1 |
| 2020 ¹ | 1,021,616 | 826,487 | 80.9 |
| 2021 | 474,195 | 384,915 | 81.2 |
| 2022 | 1,134,280 | 723,463 | 63.8 |

¹Number ponded is corrected for count at marking

Data source: HMS

9.2.2. Density and loading criteria (goals and actual levels).

The goal is to maintain less than 1.0 lb of fish per cubic foot of water during rearing.

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9.2.3. Fish rearing conditions

Water temperatures range from 35° – 65°F. Dissolved oxygen will be maintained at 6 ppm or greater.

9.2.4. Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Only weight samples are collected for inclusion in monthly pond reports.

Table 9.2.4. Average end-of-month size

| Month | Size (fpp) |
|-------|------------|
| 1 | 1148.3 |
| 2 | 661.9 |
| 3 | 517.4 |
| 4 | 346.4 |
| 5 | 216.3 |
| 6 | 126.0 |
| 7 | 80.6 |
| 8 | 55.1 |
| 9 | 37.0 |
| 10 | 25.9 |
| 11 | 22.3 |
| 12 | 19.4 |
| 13 | 16.7 |
| 14 | 14.9 |
| 15 | 14.0 |
| 16 | 11.3 |

Data source: HMS

9.2.5. Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

See Table 9-4 above for fish growth. No energy reserve data is available.

9.2.6. Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Fish are fed according to the feed manufacturer's guidance and ODFW's growth program tool.

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- 9.2.7. Fish health monitoring, disease treatment, and sanitation procedures.**
The fish health monitoring plan is based on the Integrated Hatchery Operations Team for the Columbia Basin Anadromous Salmonid Hatcheries (see Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration) and the ODFW Fish Health Management Policy (OAR 635-007-0960 to 635-007-0995). Other resources are used to guide the program and management of diseases such as American Fisheries Society Fish Health Section Blue Book and the World Organisation for Animal Health Manual of Diagnostic tests for Aquatic Animals.
- 9.2.8. Smolt development indices (e.g. gill ATPase activity), if applicable.**
Weight samples of the fish are taken monthly to ensure proper growth rate.
- 9.2.9. Indicate the use of "natural" rearing methods as applied in the program.**
“Natural” rearing methods are not utilized by this program.
- 9.2.10. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects on listed fish under propagation.**
Rearing ponds are cleaned on weekly basis or as necessary through visual observation of solid wastes on pond bottom.

Section 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1. Proposed fish release levels. (Use standardized life stage definitions by species presented in Attachment 2. “Location” is watershed planted (e.g. “Elwha River”).)

Table 10.1. Proposed annual fish release levels

| Age Class | Maximum Number | Size (fpp) | Release Date | Location |
|------------------------------|-----------------------|-------------------|---------------------|---|
| Unfed Fry¹ | Various | Various | Various | Columbia Basin |
| Yearling | 965,000 ² | 10 - 12 | February - April | Clackamas Hatchery, Eagle Fern Acclimation, and Clear Creek Acclimation |

¹ Unfed fry released from classroom incubators as part of the STEP program can vary annually depending on school participation levels.

² Although the current program goal is 965,000 yearlings, this program is authorized for up to 1.1 million total for all life stages. The program may exceed the authorized goal by 5% annually (1,155,000) and 2% over any 5-year period (1,122,000) to account for variation during rearing.

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10.2. Specific location(s) of proposed release(s).

Stream, river, or watercourse: Clackamas River
 Release point: Clackamas Hatchery
 Major watershed: Clackamas
 Basin or Region: Willamette

Stream, river, or watercourse: Eagle Creek
 Release point: Eagle Fern Acclimation
 Major watershed: Clackamas
 Basin or Region: Willamette

Stream, river, or watercourse: Clear Creek
 Release point: Clear Creek Acclimation
 Major watershed: Clackamas
 Basin or Region: Willamette

10.3. Actual numbers and sizes of fish released by age class through the program.

Table 10.3. Program releases.

| Brood Year | Yearling | Average Size |
|-------------------|-----------------|---------------------|
| 2011 | 973,165 | 11.0 |
| 2012 | 743,852 | 10.8 |
| 2013 | 636,525 | 10.1 |
| 2014 | 737,634 | 11.7 |
| 2015 | 775,026 | 11.2 |
| 2016 | 768,214 | 12.8 |
| 2017 | 466,184 | 13.8 |
| 2018 | 166,500 | 19.0 |
| 2019 | 176,242 | 19.9 |
| 2020 | 453,279 | 13.3 |
| 2021 | 257,418 | 14.0 |
| 2022 | 857,005 | 15.4 |
| Average | 584,254 | 13.6 |

Data source: HMS

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10.4. Actual dates of release and description of release protocols.

