



**UNITED STATES DEPARTMENT OF COMMERCE**  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
West Coast Region  
1201 NE Lloyd Boulevard, Suite 1100  
PORTLAND, OR 97232-1274

September 28, 2015

MEMORANDUM FOR: Chris Yates  
Assistant Regional Administrator  
Protected Resources Division

FROM: Rob Jones *Rob Jones*  
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Sustainable Fisheries Division

SUBJECT: 2015 5-Year Review – Listing Status under the Endangered  
Species Act for Hatchery Programs Associated with 28 Salmon  
Evolutionarily Significant Units and Steelhead Distinct Population  
Segments

The Sustainable Fisheries Division has completed its review of West Coast salmon and steelhead hatchery programs to assist the West Coast Region's 5-year Reviews under Section 4(c)(2)(A) of the Endangered Species Act (ESA). Our intent during this review was to 1) clarify the listing criteria and 2) update the listing status of hatchery programs in each listed Evolutionarily Significant Unit (ESU) and Distinct Population Segment (DPS).

Programs with a category 1 or 2 designation are included in an ESU/DPS and listed under the ESA, while programs with a category 3 or 4 designation are not included and not listed. NMFS considers the origin of the hatchery population/stock and the divergence level of the hatchery population from the source population when designating categories (NMFS 2003; Table 1). Our evaluation has identified 26 programs for which we recommend a change in ESU/DPS inclusion (Table 2). Our recommendation is informed by a number of sources including:

- Salmon Steelhead Hatchery Assessment Group (SSHAG; NMFS 2003; Hard et al. 2007)
- Salmonid Hatchery Inventory and Effects Evaluation Report (SHIEER; NMFS 2004)
- Hatchery Listing Policy (NMFS 2005)
- 2010 ESA Status Review Memorandum (Jones 2011)
- Hatchery and Genetic Management Plans
- Expert opinion

All artificial propagation programs within the boundaries of ESA-listed ESUs/DPSs in the states of Washington, Oregon, Idaho, and California can be found in Table 4. Programs that require further explanation are marked with an asterisk and are accompanied by a write-up following the table.

Table 1. Summary of hatchery categorization system modified from NMFS (2003) for clarity. Programs with a category 1 or 2 designation are included in an ESU/DPS while programs with a category 3 or 4 designation are not.

		Hatchery stock source and local population status at release site			
		Source from local, native natural population	Source non-local but within ESU/DPS; no native local natural population	Source non-local but within ESU/DPS; native local natural population exists	Source non-local and predominantly from outside of ESU/DPS
Relationship to source population	Minimal divergence	1a	1b	NA	4
	Moderate divergence*	2a	2b	2c	
	Substantial divergence**	3a	3b	3c	
	Extreme divergence***	4			

\* Moderate divergence is no more than divergence observed between similar populations within ESU/DPS

\*\* Substantial divergence is comparable to divergence observed within entire ESU/DPS

\*\*\* Extreme divergence is greater than divergence observed within ESU/DPS or substantial artificial selection or manipulation

Table 2. Programs with a recommended change in ESU/DPS inclusion.

<b>ESU/DPS</b>	<b>Hatchery Program</b>	<b>Add or Remove from listing?<sup>1</sup></b>
Puget Sound Chinook	Bernie Kai-Kai Gobin (Tulalip) Hatchery-Cascade	Add
	North Fork Skokomish River Spring-run	Add
	Rick's Pond Hatchery	Remove
	Icy Creek Hatchery-included in Soos Creek program	Remove
Hood Canal Summer Chum	Hamma Hamma Fish Hatchery	Remove
	Jimmycomelately Creek Fish Hatchery	Remove
Puget Sound Steelhead	Fish Restoration Facility	Add
Lower Columbia River Chinook	Deep River Net Pens-Washougal	Add
	Klaskanine Hatchery	Add
	Bonneville Hatchery	Add
	Cathlamet Channel Net Pens	Add
Lower Columbia River Coho	Clatsop County Fisheries	Add
	Clatsop County Fisheries/Klaskanine Hatchery	Add
Columbia River Chum	Big Creek Hatchery	Add
Lower Columbia River Steelhead	Upper Cowlitz Wild	Add
	Tilton River Wild	Add
Snake River Spring/Summer Chinook	Yankee Fork	Add
	Dollar Creek	Add
	Panther Creek	Add
Snake River Steelhead	East Fork Salmon River	Add
	Squaw Creek	Add
	Little Salmon River	Add
	South Fork Clearwater Hatchery	Add
Upper Columbia River Spring Chinook	Nason Creek	Add
	Chewuch River-included in the Methow Composite	Remove
California Central Valley Steelhead	Mokelumne River Hatchery	Add

<sup>1</sup>Listed programs that have been terminated and for which all adults are likely to have returned are recommended for removal from the listing.

Table 3. Programs with a name change.

<b>ESU/DPS</b>	<b>Current Name</b>	<b>New Name<sup>1</sup></b>
Ozette Lake Sockeye	Umbrella Creek Hatchery	Combine into one: Umbrella Creek/Big River Hatcheries
	Big River Hatchery	
Puget Sound Chinook	Soos Creek Hatchery	Soos Creek Hatchery (subyearlings and yearlings)
	Keta Creek Hatchery	Fish Restoration Facility
	Tulalip Bay Program	Bernie Kai-Kai Gobin (Tulalip) Hatchery-Skykomish
	Hupp Springs Hatchery	Hupp Springs Hatchery-Adult Returns to Minter Creek
Upper Columbia River Steelhead	Omak Creek	Okanogan River
Snake River Fall Chinook	Oxbow Hatchery	Idaho Power
Snake River Spring/Summer-run Chinook	Big Sheep Creek	Big Sheep Creek-Adult outplanting from Imnaha program
Upper Willamette River Chinook	Marion Forks Hatchery/North Fork Santiam River	North Santiam River
	South Santiam Hatchery in the Mollala River	Mollala River

<sup>1</sup>Oregon Department of Fish and Wildlife stock numbers have been eliminated from all program names, but all the programs where this applies may not be shown in this table.

Table 4. ESA Status of hatchery programs in Washington (WA), Oregon (OR), Idaho (ID) and California (CA) within listed ESUs/DPSs. Programs with an asterisk are discussed further following the table; NA = not applicable, NF = North Fork, SF = South Fork, MF = Middle Fork, EF = East Fork, NFH = National Fish Hatchery, SBT = Shoshone-Bannock Tribes of Idaho.

Program Stock Origin <sup>1,2</sup>	Artificial Propagation Program	Run	Watershed Location of Release (State)	Currently in Listed ESU/DPS?	Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)	SSHAG Category
<b>Ozette Lake Sockeye Salmon ESU</b>						
Umbrella Creek	Umbrella Creek/Big River Hatcheries	N/A	Lake Ozette (WA)	Yes	No	1a/b or 2a/b
<b>Puget Sound Chinook Salmon ESU</b>						
NF Nooksack	Kendall Creek Hatchery	Spring	Nooksack River (WA)	Yes	No	2a
SF Nooksack	Skookum Creek Hatchery	Spring	Nooksack River (WA)	Yes	No	1
Cascade	Marblemount Hatchery Subyearlings	Spring	Cascade River (WA)	Yes	No	2c
	NF Skokomish River*	Spring	Skokomish River (WA)	No	No	2b
	Bernie Kai-Kai Gobin (Tulalip) Hatchery*	Spring	Snohomish River/Tulalip Bay (WA)	No	No	2c
Upper Skagit	Marblemount Hatchery	Summer	Skagit River (WA)	Yes	No	1a
NF Stillaguamish	Harvey Creek Hatchery	Summer	Stillaguamish River (WA)	Yes	No	1a
	Whitehorse Springs Pond	Summer	Stillaguamish River (WA)	Yes	No	1a
SF Stillaguamish	Harvey Creek Hatchery	Fall	Stillaguamish River (WA)	Yes	No	1
Skykomish	Wallace River Hatchery Yearlings	Summer	Skykomish River (WA)	Yes	No	2a

<sup>1</sup> Full details regarding the origin of the hatchery stocks propagated through each program can be found in NMFS (2003), Hard et al. (2007), and Jones (2011).

<sup>2</sup> The term “localized” refers to a stock that has been released into a new location and has subsequently adapted to the new location with adult returns sufficient to sustain the hatchery program. This adaptation has led to divergence from the population/stock of origin.

