HATCHERY AND GENETICS MANAGEMENT PLAN (HGMP)

Hatchery Program:	Sandy Winter Steelhead
Species or Hatchery Stock:	Winter Steelhead (stock 11)
Agency/Operator:	Oregon Department of Fish and Wildlife
Watershed and Region:	Sandy, North Willamette
Date Submitted:	March 6, 2002 August 1, 2013 December 20, 2024
Date Last Updated:	December 20, 2024

Section 1. General Program Description

1.1. Name of hatchery or program.
Sandy winter steelhead program (Stock 11)

1.2. Species and population (or stock) under propagation, and ESA status.
Sandy winter steelhead (*Oncorhynchus mykiss*)
Lower Columbia River Steelhead ESU – Threatened

1.3. Responsible organization and individuals

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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, State of Oregon, BPA, Sport Fish Restoration Act, and USACE.

1.5. Location(s) of hatchery and associated facilities.
Sandy Hatchery- Cedar Creek, RM 0.75 (45.40694, -122.2531)

This program shall be implemented according to the Incidental Take Statement, Terms and Conditions, and Hatchery Operation Framework of the NMFS Mitchell Act Biological Opinion. Any deviation from the biological opinion must be approved by NMFS.

1.6. Type of program.
Integrated Harvest

1.7. Purpose (Goal) of program.
Augmentation - The goal of this program is to increase recreational harvest opportunities by releasing artificially propagated smolts.

1.8. Justification for the program.
The program releases fin marked juveniles to produce hatchery adults for harvest.

1.9. List of program "Performance Standards".
See Section 1.10.1 and 1.10.2 below.

1.10. List of "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

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

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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 100 pairs for production 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
Yearling	Cedar Creek	170,000[1]
[1] The program may exceed the release goal by 5% annually (178,500) and 2% over any 5-year period (173,400) 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
2009	2.05	3,634	1,291
2010	2.84	5,093	1,910
2011	3.09	3,648	1,305
2012	2.40	3,298	561
2013	5.54	9,819	3,589
2014	1.06	1,356	389
2015	0.73	1,561	609
2016	0.64	2,085	804
2017	0.71	1,599	562
2018	0.55	1,073	445
2019	1.20	2,656	1,207
2020	0.45	1,394	283

Data Source: HMS and

1.13. Date program started (years in operation), or is expected to start.
Started in 1955.

1.14. Expected duration of program.
Indefinite

1.15. Watersheds targeted by program.
Sandy

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

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 Sandy River Hatchery Biological Opinion signed on 8/7/2014. NMFS issued an ESA 4(d) Rule Limit 5 Take Exemption in response to a revised HGMP on 6/17/2016. This program was also evaluated under the Mitchell Act Biological Opinion signed on 1/15/2017. This 2024 version is intended as re-submission for reinitiation of consultation under the Mitchell Act.

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.

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

Life Stage	Activity	Affected NMFS ESA-listed Population
Adult	Broodstock	Lower Columbia River Steelhead

- Identify the NMFS ESA-listed population(s) that may be <u>incidentally</u> 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	Lower Columbia Chinook Salmon
		Lower Columbia River Steelhead
		Lower Columbia River Coho Salmon
Juvenile	Screw Trap Operations	Lower Columbia Chinook Salmon
		Lower Columbia River Steelhead
		Lower Columbia River Coho Salmon
	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
		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 overlapping broodstock collection seasons at Sandy Hatchery and the low likelihood that listed populations will be affected through ecological competition, only assessments of listed populations affected annually by the Sandy Hatchery adult trap, Sandy Hatchery screw trap, and angler caught winter steelhead and spring Chinook broodstock program are presented here.

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

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Table 2.2.2.1 Description of listed population thresholds.

Affected NMFS ESA-listed Population	Status
Lower Columbia River Chinook Salmon	Moderate 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 Sandy spring Chinook, fall Chinook, winter steelhead, and Coho.

Year	Spring Chinook	Fall Chinook	Winter Steelhead	Coho
2012	1,150	6,260	527	3,494
2013	3,070	220	357	1,165
2014	2,284	9,327	3,509	667
2015	1,538	2,480	3,249	5,942
2016	2,840	NA	4,670	443
2017	3,479	4,725	5,488	939
2018	5,230	6,229	2,125	2,384
2019	2,758	12,496	5,981	537
2020	2,343	7,934	1,896	1,052
2021	4,533	20,824	2,634	601
2022	3,660	8,481	3,868	3,819
2023	6,000	9,886	4,388	7,152

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 Sandy spring Chinook, fall Chinook, winter steelhead, and Coho.