Yearlings are crowed out of the raceways. STEP fry are directly released. Release timing will fluctuate with various environmental factors such as water conditions, flows, precipitation, moon phases, and tides to optimize survival and emigration.

Table 10.4. Annual release dates.

| Brood Year | Release Date Range |
|-------------------|---------------------------|
| 2011 | 3/7 – 5/3 |
| 2012 | 3/7 – 5/2 |
| 2013 | 3/5 – 3/26 |
| 2014 | 3/2 – 3/30 |
| 2015 | 1/10 – 4/7 |
| 2016 | 2/28 – 3/28 |
| 2017 | 2/4 – 3/19 |
| 2018 | 3/24 |
| 2019 | 3/16 |
| 2020 | 3/14 |
| 2021 | 11/21 – 3/13 |
| 2022 | 2/20 |

Data Source: HMS

10.5. Fish transportation procedures, if applicable.

All yearling are transported in liberations trucks described above.

10.6. Acclimation procedures (methods applied and length of time).

Juveniles are acclimated at Clackamas Hatchery and released up to 8 months later. Other juveniles are acclimated for 2 – 3 weeks at the Clear Creek and Eagle Fern acclimation facilities prior to release.

10.7. Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

The program goal is to mass mark 100% spring Chinook yearlings with an adipose fin clip and majority of the juveniles retain their marks. A portion of the yearlings will receive coded-wire tags. Alternative marking may be used if necessary. Fry released from STEP programs are unmarked.

10.8. Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

Under current policy, surplus juveniles are destroyed or marked and released into a closed water system such as a lake, reservoir or pond where they contribute to angling

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opportunities. In general, OAR 635-007-0545 directs disposition of surplus hatchery juveniles.

10.9. Fish health certification procedures applied pre-release.

The fish health monitoring plan is based on the Integrated Hatchery Operations Team for the Columbia Basin Anadromous Salmonid Hatcheries (see Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration) and the ODFW Fish Health Management Policy (OAR 635-007-0960 to 635-007-0995). Other resources are used to guide the program and management of diseases such as American Fisheries Society Fish Health Section Blue Book and the World Organisation for Animal Health Manual of Diagnostic tests for Aquatic Animals.

10.10. Emergency release procedures in response to flooding or water system failure.

Emergency releases may occur at any size or point in time during rearing in response water system failure, disease, drought, wildfire, flood, rising air/water temperatures, or any other adverse environmental conditions that may pose a threat to hatchery staff and/or hatchery fish.

Emergency releases will occur after the hatchery crew has exhausted all possibilities for retaining the fish and consulted with the ODFW District Biologist. Emergency releases will be limited to the Willamette basin, or into a closed water body per OAR 635-007-0545.

10.11. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects on listed fish resulting from fish releases.

Juveniles are generally released in the spring downstream of North Fork Dam at larger sizes than natural fish to minimize potential interactions during emigration.

Section 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1. Monitoring and evaluation of “Performance Indicators” presented in Section 1.10.

11.1.1. Describe plans and methods proposed to collect data necessary to respond to each “Performance Indicator” identified for the program.

Table 11.1.1. Methods for evaluating program indicators.

| Performance Indicator M&E | Methods |
|--------------------------------------|--|
| Estimate annual harvest | Query harvest card and ELS data |
| Record carcass outplants | Keep hatchery records of adult dispositions. |
| Adhere to FMPEP | N/A |

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| | |
|--|---|
| Adhere to IHOT standards | N/A |
| Estimate pHOS and record coded-wire tag recoveries | Query OASIS spawning ground survey results and coded-wire tag recoveries. |
| Record broodstock metrics | Keep hatchery records of broodstock numbers and egg take. |
| Adhere to fish health standards and policies | N/A |

11.1.2. Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

Current funding is sufficient to implement the activities identified in 11.1.1. Any additional monitoring or evaluations would require additional funding/staffing.