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
	Wallace River Hatchery Subyearlings	Summer	Skykomish River (WA)	Yes	No	2a
	Bernie Kai-Kai Gobin (Tulalip) Hatchery	Summer	Skykomish River/Tulalip Bay (WA)	Yes	No	2a
Sammamish	Issaquah Hatchery	Fall	Cedar River (WA)	Yes	No	2b
Green	Soos Creek Hatchery Subyearlings	Fall	Green River (WA)	Yes	No	2a
	Soos Creek Hatchery Yearlings	Fall	Green River (WA)	Yes	No	2a
	Fish Restoration Facility	Fall	Green River (WA)	Yes	No	2a
White	White River Hatchery	Spring	White River (WA)	Yes	No	2a
	White Acclimation Ponds	Spring	White River (WA)	Yes	No	2a
	Hupp Springs Hatchery- adult returns to Minter Creek	Spring	Minter Creek, Carr Inlet (WA)	Yes	No	2a
Puyallup	Voights Creek Hatchery	Fall	Puyallup River (WA)	Yes	No	2b/c
	Diru Creek	Fall	Puyallup River (WA)	Yes	No	2b/c
Nisqually	Clear Creek Hatchery	Fall	Nisqually River (WA)	Yes	No	2b/c
	Kalama Creek Hatchery	Fall	Nisqually River (WA)	Yes	No	2b/c
Skokomish	George Adams Hatchery	Fall	Skokomish River (WA)	Yes	No	2b/3c
	Rick’s Pond Hatchery	Fall	Skokomish River (WA)	Yes	Yes (2016)	NA
George Adams Hatchery and Hamma Hamma River	Hamma Hamma Hatchery	Fall	Hamma Hamma River (WA)	Yes	No	2b/3c

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Dungeness	Dungeness/Hurd Creek Hatchery	Spring	Dungeness River (WA)	Yes	No	1a
Elwha	Elwha Channel Hatchery	Fall	Elwha River (WA)	Yes	No	2a
Green (localized)	Lummi Bay Hatchery	Fall	Nooksack River (WA)	No	No	3b/c
	Samish Hatchery	Fall	Samish River (WA)	No	No	3b
	Bernie Kai-Kai Gobin (Tulalip) Hatchery	Fall	Snohomish River/Tulalip Bay (WA)	No	Yes (2008)	NA
	UW Portage Bay Hatchery	Fall	Lake Washington (WA)	No	Yes (2008)	NA
	Grovers Creek Hatchery and Satellite Rearing Ponds*	Fall	East Kitsap (WA)	No	No	2b
	Garrison Springs/Chambers Creek Hatcheries*	Fall	Chambers Creek (WA)	No	No	2b
	Minter Creek Hatchery*	Fall	Minter Creek, Carr Inlet (WA)	No	No	2b
	Tumwater Falls/Percival Cove*	Fall	Deschutes River (WA)	No	No	2b
	Hoodsport (Finch Creek) Hatchery*	Fall	South Hood Canal (WA)	No	No	2b/3c
<b>Hood Canal Summer-run Chum ESU</b>						
Hamma Hamma	Hamma Hamma Fish Hatchery	Summer	Hamma Hamma River (WA)	Yes	Yes (2013)	NA
Lilliwaup Creek	Lilliwaup Creek Fish Hatchery	Summer	Southwestern Hood Canal (WA)	Yes	No	1a
Union (stock reintroduction)	Tahuya River Fish Hatchery	Summer	Tahuya River (WA)	Yes	No	1a

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Jimmycomelately	Jimmycomelately Creek Fish Hatchery	Summer	Sequim Bay (WA)	Yes	Yes (2015)	NA
<b>Puget Sound Steelhead DPS</b>						
Green	Green River Natural	Winter	Green River (WA)	Yes	No	1/2
	Fish Restoration Facility*	Winter	Green River (WA)	No	No	1a
White	White River Supplementation	Winter	White River (WA)	Yes	No	1
East Hood Canal Tributaries	Hood Canal Supplementation-Dewatto River (off-station)	Winter	West Kitsap, Hood Canal (WA)	Yes	Yes (2019)	NA
Skokomish	Hood Canal Supplementation-Skokomish River (off-station)	Winter	SF Skokomish River (WA)	Yes	Yes (2019)	NA
West Hood Canal Tributaries	Hood Canal Supplementation-Duckabush River (off-station)	Winter	Duckabush River (WA)	Yes	Yes (2019)	NA
Elwha	Lower Elwha Fish Hatchery Wild Recovery	Winter	Elwha River (WA)	Yes	No	1
Chambers Creek (South Puget Sound) Lineage	Whatcom Creek Hatchery (off-station)	Winter	Samish River (WA)	No	Yes (2012)	NA
	Kendall Creek Hatchery	Winter	Nooksack River (WA)	No	No <sup>3</sup>	3
	Marblemount Hatchery	Winter	Skagit River (WA)	No	Yes (2016)	NA

<sup>3</sup>Smolt releases on hiatus pending NMFS determinations regarding program effects on ESA-listed fish.



<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
	Barnaby Slough	Winter	Skagit River (WA)	No	Yes (2009)	NA
	Whitehorse Pond	Winter	Stillaguamish River (WA)	No	No <sup>3</sup>	3
	Tokul Creek Hatchery	Winter	Snoqualmie River (WA)	No	No <sup>3</sup>	3
	Reiter Ponds Hatchery	Winter	Skykomish and Pilchuck Rivers (WA)	No	No <sup>3</sup>	3
	Dungeness Hatchery	Winter	Dungeness River (WA)	No	No <sup>3</sup>	3
	Lower Elwha Tribe Hatchery	Early Winter	Elwha River (WA)	No	Yes (2014)	NA
	Soos Creek Hatchery	Winter	Green River (WA)	No	No <sup>3</sup>	3
Skamania (Columbia River) Hatchery Lineage	Whitehorse Pond	Summer	Stillaguamish River (WA)	No	No	4
	Reiter Ponds Hatchery	Summer	Skykomish, Sultan, and Raging Rivers (WA)	No	No	4
	Soos Creek Hatchery	Summer	Green River (WA)	No	No	4
<b>Lower Columbia River Chinook ESU</b>						
Big Creek	Big Creek*	Tule Fall	Big Creek (OR)	Yes	No	3b
	Astoria High School (STEP)*	Tule Fall	Big Creek (OR)	Yes	No	3b
	Warrenton High School (STEP)*	Tule Fall	Big Creek (OR)	Yes	No	3b
	Klaskanine Hatchery*	Tule Fall	Klaskanine River (OR)	No	No	3b
Cowlitz	Cowlitz	Tule Fall	Lower Cowlitz River (WA)	Yes	No	2a
Cowlitz/Toutle	North Fork Toutle	Tule Fall	Cowlitz River (WA)	Yes	No	2c
Kalama	Kalama	Tule Fall	Kalama River (WA)	Yes	No	2a
Washougal	Washougal River	Tule Fall	Washougal River (WA)	Yes	No	2a/b

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	Deep River Net Pens*	Tule Fall	Deep River (WA)	No	No	2c
Big White Salmon (Spring Creek NFH)	Spring Creek NFH	Tule Fall	Upper Columbia River Gorge (WA)	Yes	No	2a
	Bonneville Hatchery*	Tule Fall	Lower Columbia River Gorge (OR)	No	No	2c
	Little White Salmon NFH	Tule Fall	Lower Columbia River Gorge (OR)	No	Yes (2017)	NA
Cowlitz	Cowlitz	Spring	Upper Cowlitz and Cispus Rivers (WA)	Yes	No	2a
	Friends of Cowlitz	Spring	Upper Cowlitz River (WA)	Yes	No	2a
	Cathlamet Channel Net Pens*	Spring	Lower Columbia mainstem	No	No	2b
Kalama/Cowlitz/Lewis	Kalama River	Spring	Kalama River (WA)	Yes	No	2a/b
Lewis	Lewis River	Spring	Lewis River (WA)	Yes	No	2a/b
	Fish First	Spring	Lewis River (WA)	Yes	No	2a/b
Sandy	Sandy River Hatchery	Spring	Sandy River (OR)	Yes	No	1a
Rogue	Clatsop County Fisheries Select Area Brights	Fall	Youngs Bay (OR)	No	No	4
Willamette <sup>4</sup>	Clatsop County Fisheries	Spring	Youngs Bay (OR)	No	No	4
Carson Stock	Carson NFH	Spring	Upper Columbia River Gorge (WA)	No	No	4
	Little White Salmon NFH	Spring	Upper Columbia River Gorge (WA)	No	No	4

<sup>4</sup> Willamette River Chinook are listed within the Willamette River Chinook ESU, but they are not listed within the Lower Columbia River Chinook ESU.