Year	Spring Chinook	Fall Chinook	Winter Steelhead	Coho

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2012	66.5%	7.2%	0.0%	8.4%
2013	23.7%	30.0%	0.0%	2.8%
2014	9.8%	2.5%	6.4%	11.8%
2015	12.8%	9.1%	2.8%	2.8%
2016	11.4%	NA	10.0%	4.5%
2017	4.9%	11.0%	5.9%	3.2%
2018	8.4%	0.0%	0.1%	0.0%
2019	6.9%	1.4%	8.5%	7.9%
2020	10.3%	0.5%	6.7%	0.0%
2021	12.8%	0.0%	4.9%	NA
2022	6.8%	5.4%	0.9%	0.0%
2023	4.8%	3.0%	1.7%	4.3%

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

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

- 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 adult coho, steelhead, and Chinook salmon captured associated with all programs at Sandy Hatchery, including angler caught broodstock from Jan. 1 – Dec. 31.

Calendar Year	Coho		Winter Steelhead		Chinook	
	Capture	Mortality	Capture	Mortality	Capture	Mortality
2015	63	0	54	0	18	0
2016	227	0	54	0	0	0
2017	388	0	15	0	51	2
2018	81	0	71	10	86	3
2019	362	0	82	3	60	3

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2020	601	0	81	0	51	3
2021	591	0	71	2	47	14
2022	832	0	104	4	41	3
2023	509	0	87	2	42	7
2024	943	0	89	0	45	2

Data Source: HMS and program records.

Table 2.2.3.2. Number of listed natural origin juvenile coho, steelhead, and Chinook salmon captured associated with the Sandy Hatchery screw trap from Jan. 1 – Dec. 31.

Calendar Year	Coho		Winter Steelhead		Chinook	
	Capture	Mortality	Capture	Mortality	Capture	Mortality
2015	66	0	10	0	24	0
2016	466	0	53	0	88	0
2017	124	0	69	0	3	0
2018[1]	146	0	2	0	0	0
2019[2]	-	-	-	-	-	-
2020	901	0	23	0	0	0
2021	950	0	83	0	0	0
2022	1,819	0	70	0	0	0
2023	1,581	0	97	0	0	0
2024	1,652	0	38	0	0	0

Data Source: Program records.

[1] Screw trap operations were limited midseason due to an unresolved property transfer precluding access to the trapping location.

[2] Screw trap was not in operation due to an unresolved property transfer precluding access to the trapping location.

- 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).

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

Listed Species: Coho	**ESU:** Lower Columbia River		**Activity:** Trapping	
Location: Sandy Hatchery	**Dates:** Jan 1 – Dec 31		**Operator:** ODFW	
	Annual Take of Listed Fish by Life Stage			
Type of Take	**Egg/Fry**	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass				

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Collect for transport				
Capture, handle, and release				
Capture, handle, tag/mark/tissue sample, and release		6000	2000	
Removal (e.g. broodstock)				
Intentional lethal take				
Unintentional lethal take		80	≤ 60	
Other Take (specify)				

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

Listed Species: Steelhead	**ESU:** Lower Columbia River		**Activity:** Trapping/Angling	
Location: Sandy Hatchery/Sandy Basin		**Dates:** Jan 1 – Dec 31		**Operator:** ODFW
	Annual Take of Listed Fish by Life Stage			
Type of Take	**Egg/Fry**	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass				
Collect for transport				
Capture, handle, and release				
Capture, handle, tag/mark/tissue sample, and release		3600	400	
Removal (e.g. broodstock)			50	
Intentional lethal take				
Unintentional lethal take		38	≤ 12	
Other Take (specify)				

Table 2.2.3.5. Estimated annual take levels of listed natural origin Chinook.

Listed Species: Chinook	**ESU:** Lower Columbia River		**Activity:** Trapping/Angling	
Location: Sandy Hatchery Sandy Basin		**Dates:** Jan 1 – Dec 31		**Operator:** ODFW
	Annual Take of Listed Fish by Life Stage			
Type of Take	**Egg/Fry**	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass				
Collect for transport				
Capture, handle, and release				
Capture, handle, tag/mark/tissue sample, and release		1000	200	
Removal (e.g. broodstock)			42	
Intentional lethal take				
Unintentional lethal take		30	≤ 6	

This program shall be implemented according to the Incidental Take Statement, Terms and Conditions, and Hatchery Operation Framework of the NMFS Mitchell Act Biological Opinion. Any deviation from the biological opinion must be approved by NMFS.