11.2. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects on listed fish resulting from monitoring and evaluation activities.

Listed fish will not be affected by monitoring or evaluation.

Section 12. RESEARCH

This program does not currently have a research nexus.

Section 13. ATTACHMENTS AND CITATIONS

AFS-FHS (American Fisheries Society-Fish Health Section). 2014. FHS blue book: suggested procedures for the detection and identification of certain finfish and shellfish pathogens, 2020 edition. Accessible at: <https://units.fisheries.org/fhs/fish-health-section-blue-book-2020/>

IHOT (Integrated Hatchery Operations Team). 1996. Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin. Volume II-Oregon. Annual Report 1995. Portland, OR. Project Number 92-043, Contract Number DE-BJ79-91BP60629.

NMFS. 2017. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. NOAA’s National Marine Fisheries Service’s implementation of the Mitchell Act Final Environmental Impact Statement preferred alternative and administration of Mitchell Act hatchery funding. January 15, 2017. NMFS Consultation No.: WCR-2014-697. 535p.

ODFW. 2010a. Final Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead. August 6, 2010. 437p.

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Oregon Administrative Rules (OAR 635-007- -0542 through -0548). 2003. Fish Health Management Policy. Oregon Department of Fish and Wildlife, Salem, OR.

Oregon Administrative Rules (OAR 635-007-0960 through 1000). 2003. Fish Health Management Policy. Oregon Department of Fish and Wildlife, Salem, OR.

Oregon Administrative Rules (OAR 635-007-050 2 through -0509). 2002. Native Fish Conservation Policy. Oregon Department of Fish and Wildlife, Salem, OR.

World Organisation for Animal Health (OIE). (2024). Manual of Diagnostic Tests for Aquatic Animals, eleventh editions 2024. Available at: <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-manual-online-access/>

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Section 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

“I hereby certify that the information provided is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.”

Name, Title, and Signature of Applicant:

Certified by _____ Date: _____

Attachment 1. Age class designations by fish size and species for salmonids released from hatchery facilities.
(generally from Washington Department of Fish and Wildlife, November 1999)

| | Species/Age Class | Size Criteria | |
|---|-------------------------------|----------------------|-------------|
| | | Number of fish/pound | Grams/fish |
| X | Chinook Yearling | <=20 | >=23 |
| X | Chinook (Zero) Fingerling | >20 to 150 | 3 to <23 |
| X | Chinook Fry | >150 to 900 | 0.5 to <3 |
| X | Chinook Unfed Fry | >900 | <0.5 |
| X | Coho Yearling ¹ | <20 | >=23 |
| X | Coho Fingerling | >20 to 200 | 2.3 to <23 |
| X | Coho Fry | >200 to 900 | 0.5 to <2.3 |
| X | Coho Unfed Fry | >900 | <0.5 |
| X | Chum Fed Fry | <=1000 | >=0.45 |
| X | Chum Unfed Fry | >1000 | <0.45 |
| X | Sockeye Yearling ² | <=20 | >=23 |
| X | Sockeye Fingerling | >20 to 800 | 0.6 to <23 |
| X | Sockeye Fall Releases | <150 | >2.9 |
| X | Sockeye Fry | > 800 to 1500 | 0.3 to <0.6 |
| X | Sockeye Unfed Fry | >1500 | <0.3 |
| X | Pink Fed Fry | <=1000 | >=0.45 |
| X | Pink Unfed Fry | >1000 | <0.45 |
| X | Steelhead Smolt | <=10 | >=45 |
| X | Steelhead Yearling | <=20 | >=23 |
| X | Steelhead Fingerling | >20 to 150 | 3 to <23 |
| X | Steelhead Fry | >150 | <3 |
| X | Cutthroat Trout Yearling | <=20 | >=23 |
| X | Cutthroat Trout Fingerling | >20 to 150 | 3 to <23 |
| X | Cutthroat Trout Fry | >150 | <3 |
| X | Trout Legals | <=10 | >=45 |
| X | Trout Fry | >10 | <45 |

¹ Coho yearlings defined as meeting size criteria and 1 year old at release, and released prior to June 1st.

² Sockeye yearlings defined as meeting size criteria and 1 year old.