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Mid-Columbia Upriver Bright	Little White Salmon NFH	Fall	Upper Columbia River Gorge (WA)	No	No	4
	Bonneville Hatchery	Fall	Lower Columbia River Gorge (OR)	No	Yes (2018)	NA
Deschutes/Hood	Hood River	Spring	Hood River (OR)	No	No	4
Lewis/Cowlitz	Deep River Net-Pens	Spring	Grays River (WA)	No	Yes (2016)	NA
<b>Lower Columbia River Coho ESU</b>						
Type-N stock complex	Grays River*	Type-N	Grays River (WA)	Yes	No	2a
	Peterson*	Type-N	Grays River (WA)	Yes	No	2a
	Kalama River	Type-N	Kalama River (WA)	Yes	No	2c
	Lewis River	Type-N	NF Lewis River (WA)	Yes	No	2c
	Washougal River	Type-N	Washougal River (WA)	Yes	No	2c
Big Creek Natural	Big Creek Hatchery	N/A	Big Creek (OR)	Yes	No	2a
	Astoria High School (STEP)	N/A	Youngs Bay (OR)	Yes	No	2a
	Warrenton High School (STEP)	N/A	Youngs Bay (OR)	Yes	No	2a
	Clatsop County Fisheries/Klaskanine Hatchery*	N/A	SF Klaskanine River (OR)	No	No	2c
Cowlitz	Cowlitz	Type-N	Upper Cowlitz River (WA)	Yes	No	2a
	Cowlitz	Type-N	Lower Cowlitz River (WA)	Yes	No	2a
	Cowlitz Game and Anglers	Type-N	Lower Cowlitz River (WA)	Yes	No	2a
	Friends of the Cowlitz	Type-N	Lower Cowlitz River (WA)	Yes	No	2a

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If "yes", list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Toutle	NF Toutle River Hatchery	Type-S	Cowlitz River (WA)	Yes	No	2a
Type-S stock complex	Kalama River	Type-S	Kalama River (WA)	Yes	No	2c/3c
	Lewis River	Type-S	NF Lewis River (WA)	Yes	No	2c/3c
Lewis Type-N	Fish First	Type-N	NF Lewis River (WA)	Yes	No	2a
	Fish First Wild	Type-N	NF Lewis River (WA)	Yes	No	2a
	Syverson Project	Type-N	Salmon Creek (WA)	Yes	No	2a
Clackamas	Eagle Creek NFH	N/A	Clackamas River (OR)	Yes	No	2c
Sandy	Sandy Hatchery	Late	Sandy River (OR)	Yes	No	2a
Tanner Creek	Bonneville/Cascade/Oxbow Complex	N/A	Lower Columbia River Gorge (OR)	Yes	No	2b
	Clatsop County Fisheries*	N/A	Youngs Bay (OR)	No	No	2c
<b>Columbia River Chum ESU</b>						
Grays	Grays River	Fall	Grays River (WA)	Yes	No	1a
Mainstem Columbia	Washougal River Hatchery/Duncan Creek	Fall	Washougal River (WA)	Yes	No	1a
Big Creek	Big Creek Hatchery*	Fall	Big Creek (WA)	No	No	2a
<b>Lower Columbia River Steelhead DPS</b>						
Cowlitz	Cowlitz Trout Hatchery	Late Winter	Lower Cowlitz River (WA)	Yes	No	2a
Upper Cowlitz	Upper Cowlitz River Wild*	Late Winter	Upper Cowlitz River (WA)	No	No	1a
Tilton River	Tilton River Wild*	Late Winter	Upper Cowlitz River (WA)	No	No	1a
Clackamas	Clackamas Hatchery	Late Winter	Clackamas River (OR)	Yes	No	1a
Sandy	Sandy Hatchery	Late Winter	Sandy River (OR)	Yes	No	1a
Lewis	Lewis River Wild	Late Winter	Lewis River (WA)	Yes	No	1a

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Kalama	Kalama River Wild	Winter	Kalama River (WA)	Yes	No	1a
	Kalama River Wild	Summer	Kalama River (WA)	Yes	No	1a
Hood	Hood River	Winter	Hood River (OR)	Yes	No	1a
Skamania	Cowlitz	Summer	Lower Cowlitz River (WA)	No	No	4
	Friends of the Cowlitz	Summer	Lower Cowlitz River (WA)	No	No	4
	Cowlitz Game and Anglers	Summer	SF Toutle River (WA)	No	No	4
	North Toutle	Summer	NF Toutle River (WA)	No	Yes (2018)	NA
	Kalama River	Summer	Kalama River (WA)	No	No	4
	Merwin	Summer	NF Lewis River (WA)	No	No	4
	Fish First	Summer	NF Lewis River (WA)	No	No	4
	Speelyai Bay Net-Pen	Summer	NF Lewis River (WA)	No	No	4
	EF Lewis	Summer	EF Lewis River (WA)	No	Yes (2018)	NA
	Skamania	Summer	Washougal River (WA)	No	No	4
Chambers Creek	Kalama River	Winter	Kalama River (WA)	No	No	4
	Cowlitz Early	Winter	Lower Cowlitz River (WA)	No	Yes (2014)	NA
	Merwin Winter	Winter	NF Lewis River (WA)	No	No	4
	Coweeman Ponds	Winter	Coweeman River (WA)	No	No	4
	EF Lewis	Winter	EF Lewis River (WA)	No	Yes (2018)	NA
	Skamania	Winter	Washougal River (WA)	No	No	4
	Kliline Ponds	Winter	Salmon Creek (WA)	No	No	4
Big Creek	Eagle Creek NFH	Winter	Clackamas River (OR)	No	No	4
Santiam	Clackamas	Summer	Clackamas River (OR)	No	No	4
	Sandy River	Summer	Sandy River (OR)	No	No	4

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If "yes", list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
<b>Middle Columbia River Steelhead DPS</b>						
Touchet River	Touchet River Endemic	Summer	Touchet River (WA)	Yes	No	1a
Yakima River	Yakima River Kelt Reconditioning	Summer	Satus Creek (WA)	Yes	No	1a
		Summer	Toppenish Creek (WA)	Yes	No	1a
		Summer	Naches River (WA)	Yes	No	1a
		Summer	Upper Yakima River (WA)	Yes	No	1a
Umatilla	Umatilla River	Summer	Umatilla River (OR)	Yes	No	1a
Deschutes River	Deschutes River	Summer	Deschutes River (OR)	Yes	No	2a/c
Wallowa stock	Lyons Ferry NFH	Summer	Touchet River (WA)	No	No	4
	Walla Walla River Release	Summer	Walla Walla River (WA)	No	No	4
Skamania	Skamania Stock Release	Summer	Klickitat River (WA)	No	No	4
	Skamania Stock Release	Winter	Rock Creek (above Bonneville Dam, WA)	No	No	4
<b>Snake River Fall-run Chinook ESU</b>						
Snake River Basin	Lyons Ferry NFH	Fall	Snake River (ID)	Yes	No	2a
	Acclimation Ponds Program	Fall	Snake River (ID)	Yes	No	2a
	Nez Perce Tribal Hatchery	Fall	Snake and Clearwater rivers (ID)	Yes	No	2a
	Idaho Power	Fall	Snake River (OR, ID)	Yes	No	2a
<b>Snake River Spring/Summer-run Chinook ESU</b>						
Tucannon	Tucannon River	Spr/Sum	Tucannon River (WA)	Yes	No	1a
Lostine	Lostine River	Spr/Sum	Lostine River (OR)	Yes	No	1a

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Catherine Creek	Catherine Creek	Spr/Sum	Catherine Creek (OR)	Yes	No	1a
Lookingglass	Lookingglass Hatchery Reintroduction*	Spr/Sum	Lookingglass Creek (OR)	Yes	No	1b
Upper Grand Ronde	Upper Grande Ronde	Spr/Sum	Upper Grande Ronde (OR)	Yes	No	1a
Imnaha	Imnaha River	Spr/Sum	Imnaha River (OR)	Yes	No	1a
	Big Sheep Creek-Adult outplanting from Imnaha program	Spr/Sum	Imnaha River (OR)	Yes	No	1a
SF Salmon	McCall Hatchery	Summer	SF Salmon River (ID)	Yes	No	1a
	Dollar Creek SBT*	Spring	SF Salmon River (ID)	No	No	1a
Johnson Creek	Johnson Creek Artificial Propagation Enhancement	Summer	EF/SF Salmon River (ID)	Yes	No	1a
Pahsimeroi	Pahsimeroi Hatchery*	Summer	Salmon River (ID)	Yes	No	1a
	Panther Creek*	Summer	Salmon River (ID)	No	No	1b
Sawtooth	Sawtooth Hatchery	Spring	Upper Mainstem Salmon River (ID)	Yes	No	1a
Sawtooth/Pahsimeroi	Yankee Fork SBT*	Spring	Yankee Fork (ID)	No	No	1b
Rapid	Rapid River Hatchery	Spring	Little Salmon River (ID)	No	No	3c
Dworshak stock/Clearwater River	Dworshak NFH*	Spring	NF Clearwater (ID)	No	No	4
	Kooskia*	Spring	Mainstem Clearwater (ID)	No	No	4
	Clearwater Hatchery*	Spring	Mainstem Clearwater (ID)	No	No	4
	Nez Perce Tribal Hatchery*	Spring	Mainstem Clearwater (ID)	No	No	4