Other Take (specify)				

- 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 steelhead releases 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 Sandy River 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 egg to smolt 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.

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.

Sandy Hatchery – 28.54 cfs are authorized from Cedar Creek with an additional 3.23 acre-feet through storage. 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 the Sandy Hatchery adult traps via the fish ladder leading to a temporary holding pond. Natural-origin broodstock are also collected using hook and line by anglers.

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 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 Sandy Hatchery in a concrete raceway. Spawning is conducted under a covered platform.

5.4. Incubation facilities.
Eggs are incubated at Sandy Hatchery inside an incubation room via troughs with the capacity of 100,000 eggs. Flow through the trough incubators is 3-6 gpm.

5.5. Rearing facilities.
Juvenile winter steelhead are reared at Sandy Hatchery in circular tanks and concrete raceways.

5.6. Acclimation/release facilities.
Winter steelhead are volitionally released from Sandy Hatchery utilizing various sized raceways.

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 winter steelhead 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.

This program shall be implemented according to the Incidental Take Statement, Terms and Conditions, and Hatchery Operation Framework of the NMFS Mitchell Act Biological Opinion. Any deviation from the biological opinion must be approved by NMFS.

6.1. Source.

Broodstock for the Sandy Hatchery winter steelhead program (stock-11) were sourced from natural adult returns from various populations. Broodstock are currently sourced from returns to the Sandy River Basin.

6.2. Supporting information.

6.2.1. History.

The Sandy Hatchery winter steelhead program first began in 1955 utilizing natural adult returns from various populations. Localized broodstock collection began in 2000.

6.2.2. Annual size.

Up to 100 pairs for production plus additional as needed to support shortfalls in other programs

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

Up to 50 natural origin adults will be taken for broodstock. This program utilized 100% natural origin broodstock from 2000 – 2002.

6.2.4. Genetic or ecological differences.

Sandy hatchery winter steelhead are not likely to exhibit differences from the naturally produced Lower Columbia River steelhead due to the incorporation of natural origin broodstock.

6.2.5. Reasons for choosing.

Integration of local, natural origin winter steelhead 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 genetic divergence between the wild and hatchery populations, effectively mitigating for genetic risk.

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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 winter steelhead throughout the run. Broodstock may also be sourced via hook-and-line by anglers.

7.3. Identity.
Adipose fin clips are used to identify returning Sandy hatchery winter steelhead. Natural origin winter steelhead 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 1:1 sex ratio for adults)**
Up to 100 pairs for production plus additional as needed to support shortfalls in other programs. Up to 50 natural origin adults will be taken for broodstock.

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.

	Adults		
Brood Year	Females	Males	Pond Loss
2015	62	62	0
2016	116	116	5
2017	80	80	0
2018	79	79	20
2019	89	89	3
2020	85	85	0
2021	79	79	2
2022	68	68	4
2023	74	74	2
2024	86	86	0

Data source: HMS

7.5. Disposition of hatchery-origin fish collected in surplus of broodstock needs.
Surplus hatchery fish are distributed to the tribes, donated to foodbanks, recycled to the lower river for additional fishing opportunities, provided for educational purposes, distributed for stream enrichment, or disposed of.

7.6. Fish transportation and holding methods.
Adult winter steelhead collected for broodstock at Sandy Hatchery are held there until spawning.

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. Natural origin winter steelhead used for broodstock will be released after spawning.

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 unless there is a shortage of males. No residual males are utilized for spawning.

8.3. Fertilization.

This program intends to utilize 1:1 male-to-female ratios in 3x3 matrices, although alternative matrices will be utilized to maximize genetic diversity and the incorporation of natural genetics.

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. Eggs Taken and Survival Rates

Brood Year	Egg Take	Percent Survival to Eye-up
2011	315,121	90.3
2012	248,132	93.6
2013	290,285	96.6
2014	294,390	94.3
2015	295,269	90.5
2016	387,312	80.9
2017	328,003	87.8
2018	372,863	82.6
2019	420,883	88.8
2020	356,695	89.9

This program shall be implemented according to the Incidental Take Statement, Terms and Conditions, and Hatchery Operation Framework of the NMFS Mitchell Act Biological Opinion. Any deviation from the biological opinion must be approved by NMFS.