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
<b>Snake River Basin Steelhead DPS</b>						
Tucannon	Tucannon River	Summer	Tucannon River (WA)	Yes	No	1a
Imnaha	Little Sheep Creek/Imnaha River Hatchery	Summer	Imnaha River (OR)	Yes	No	2a
EF Salmon	EF Salmon River	A	EF Salmon River (ID)	Yes	No	1a
NF Clearwater/Dworshak stock	Dworshak NFH*	B	Clearwater River (ID)	Yes	No	2a
	Lolo Creek*	B	Clearwater River (ID)	Yes	No	2a
	Clearwater Hatchery*	B	NF Clearwater River (ID)	Yes	No	2a
	EF Salmon River*	B	EF Salmon River (ID)	No	No	2c
	Squaw Creek*	B	Squaw Creek (ID)	No	No	2c
	Little Salmon River*	B	Little Salmon River (ID)	No	No	2c
SF Clearwater	SF Clearwater (localized)*	B	SF Clearwater River (ID)	Yes	No	2c
Wallowa stock	Lyons Ferry NFH	Summer	Tucannon River (WA)	No	No	3c
	Cottonwood Pond	Summer	Grand Ronde (OR)	No	No	3c
	Wallowa Hatchery and Big Canyon Satellite Pond	Summer	Wallowa River (OR)	No	No	3c
Hells Canyon/Oxbow (ID)	Lower Snake and Hells Canyon Mitigation*	A	Snake River (ID)	No	No	3c
Sawtooth/Pahsimeroi	Pahsimeroi Hatchery	A	Pahsimeroi River (ID)	No	No	3c
	Sawtooth Hatchery	A	Upper Salmon River (ID)	No	No	3c
	Streamside Incubator Project	A	Upper Salmon River (ID)	No	No	3c
	Little Salmon Steelhead	A	Little Salmon River (ID)	No	No	3c
	Yankee Fork	A	Upper Salmon River (ID)	No	No	3c



<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If "yes", list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
<b>Snake River Sockeye Salmon ESU</b>						
Redfish Lake	Redfish Lake Captive Broodstock	N/A	Upper Salmon River (ID)	Yes	No	1a
<b>Upper Columbia River Spring-run Chinook ESU</b>						
Twisp	Twisp River	Spring	Methow River (WA)	Yes	No	1a
Methow Composite	Methow Conservation	Spring	Methow River (WA)	Yes	No	2a
	Winthrop NFH*	Spring	Methow River (WA)	Yes	No	2a
Nason Creek	Nason Creek*	Spring	Wenatchee River (WA)	No	No	1a
Chiwawa	Chiwawa River	Spring	Wenatchee River (WA)	Yes	No	1a
White	White River	Spring	Wenatchee River (WA)	Yes	No	1a
Carson stock	Leavenworth NFH	Spring	Wenatchee River (WA)	No	No	3c/4
<b>Upper Columbia River Steelhead DPS</b>						
Wenatchee	Wenatchee River	Summer	Wenatchee River (WA)	Yes	No	1b
Okanogan	Okanogan River*	Summer	Okanogan River (WA)	Yes	No	2b
Wells stock	Wells Hatchery	Summer	Methow River (WA)	Yes	No	2b
	Winthrop NFH	Summer	Methow River (WA)	Yes	No	2b
	Ringold Hatchery	Summer	Middle Columbia River (WA)	Yes	No	2b
<b>Upper Willamette River Chinook ESU</b>						
McKenzie	McKenzie River	Spring	McKenzie River (OR)	Yes	No	2a
NF Santiam/McKenzie	North Santiam	Spring	NF Santiam River (OR)	Yes	No	2a/b
North Santiam	Mollala	Spring	Molalla River (OR)	Yes	No	2a/b
Santiam	South Santiam	Spring	SF Santiam River (OR)	Yes	No	2b

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If “yes”, list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Willamette	MF Willamette	Spring	MF Willamette River (OR)	Yes	No	2b/c
Upper Willamette	Clackamas	Spring	Clackamas River (OR)	Yes	No	2b/c
<b>Upper Willamette River Steelhead ESU</b>						
Skamania	Upper Willamette	Summer	South Santiam River, North Santiam, McKenzie, MF Willamette (OR)	No	No	4
<b>Oregon Coast Coho ESU</b>						
Umpqua	Cow Creek	N/A	SF Umpqua River (OR)	Yes	No	2a
Trask	Trask	N/A	Trask River (OR)	No	No	2c/3c
Nehalem	North Fork Nehalem*	N/A	NF Nehalem River (OR)	No	No	3c
<b>Sacramento River Winter-run Chinook ESU</b>						
Sacramento	Livingston Stone NFH Captive Broodstock	Winter	Sacramento River (CA)	Yes	No	1a
	Livingston Stone NFH	Winter	Sacramento River (CA)	Yes	No	1a
<b>Central Valley Spring-run Chinook ESU</b>						
Feather	Feather River Hatchery*	Spring	Feather River (CA)	Yes	No	2a
<b>California Coastal Chinook ESU</b>						
None						
<b>Southern Oregon Northern California Coastal Coho ESU</b>						
Rogue	Cole River Hatchery	N/A	Rogue River (OR)	Yes	No	2a
Klamath	Iron Gate Hatchery	N/A	Klamath River (CA)	Yes	No	2c

<b>Program Stock Origin<sup>1,2</sup></b>	<b>Artificial Propagation Program</b>	<b>Run</b>	<b>Watershed Location of Release (State)</b>	<b>Currently in Listed ESU/DPS?</b>	<b>Program Terminated? (If "yes", list last year of hatchery-origin adult returns)</b>	<b>SSHAG Category</b>
Trinity	Trinity River Hatchery	N/A	Trinity River (CA)	Yes	No	2b
<b>Central California Coastal Coho ESU</b>						
Russian River	Don Clausen Fish Hatchery Captive Broodstock	N/A	Russian River (CA)	Yes	No	1a
Scott Creek	Scott Creek Captive Broodstock/ Kingfisher Flat Hatchery	N/A	Scott Creek (CA)	Yes	No	1a
<b>Northern California Steelhead DPS</b>						
Eel/Mad	Mad River Hatchery*	Winter	Mad River (CA)	No	No	4
<b>Central California Coast Steelhead DPS</b>						
Russian	Don Clausen Fish Hatchery/ Coyote Valley Fish Facility	Winter	Russian River (CA)	Yes	No	2a
San Lorenzo	Kingfisher Flat Hatchery	Winter	San Lorenzo River (CA)	Yes	No	1a
<b>California Central Valley Steelhead DPS</b>						
Sacramento	Coleman NFH	Winter	Sacramento River (CA)	Yes	No	2a
Feather	Feather River Hatchery	Winter	Feather River (CA)	Yes	No	2a
Eel	Nimbus Hatchery	Winter	American River (CA)	No	No	4
Feather	Mokelumne River Hatchery*	Winter	Mokelumne River (CA)	No	No	2c

Program Stock Origin <sup>1,2</sup>	Artificial Propagation Program	Run	Watershed Location of Release (State)	Currently in Listed ESU/DPS?	Program Terminated? (If "yes", list last year of hatchery-origin adult returns)	SSHAG Category
<b>South-Central California Coast Steelhead DPS</b>						
None						
<b>Southern California Steelhead DPS</b>						
None						

## Puget Sound Chinook Salmon ESU

**Hatchery Program:** Bernie Kai-Kai Gobin (Tulalip) Hatchery Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Change in SSHAG category

**Program Purpose:** Tribal ceremonial and subsistence fisheries in Tulalip Bay

**Broodstock Origin:** Marblemount Hatchery spring Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** Fish for this program are transferred from the Marblemount spring Chinook hatchery program annually for release into Tulalip Bay. Thus, no fish are collected for broodstock.