2021	418,982	86.2
2022	283,502	59.8
2023	316,034	78.9

Data source: HMS

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

Surplus eggs are typically collected to compensate for egg to smolt mortality and IHNV culling. If necessary, eggs are culled according to ODFW and IHOT guidelines.

9.1.3. Loading densities applied during incubation.

The average size of steelhead eggs is about 152 – 204 eggs per ounce. Water flows at 3-6 gmp through incubators. Each vertical incubating tray is loaded with up to 12,000 eggs.

9.1.4. Incubation conditions.

The water temperature and flow are monitored daily with a range of 37º – 53ºF at 3-6 gpm. Dissolved oxygen (DO) ranges between 10 and 11 parts per million (ppm) at Sandy Hatchery.

9.1.5. Ponding.

Fry are manually relocated once 100% buttoned up.

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 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.

9.1.7. 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 with water that meets IHOT water quality standards. 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 (1988-99), or for years dependable data are available.

Table 9.2.1 Rearing survival rates.

Brood Year	Number of Fry Ponded	Number of Juveniles at Marking	Percent Survival to Marking
2011	197,558	147,410	74.6
2012	205,319	97,817	47.6
2013	198,052	170,643	86.2
2014	198,138	164,077	82.8
2015	256,352	173,414	67.6
2016	232,193	148,929	64.1
2017	241,836	197,748	81.8
2018	209,538	217,135	103.6
2019	272,550	191,082	70.1
2020	275,254	131,757	47.9
2021	286,049	96,783	33.8
2022	159,548	110,306	69.1
2023	244,192	142,872	58.5

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.

9.2.3. Fish rearing conditions

Water temperatures range from 49º – 53ºF. Dissolved oxygen is only monitored when rearing densities are elevated.

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.

Table 9.2.4. Average end-of-month size

Month	Size (fpp)
1	1795.4
2	927.1
3	339.5
4	149.3
5	74.3
6	45.2
7	31.3
8	19.5
9	15.1
10	12.0
11	9.8
12	8.1

Data source: HMS

9.2.5. Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.
See Table 9.2.4 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.

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.

Table 10.1. Proposed fish release levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Yearling	170,000[1]	6.0 fpp	April - May	Cedar Creek

[1] The program may exceed the release goal by 5% annually (178,500) and 2% over any 5-year period (173,400) to account for variation during rearing.

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

Stream, river, or watercourse: Cedar Creek
Release point: RM 0.075
Major watershed: Sandy River
Basin or Region: Lower Columbia

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

Table 10.3. Program releases.

Brood Year	Number of Yearling Released	Average Size (fpp)
2011	141,063	6.3
2012	89,964	6.2
2013	161,786	6.1
2014	153,387	6.5
2015	152,665	6.8
2016	147,467	9.9
2017	159,444	9.0
2018	135,002	8.9
2019	159,137	7.3

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Brood Year	Number of Yearling Released	Average Size (fpp)
2020	158,991	7.8
2021	96,001	7.2
2022	106,001	9.6
2023	141,783	8.2
Average	**138,669**	**7.7**

Data source: HMS

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

Table 10.4. Annual release dates.

Brood Year	Release Date Range
2011	4/12
2012	4/15
2013	4/14
2014	4/13
2015	4/18
2016	4/25
2017	3/29
2018	4/16
2019	4/23
2020	4/15
2021	4/18
2022	4/17
2023	4/15

Data Source: HMS

10.5. Fish transportation procedures, if applicable.

All juveniles are transported in liberation trucks described above.

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

Juveniles reared and released at Sandy Hatchery do not require additional acclimation.

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

The program goal is to mass mark 100% of juveniles with an adipose fin clip and majority retain their marks.

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 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 at sufficient sizes to minimize potential interactions during emigration and adult homing.

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 FMEP	N/A
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. 2014. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion, Section 7(a)(2) Not Likely to Adversely Affect Determination, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Sandy River Spring Chinook Salmon, Coho Sahnon, Winter Steelhead, and Summer Steelhead Hatchery Programs. August 7, 2014. NMFS Consultation No:. WCR-2014- 300. 200p.

This program shall be implemented according to the Incidental Take Statement, Terms and Conditions, and Hatchery Operation Framework of the NMFS Mitchell Act Biological Opinion. Any deviation from the biological opinion must be approved by NMFS.

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.

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/

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.