**SSHAG Category and Rationale:** Change from 3b/c to 2c to match the category assigned to Marblemount Hatchery spring Chinook salmon. Even though these fish are released outside of their native watershed, they are identical to spring Chinook salmon from Marblemount Hatchery. There is also no attempt to propagate a localized stock in Tulalip Bay.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Puget Sound Chinook Salmon ESU

**Hatchery Program:** North Fork Skokomish River Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** This is a new program, with the goal of creating a new population of spring Chinook salmon of within-ESU origin in a watershed where the historical native population was extirpated.

**Year Founded:** 2015 – Initial release of subyearlings into the North Fork Skokomish River.

**Program Purpose:** The program is designed to reintroduce a spring Chinook salmon population into the Skokomish River watershed.

**Broodstock Origin:** Broodstock used for the reintroduction program originate from adult spring Chinook salmon returns to WDFW's Marblemount Hatchery on the Cascade River, in the Skagit River watershed. Marblemount Hatchery spring Chinook salmon are included as part of the Cascade Chinook population, and are part of the listed Puget Sound Chinook salmon ESU. Stock transfers from Marblemount Hatchery to the Skokomish River watershed will be terminated when adult returns to the Skokomish River become localized, and annual returning abundance levels are sufficient to meet program broodstock collection goals.

**Percent Natural-origin Fish in Broodstock and Rationale:** No natural-origin Chinook salmon are purposely incorporated as broodstock at Marblemount Hatchery – the source for the Skokomish reintroduction program.

**Life History and Genetic Similarity to Local Populations at Release Location:** The life history of this reintroduced stock is likely similar to the extirpated Skokomish spring Chinook salmon. However, the source stock (North Puget Sound-adapted) is genetically dissimilar from the extirpated Skokomish spring Chinook salmon stock that was adapted to the conditions within the Skokomish River (Hood Canal).

**SSHAG Category and Rationale:** Category 2b because fish are used from the Marblemount spring Chinook salmon program with a SSHAG category of 2c. However, because there is no local natural population in the Skokomish River, the designation becomes 2b versus 2c.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Puget Sound Chinook Salmon ESU

**Hatchery Program(s):** Grovers Creek Hatchery and Satellite Rearing Ponds, Garrison Springs/Chambers Creek Hatcheries, Minter Creek Hatchery, Tumwater Falls/Percival Cove, and Hoodspout (Finch Creek) Hatchery Fall Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Justification for the exception of a category 2 program remaining out of the ESU listing.

**Program Purpose:** Harvest augmentation

**SSHAG Category and Rationale:** All of these programs were assigned a 2b category designation (NMFS 2003). The rationale is quoted here from NMFS (2004), “These populations were founded through transfers of Green River hatchery lineage fall chinook salmon into watersheds where no native chinook population existed, and where habitat features needed to sustain a natural chinook population are lacking. The populations are sustained by juvenile hatchery releases, lead to the production of no to few natural-origin adults, and remain geographically, ecologically, and genetically disconnected from the extant Green River hatchery population(s) originally used to found them. No measures have ever been applied in the hatchery programs to maintain the ecological and genetic characteristics of the Green River natural, hatchery, or hatchery-lineage populations.”

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Puget Sound Steelhead DPS

**Hatchery Program:** Fish Restoration Facility Steelhead

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** Proposed, Not yet begun

**Program Purpose:** This integrated harvest program will provide harvest opportunities to help mitigate for lost production related to the construction and operation of Howard Hanson and Tacoma Water dams and may assist in restoring steelhead to the upper Green River watershed.

**Broodstock Origin:** Natural-origin winter-run Green River steelhead

**Percent Natural-origin Fish in Broodstock and Rationale:** 100percent of the broodstock will be natural-origin fish.

**Life History and Genetic Similarity to Local Populations at Release Location:** All broodstock are proposed to be collected from natural-origin Green River winter-run steelhead representing the extant, Duwamish/Green River native population delineated by the Puget Sound Steelhead Technical Recovery team (Myers et al. 2015). There may be some life history differences as hatchery-origin steelhead are reared for one year and then released as yearlings. In contrast, natural-origin steelhead typically rear for at least two years before emigration.

**SSHAG Category and Rationale:** 1a. The hatchery stock source is within ESU and comes from the local natural population within the Duwamish/Green River. Because the program is new, there is unlikely to be any divergence from the local natural population attributable to program operations.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS



## Lower Columbia River Chinook Salmon ESU

**Hatchery Program(s):** Big Creek, Astoria High School (STEP), Warrenton High School (STEP), Klaskanine Hatchery Tule Fall Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** The Klaskanine hatchery tule fall Chinook salmon program releases Chinook salmon originating from Big Creek Hatchery to support fisheries in Youngs Bay. Because all four of the above programs release the same stock, the SSHAG category will be changed for the Klaskanine program to match those of the other three programs.

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Big Creek fall Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is an isolated program for harvest.

**Life History and Genetic Similarity to Local Populations at Release Location:** Because no natural-origin fish at Big Creek are used for broodstock, the stock is considered to have diverged from the Big Creek Chinook salmon population.

**SSHAG Category and Rationale:** The Klaskanine hatchery program SSHAG category is changed from a 2b to a 3b to match the other three propagation programs. Although category 3 populations are defined as not listed, these programs are one exception because although substantially diverged from natural populations within the ESU where they are released, they still represent a genetic resource for the ESU as a whole.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Chinook Salmon ESU

**Hatchery Program(s):** Deep River Net Pens Tule Fall Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Change in SSHAG category and add to listing

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Washougal (Hatchery) tule fall Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; these fish are returning hatchery-origin adults from the integrated Washougal River program that is considered part of the ESU.

**SSHAG Category and Rationale:** Change from 1 to 2c. Because these fish are identical to the Washougal Hatchery Chinook salmon, they are assigned the same numerical SSHAG category. The release of these fish outside of the program watershed into the Deep and Grays Rivers where a natural-origin Lower Gorge population exists leads to a 2c designation.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Chinook Salmon ESU

**Hatchery Program(s):** Bonneville Hatchery Tule Fall Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Change in SSHAG category

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Big White Salmon/Spring Creek NFH Tule fall Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; these are the same fish found at the Big White Salmon/Spring Creek NFH. These fish are surplus to the Spring Creek NFH program that is considered part of the ESU.

**SSHAG Category and Rationale:** Change from 2 to 2c. Because these fish are identical to the Spring Creek NFH Chinook salmon, they are assigned the same numerical SSHAG category. The release of these fish outside of the program watershed into the Lower Columbia River Gorge where a natural-origin Lower Gorge population exists leads to a 2c designation.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Chinook Salmon ESU

**Hatchery Program:** Kalama River Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** SSHAG category change

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Kalama River spring Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is an isolated program designated for harvest.

**Life History and Genetic Similarity to Local Populations:** Fish from this program have an identical genetic lineage to the local natural population.

**SSHAG Category and Rationale:** Change to 2a/b from 2b. Hatchery programs for spring Chinook salmon were established at Kalama Falls Hatchery in 1959 from fish returning to the Kalama Falls Hatchery trap. Historically and intermittently, fish from Lewis or Cowlitz spring Chinook salmon programs backfilled shortfalls. Currently, backfills of fish originating from Lewis spring Chinook programs are differentially marked so returning adults are not incorporated into the Kalama spring Chinook salmon program as broodstock. Genetic analysis in the 1980s indicated Kalama River spring Chinook salmon were genetically similar to, but distinct from, Cowlitz Salmon Hatchery and Lewis River wild spring Chinook salmon. Therefore, the founding source for this stock likely included local natural-origin fish, and the SSHAG category should reflect this.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Chinook Salmon ESU

**Hatchery Program:** Cathlamet Channel Net Pens Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** 2013

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Cowlitz River spring Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is the same as Cowlitz hatchery-only spring Chinook salmon program. These fish are surplus from the listed Cowlitz spring Chinook salmon program.

**SSHAG Category and Rationale:** 2b. This program uses spring Chinook salmon from the Cowlitz River and annually releases them at yearling size in the Cathlamet Channel via net pen acclimation where no native local population exists. Therefore, the numerical SSHAG category designation matches the designation for the Cowlitz River spring Chinook salmon and the lack of a native population leads to a 2b.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Coho Salmon ESU

**Hatchery Program:** Grays River and Peterson Coho Salmon

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** The Grays River hatchery program began rearing Type-N and Type-S coho in the 1960's from the Elochoman Hatchery. Following the closure of the Elochoman hatchery program, in 2009 the Grays River program began using natural-origin and hatchery-origin returns to the Grays River for their broodstock.

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Grays River Type-N coho stock complex

**Percent Natural-origin Fish in Broodstock and Rationale:** The program incorporates a minimum of 10 percent natural-origin fish.

**Life History and Genetic Similarity to Local Populations:** Releases of Elochoman River fish may have influenced coho in the Grays River, but both stocks are part of the same ESU. Thus, it is likely that the hatchery and natural-origin fish in the Grays River are similar.

**SSHAG Category and Rationale:** Change from 2c to 2a. NMFS (2003) designated the Grays River program as a 2c because of the use of fish from the Elochoman River. The current use of Grays River fish warrants a category change to 2a, because natural-origin broodstock are now sourced from the local, natural-origin population in the Grays River.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

## Lower Columbia River Coho Salmon ESU

**Hatchery Program(s):** Clatsop County Fisheries Net Pen Coho Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Change in SSHAG category

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Tanner Creek coho salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is the same as the Bonneville/Cascade/Oxbow Complex. These fish are surplus to the Bonneville/Cascade/Oxbow Complex program, which is part of the ESU.

**SSHAG Category and Rationale:** Change from 4 to 2c. Because these fish are identical to the Bonneville/Cascade/Oxbow Complex coho salmon, they are assigned the same numerical SSHAG category. The release of these fish outside of the program watershed into Youngs Bay where a natural-origin population exists leads to a 2c designation.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Coho Salmon ESU

**Hatchery Program(s):** Clatsop County Fisheries/Klaskanine Hatchery Coho Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Assign a SSHAG category

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Big Creek Hatchery

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is the same as the Big Creek Hatchery. These fish are surplus to the Big Creek Hatchery coho salmon program, which is considered part of the ESU.

**SSHAG Category and Rationale:** Designated category 2c. Because these fish are identical to the Big Creek Hatchery coho salmon, they are assigned the same numerical SSHAG category. The release of these fish outside of the program watershed into Klaskanine River where a natural-origin population exists leads to a 2c designation.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS



## Columbia River Chum Salmon ESU

**Hatchery Program(s):** Big Creek Hatchery Chum Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** Broodstock for this program was first collected in 2012 in the Grays River, WA, at the same time that broodstock for the Grays River Hatchery chum salmon program was collected.

**Program Purpose:** The purpose of the program is to reintroduce chum salmon into Lower Columbia River Oregon tributaries and develop a localized self-sustaining hatchery program at Big Creek Hatchery, such that return hatchery-origin chum salmon that are surplus to the needs of the hatchery program can be released into other Lower Columbia River tributaries in Oregon to spawn naturally.

**Broodstock Origin:** Big Creek/Grays River. Original broodstock from natural- and hatchery-origin adults collected in the Grays River. In 2014, broodstock was collected from adults returning to Big Creek Hatchery

**Percent Natural-origin Fish in Broodstock and Rationale:** None; all natural-origin adults returning to the hatchery are released above the hatchery to spawn naturally in Big Creek.

**Life History and Genetic Similarity to Local Populations at Release Site:** Chum salmon were essentially extirpated from Lower Columbia River tributaries. The Big Creek Hatchery chum salmon are similar to the Grays River chum salmon, which are part of the Lower Columbia River ESU

**SSHAG Category and Rationale:** Designated category 2a because the Big Creek Hatchery chum salmon program was recently derived from the local native Grays River population included in the ESU.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Steelhead DPS

**Hatchery Program:** Any program in the Lower Columbia River that uses Skamania summer steelhead

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** SSHAG Category clarification

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Skamania summer steelhead

**Percent Natural-origin Fish in Broodstock and Rationale:** None; this is an isolated program to support terminal harvest.

**Life History and Genetic Similarity to Local Populations at Release Site:** Summer steelhead genetic identity is extremely divergent from any native local population. There may be some life history differences as hatchery-origin steelhead are reared for one year and then released as yearlings. In contrast, natural-origin steelhead typically rear for at least two years before emigration.

**SSHAG Category and Rationale:** SSHAG (NMFS 2003) designates Skamania summer steelhead in the Washougal River as category 4 on page 9. This is correct, but we want to clarify that this category designation applies to all Skamania summer steelhead programs in the Lower Columbia River.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Lower Columbia River Steelhead DPS

**Hatchery Program(s):** Upper Cowlitz and Tilton River Wild Steelhead

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** 2012

**Program Purpose:** Harvest augmentation and supplementation of naturally-producing populations of late-winter steelhead

**Broodstock Origin:** Natural-origin fish from either the Upper Cowlitz or Tilton Rivers for the Upper Cowlitz and Tilton River programs, respectively.

**Percent Natural-origin Fish in Broodstock and Rationale:** 100 percent. The program is backfilled with hatchery-origin fish as needed.

**Life History and Genetic Similarity to Local Populations:** There may be some life history differences as hatchery-origin steelhead are reared for one year and then released as yearlings. In contrast, natural-origin steelhead typically rear for at least two years before emigration. Fish for these programs are genetically similar to the local populations in the Upper Cowlitz or Tilton Rivers for the Upper Cowlitz and Tilton River programs, respectively.

**SSHAG Category and Rationale:** 1a. These programs were recently founded and use only a local, natural-origin population for broodstock that are differentially marked to ensure continued separation of broodstock.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Lookingglass Hatchery Reintroduction Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Assign a SSHAG category

**Year Founded:** 2001

**Program Purpose:** Reintroduction

**Broodstock Origin:** Catherine Creek origin

**Percent Natural-origin Fish in Broodstock and Rationale:** Incorporation by sliding scale sensitive to natural-origin abundance.

**Life History and Genetic Similarity to Local Populations:** Stock was selected because it was within the same major population group of the ESU, and both Catherine Creek and Lookingglass Creek are in the Grande Ronde Basin.

**SSHAG Category and Rationale:** 1b because the program was founded using fish from Catherine Creek, which had a SSHAG category of 1a (NMFS 2003). Catherine Creek source was used because there are no natural-origin fish from Lookingglass Creek available to found the stock. Once the stock becomes localized and the program is self-sustaining, the program will support an integrated population in Lookingglass Creek.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** McCall Hatchery Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** Update SSHAG category based on transitioning from segregated to a stepping stone program with a sliding scale. A stepping stone program uses an integrated program to produce broodstock for a segregated harvest program. The purpose of using a stepping stone program is to maintain genetic continuity between the hatchery and natural-origin populations (HSRG 2014).

**Year Founded:** 1974

**Program Purpose:** Harvest augmentation and supplementation

**Broodstock Origin:** Snake Basin composite

**Percent Natural-origin Fish in Broodstock and Rationale:** The integrated component uses a sliding scale to incorporate natural-origin brood. Based on recent returns, the integrated program will typically include 50 to 70 percent natural-origin adults in the broodstock. Returns from the integrated portion of the program are used in the segregated harvest program broodstock.

**Life History and Genetic Similarity to Local Populations at Release Site:** Since founding, the program has collected broodstock from fish returning to the South Fork Salmon River, which has allowed the stock to localize. Thus, fish from this program are representative of natural-origin returns to the Salmon River Basin.

**SSHAG Category and Rationale:** Change from 1a/2a to 1a. This program was segregated at the time of the last review, but is transitioning to a program with an integrated component. Because the integrated component uses natural-origin fish and supplies broodstock for the segregated component, fish from both components are representative of the natural-origin population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Pahsimeroi Hatchery Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** Update SSHAG category based on transitioning from segregated to a stepping stone program with sliding scale. A stepping stone program is a program that uses an integrated program to produce broodstock for a segregated harvest program. The purpose of using a stepping stone program is to maintain genetic continuity between the hatchery and natural-origin populations (HSRG 2014).

**Program Purpose:** Supplementation and harvest augmentation.

**Broodstock Origin:** Pahsimeroi River

**Percent Natural-origin Fish in Broodstock and Rationale:** The integrated component uses a sliding scale to incorporate natural-origin broodstock. Based on recent returns, the integrated program will typically include 30 to 50 percent natural-origin adults in the broodstock. Returns from the integrated portion of the program are used in the segregated harvest program broodstock.

**Life History and Genetic Similarity to Local Populations:** Pahsimeroi stock has varied between segregated and integrated since its inception in 1968 but has always been collected at the Pahsimeroi weir.

**SSHAG Category and Rationale:** Change from 1a/2a to 1a. Had been segregated at time of last review, but is transitioning to a program with an integrated component. Because the integrated component uses natural-origin fish and supplies broodstock for the segregated component, fish from both components are representative of the natural-origin population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Yankee Fork SBT Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Include in ESU and SSHAG category change

**Program Purpose:** Reintroduction

**Broodstock Origin:** Sawtooth/Pahsimeroi

**Percent Natural-origin Fish in Broodstock and Rationale:** None. Once enough natural-origin adults return to the basin, a sliding scale will be developed to incorporate adults naturally returning to Yankee Fork into the broodstock.

**Life History and Genetic Similarity to Local Populations:** Stock was selected because it was within the same major population group and within the Upper Salmon Basin.

**SSHAG Category and Rationale:** Change from 2 to 1b. Fish used to found this program were from the Sawtooth/Pahsimeroi programs, which both have a SSHAG category designation of 1a, but there is no local natural population in Yankee Fork. Once the stock becomes localized and the program is self-sustaining, the program will support an integrated population in Yankee Fork.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Dollar Creek SBT Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Include in ESU and SSHAG category change

**Program Purpose:** Supplementation, future harvest potential

**Broodstock Origin:** SF Salmon River

**Percent Natural-origin Fish in Broodstock and Rationale:** None. This program obtains eggs annually from the listed McCall hatchery segregated harvest program.

**Life History and Genetic Similarity to Local Populations:** The McCall stock was selected because it was within the same major population group, and from within the South Fork Salmon Basin.

**SSHAG Category and Rationale:** Change from 2 to 1a. The numerical SSHAG category designation matches the designation for the listed McCall hatchery program. Because Dollar Creek is within the area occupied by the South Fork Salmon River spring/summer Chinook salmon population and this is the native population the supplied eggs are derived from, this program is designated a category 1a.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS



## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Panther Creek Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** Proposed, not yet begun

**Program Purpose:** Reintroduce a population in Panther Creek

**Broodstock Origin:** Pahsimeroi

**Percent Natural-origin Fish in Broodstock and Rationale:** None; only hatchery-origin fish are used from the Pahsimeroi program because there is no natural population in Panther Creek.

**Life History and Genetic Similarity to Local Populations:** Stock was selected because it was within the same major population group, and from within the Grande Ronde Basin.

**SSHAG Category and Rationale:** 1b because fish are used from the Pahsimeroi program with a SSHAG category of 1a and there is no local natural population in Panther Creek (ICTRT 2007). Once the stock becomes localized and the program is self-sustaining, the program will support an integrated population in Panther Creek.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Spring/Summer Chinook Salmon ESU

**Hatchery Program:** Program that propagates Dworshak stock/Clearwater River Chinook salmon:

- Dworshak National Fish Hatchery Spring/Summer Chinook Salmon
- Kooskia Spring/Summer Chinook Salmon
- Clearwater Hatchery Spring/Summer Chinook Salmon
- Nez Perce Tribal Hatchery Spring/Summer Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** SSHAG category change

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Dworshak stock/Clearwater River

**Percent Natural-origin Fish in Broodstock and Rationale:** None; the intent of the program is isolated harvest.

**SSHAG Category and Rationale:** From 3b to 4. The stock propagated for these programs is from outside the ESU.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Basin Steelhead DPS

**Hatchery Program:** South Fork Clearwater B-run Steelhead (localized)

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Program clarification. Steps have been taken to try and localize this stock to the South Fork Clearwater River by using only hatchery-origin fish returning to the South Fork Clearwater River

**Program Purpose:** Harvest augmentation/supplementation; localize a stock to the SF Clearwater River

**Broodstock Origin:** Dworshak stock/NF Clearwater River, now being localized to the SF Clearwater.

**Percent Natural-origin Fish in Broodstock and Rationale:** None; the program is segregated and is intended to increase harvest opportunity.

**Life History and Genetic Similarity to Local Populations:** A local population already exists, but likely has a similar life history and genetics to the Dworshak B-run because of historical and ongoing use of the Dworshak stock in the SF Clearwater.

**SSHAG Category and Rationale:** 2c. These are within the same major population group, but a different population than fish spawning naturally in the South Fork Clearwater.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Snake River Basin Steelhead DPS

**Hatchery Program:** Programs that use Dworshak NFH/Clearwater River B-run steelhead and release then into the Salmon River Basin:

- EF Salmon B-run Steelhead
- Squaw Creek B-run Steelhead
- Little Salmon River B-run Steelhead

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** Program clarification. The Dworshak stock/NF Clearwater River stock is a listed stock reared at both Dworshak and Clearwater Hatcheries. The stock is used for release into Lolo Creek, NF Clearwater River, EF Salmon River, Squaw Creek and Little Salmon River. All programs use the same broodstock and are intermingled during various stages of production prior to release. As a result, even the Salmon River Basin programs will reflect the listing status of the broodstock source (and not release location).

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Dworshak stock/NF Clearwater River

**Percent Natural-origin Fish in Broodstock and Rationale:** None; the purpose of the program is harvest.

**Life History and Genetic Similarity to Local Populations:** This stock originates from returns to Dworshak dam. Regardless of release location, these fish represent the legacy genetics of fish that were eliminated when Dworshak Dam blocked passage to the NF Clearwater River.

**SSHAG Category and Rationale:** 2c. NMFS (2003) designated the Dworshak B-run steelhead released into the Salmon River Basin (East Fork Salmon, Squaw Creek, and Little Salmon River) as category 3c, and thus excluded these programs from the listing based on release location. However, the broodstock are the same as those released in the Clearwater Basin. Because all Dworshak origin B-run steelhead are derived from the same source, the listing status should remain consistent regardless of release location.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Upper Columbia River Spring Chinook Salmon ESU

**Hatchery Program:** Winthrop NFH Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** The Winthrop NFH is located on the Methow River. It produces spring Chinook salmon for harvest augmentation. There is also a hatchery programs on the Methow River that produces spring Chinook salmon for conservation (i.e., Methow-Composite). When the Winthrop NFH spring Chinook salmon hatchery program was first evaluated by the SSHAG (NMFS 2003), it reared Carson stock. Since then, it has switched to a local Methow-Composite stock. The current hatchery program only incorporates hatchery-origin adults returning from the Methow Conservation program. Therefore, divergence from the local population is minimized.

**Program Purpose:** Harvest augmentation, and safety-net for Methow River program. Program also provides fish for the Okanogan 10(j) spring Chinook salmon reintroduction.

**Broodstock Origin:** Methow-Composite stock

**Percent Natural-origin Fish in Broodstock and Rationale:** None. This is a harvest augmentation program, which also serves as a safety net program for the Methow Conservation program. Since the Winthrop NFH program has no conservation purpose per se, the exclusive use of hatchery-origin broodstock is appropriate. However, the broodstock consists entirely of returnees from the Methow Conservation program, so divergence is minimized.

**Life History and Genetic Similarity to Local Populations:** Broodstock, except for an additional generation of hatchery rearing, is genetically identical to the Methow-Composite stock used by the Methow Conservation program, which, except for a generation of hatchery rearing, is genetically identical to the natural Methow spring Chinook population.

**SSHAG Category and Rationale:** Change from 3c/4 to 2a because the broodstock now consists entirely of Methow-Composite spring Chinook. Since it differs from the Methow Conservation program broodstock by only one generation of hatchery rearing, it merits the same SSHAG designation as the Methow Conservation program.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

## Upper Columbia Spring Chinook Salmon ESU

**Hatchery Program:** Nason Creek Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Year Founded:** First brood collection in 2013

**Program Purpose:** Conservation, mitigation funded by Grant PUD through the Priest Rapids Settlement Agreement.

**Broodstock Origin:** Wenatchee River spring Chinook salmon

**Percent Natural-origin Fish in Broodstock and Rationale:** Percent natural-origin broodstock (pNOB) level needed to achieve a proportionate natural influence (PNI) of 67 percent on an abundance-based sliding scale and subject to a limitation of no more than 33 percent of the natural-origin fish taken for broodstock. To obtain these goals, natural-origin fish from the Wenatchee River run at large will be included in broodstock along with returnees from the Nason Creek program.

**Life History and Genetic Similarity to Local Populations:** Nason Creek spring Chinook salmon are part of the Wenatchee River spring Chinook salmon population and therefore are genetically similar.

**SSHAG Category and Rationale:** Categorized as 1a because the source of the broodstock is the local Wenatchee River population and the hatchery program is minimally diverged from the Wenatchee River spring Chinook population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Upper Columbia River Steelhead DPS

**Hatchery Program:** Okanogan River Steelhead (formerly known as Omak Creek)

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Program Purpose:** Conservation

**Broodstock Origin:** Mix of Wells and natural-origin Okanogan returnees

**Percent Natural-origin Fish in Broodstock and Rationale:** Usually low percent natural-origin broodstock (pNOB), but program intends to transition in next 10 years to 100 percent natural-origin broodstock collected in Omak Creek and other streams.

**Life History and Genetic Similarity to Local Populations:** Okanogan River steelhead, like Methow and Wenatchee steelhead, have been heavily influenced by in-Basin releases of Wells steelhead, a non-local but within-DPS stock. This program parallels efforts in the two other Basins to replace the infusion of non-native fish with hatchery returns from natural-origin broodstock collected from within the Basin.

**SSHAG Category and Rationale:** Currently 2b because the Okanogan population was extirpated, but transitioning to 2a as the Okanogan population becomes localized. The program will then transition to 1a within 2 or 3 generations as the program moves to incorporate 100 percent natural-origin broodstock from the natural population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## Oregon Coast Coho Salmon ESU

**Hatchery Program:** North Fork Nehalem Coho Salmon

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** This hatchery stock has been changed to Category 3c due to continued divergence between the hatchery stock and the local, natural-origin population. See NMFS (2003) for program details.

**Program Purpose:** Isolated harvest

**SSHAG Category and Rationale:** Change from 2c to 3c. This program was founded originally from two different broodstock (non-local and local). Since founding, broodstock for this program has been entirely from marked coho salmon returning to the hatchery facility. No natural-origin coho salmon have been intentionally incorporated into the broodstock over the last nine generations. In addition, hatchery fish on the spawning grounds in the Nehalem Basin has been less than 10 percent of the spawners since 1998 (NMFS 2004). Thus, the hatchery fish are likely becoming more divergent from the natural population in the North Fork Nehalem. The current hatchery stock would not be well suited for conservation or supplementation objectives, if needed in the future because of the hatchery stock's divergence from the local population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS



## Central Valley Spring Chinook Salmon ESU

**Hatchery Program:** Feather River Fish Hatchery (FRFH) Spring Chinook Salmon

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** Rigorous selection procedures will allow the FRFH to better separate spring and fall Chinook broodstock, further improving the genetic distinction between the two races. Since 2004, spring-run Chinook salmon identified as phenotypic spring Chinook salmon are trapped and tagged at the FRFH between May 1 and June 30. All tagged spring Chinook are immediately released back into the Feather River in the vicinity of the FRFH. The ladder will be re-opened on or near September 15 of each year to allow fish enter to the hatchery for sorting and artificial spawning. Genetic analysis will be conducted annually to better inform future broodstock selection with regard to both origin (hatchery vs. natural) and relatedness. Egg culling procedures will further the separation of spring and fall broodstock by eliminating the “tails” of each run at the hatchery. Finally, genetic samples will be taken from tagged phenotypic spring Chinook salmon and will be tested for evidence of introgression from other runs.

**Program Purpose:** The primary purpose of the program is the conservation of phenotypic and genotypic characteristics of Feather River spring Chinook salmon while minimizing impacts to other listed fishes. A secondary purpose of the program is to mitigate for spawning and rearing habitat eliminated due to construction of Oroville Dam in the early 1960s.

**Broodstock Origin:** Feather River stock

**Percent Natural-origin Fish in Broodstock and Rationale:** The composition of natural-origin fish in the FRFH spring broodstock is unknown. Beginning in 2002, FRFH has attempted to adipose fin clip and CWT all spring Chinook salmon smolts produced and released. However, since a large portion (75 percent) of hatchery fall Chinook salmon are not marked and an unknown number of the unmarked fish trapped in the spring may be early arriving fall fish, the percentage of natural-origin spring Chinook salmon remains unknown.

**Life History and Genetic Similarity to Local Populations:** Feather River spring-run Chinook salmon have been described as being genetically most similar to Central Valley fall (Banks et al. 2000). More recently, O'Malley et al. (2007) reported significant evidence for two genetically distinct migratory runs in the Feather River using the circadian rhythm gene, and also reported the fall and threatened spring runs were genetically homogenous based on neutral microsatellite data.

**SSHAG Category and Rationale:** 2a

*Source from local, native natural population* - The spring Chinook salmon broodstock originated from Feather River stock and is presumed to be representative of remaining Feather River spring Chinook salmon populations.

*Moderate - few natural-origin fish in broodstock* - The percentage of natural-origin spring Chinook salmon used as broodstock remains unknown. However, recent data collected at FRFH suggests the majority of FRFH broodstock (>75percent) are of hatchery origin.

*No more than moderate divergence* - An important question for Feather River populations involves the genetic integrity of the present spring Chinook salmon. Unfortunately, pre-Oroville Dam genetic information is not available for comparison. Since 1995, studies have been conducted that include samples from Feather River spring and fall Chinook salmon sources including fish captured in river by anglers and early arriving fish from FRFH (Banks et al. 2000; Hedgecock et al. 2001; O'Malley et al. 2007). Based on these studies hybridization between Feather River spring and fall Chinook salmon has clearly occurred.

Spring Chinook salmon are propagated at FRFH and a segment of this run spawns naturally in the Feather River. However, Feather River spring Chinook salmon more closely resemble fall Chinook salmon, and to date cannot be separated from fall by genetic techniques. The co-occurrence of spring and fall Chinook salmon on the remaining spawning grounds below Oroville Dam, along with poor run segregation practices at FRFH, has led to considerable intermixing and confusion between Feather River fall and spring. Despite the introgression that has occurred, there is little divergence from the local, natural population(s) in the watershed.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

## Northern California Steelhead DPS

**Hatchery Program:** Mad River Hatchery

**Reason for Write-Up:**

- Program Change
- New Program
- Other

**Summary of Program Change/Other:** In 2014, started incorporating at least 50 percent natural-origin broodstock.

**Program Purpose:** Harvest augmentation

**Broodstock Origin:** Eel River fish initially; now localized to Mad River

**Percent Natural-origin Fish in Broodstock and Rationale:** At least 50 percent natural-origin fish should be incorporated into the broodstock to foster convergence of hatchery and natural-origin fish over time.

**Life History and Genetic Similarity to Local Populations:** Allozyme data group Mad River samples in with the Mad River Hatchery and then with the Eel River (Busby et al. 1996). There have been no introductions since 1974. However, it remains likely that the stock is extremely diverged from most native, natural populations in the watershed (NMFS 2003). Recent work suggests that the contemporary hatchery population is indeed extremely diverged from the natural-origin fish in the Mad River (Reneski 2011).

**SSHAG Category and Rationale:** NMFS (2003) designated this program a category 4. At this time, we do not suggest a change in SSHAG category designation because of the divergence between the hatchery stock and the natural population, although this should be re-evaluated in the future, given the change in broodstock practices.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS
- Remain out of ESU/DPS
- Include in ESU/DPS
- Remove from ESU/DPS

## California Central Valley Steelhead DPS

**Hatchery Program:** Mokelumne River Hatchery

**Reason for Write-Up:**

- Program Change**
- New Program**
- Other**

**Summary of Program Change/Other:** Egg transfers that occurred in the past using an out-of-basin stock were discontinued many years ago and, following program failure, were followed by egg transfers from the Feather River Hatchery steelhead program, which is part of the listed DPS. Recent genetic work (Garza and Pearse, unpublished data) now shows that steelhead from the Mokelumne River Hatchery are descended from steelhead that are currently part of the DPS.

**Program Purpose:** Mitigation for Comanche Dam

**Broodstock Origin:** Feather River

**Percent Natural-origin Fish in Broodstock and Rationale:** Since 1999, all juvenile steelhead released have been adipose fin marked. Since the 2002-2003 trapping season, natural-origin steelhead used as broodstock was estimated to be as high as 65percent. Recently, returning adults are almost completely comprised of hatchery-origin steelhead, with natural-origin steelhead incorporated into the broodstock at a rate of 10percent or less.

**Life History and Genetic Similarity to Local Populations:** See above “summary of program change” for genetic information. There may be some life history differences as hatchery-origin steelhead are reared for one year and then released as yearlings. In contrast, natural-origin steelhead typically rear for at least two years before emigration.

**SSHAG Category and Rationale:** 2c

*Broodstock source is non-local but within the DPS* - Recent genetic analysis shows Mokelumne River steelhead most closely resemble Feather River Fish Hatchery steelhead which are part of the DPS.

*Native local natural population exists* - McEwan and Jackson (1996); McEwan (2001) report that the river once produced a significant number of natural steelhead, although there is debate about whether there was an indigenous steelhead stock prior to releases of out-of-Basin hatchery stocks (Cramer et al. 1995). Currently the steelhead population in the Mokelumne River likely consists of both resident and anadromous life histories, with the resident form likely dominating.

*Moderate to a few natural-origin fish in broodstock and no more than moderate divergence* - Typically less than 10 percent of the natural-origin fish are incorporated into the broodstock. There is little to no evidence that shows more than moderate divergence from the natural population.

**ESU/DPS Inclusion Recommendation:**

- Remain in ESU/DPS**
- Remain out of ESU/DPS**
- Include in ESU/DPS**
- Remove from ESU/DPS**

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