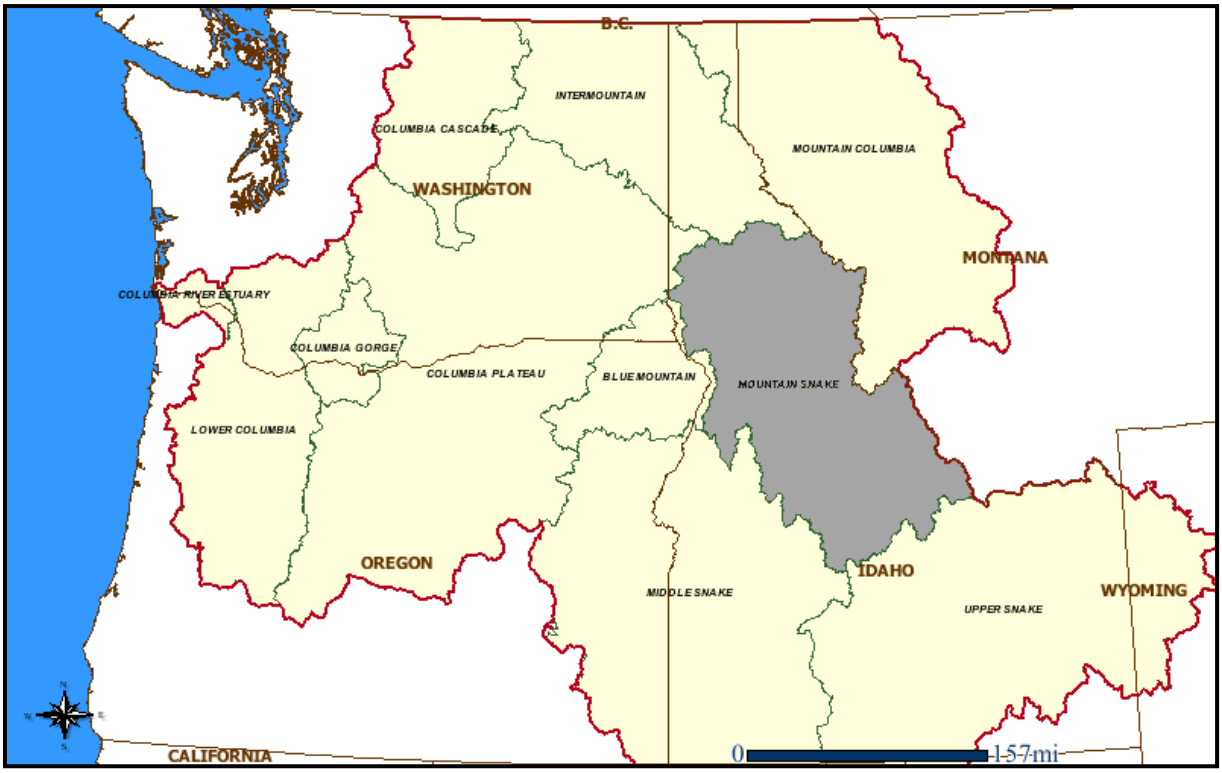
U.S. Fish and Wildlife Service - Pacific Region

Columbia River Basin Hatchery Review Team

Columbia River Basin, Mountain Snake Province

Clearwater and Salmon River Watersheds



Dworshak, Kooskia and Hagerman National Fish Hatcheries

Clearwater, Magic Valley, McCall, and Sawtooth Fish Hatcheries (Idaho Department of Fish & Game)

Assessments and Recommendations

Final Report, Appendix A:

All-H Analyzer (*AHA*) Output for Salmon and Steelhead Stocks

March 2011

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Appendix A: All-H Analyzer (*AHA*) Output for Spring/Summer Chinook Salmon and Summer Steelhead Stocks at Dworshak NFH, Kooskia NFH, Hagerman NFH (USFWS), and Clearwater FH, Magic Valley FH, McCall FH, and Sawtooth FH (IDFG), including natural populations in the Clearwater and Salmon rivers, Idaho.

What is AHA?

AHA is an *Excel*-based spreadsheet simulation model that quantifies the mean number of adult salmon or steelhead returning to a watershed after many generations (years) of reproduction and migration based on equilibrium, or near equilibrium, conditions. Recent versions of *AHA* (Versions 6.x and higher) for the Columbia River allocate returning adult fish to one of six locations: (1) a hatchery and other recapture facilities where adult fish are removed; (2) the natural habitat where adult fish spawn; (3) harvest in the marine environment; (4) harvest in the lower Columbia River mainstem downstream from Bonneville Dam; (5) harvest in the upper Columbia River mainstem upstream from Bonneville Dam, and (6) harvest in terminal areas in the general areas where they originated as smolts.

The *AHA* model was originally developed primarily by Lars Mobrand (Mobrand Biometrics, Vashon Island, WA), in collaboration with the Washington Department of Fish and Wildlife (WDFW) and the Northwest Indian Fisheries Commission (NWIFC), as part of the HSRG review[1] of salmon and steelhead hatcheries in Puget Sound and coastal Washington state. Updated versions that summarize results over all populations (Version 12.1 and higher) were developed by Greg Blair (Jones, Stokes, and Mobrand; Vashon Island, WA) in collaboration with Lars Mobrand.

AHA is based on the Beverton-Holt spawner-recruit model where habitat *capacity* is the asymptote of the Beverton-Holt curve (i.e., maximum number of adult recruits that the habitat can produce) and *productivity* is the slope of the curve at the origin (i.e., the maximum number of adult recruits per adult spawner [*R/S*] when density-dependent factors or competition can be ignored). The actual model (spreadsheet) consists of several component modules (e.g., natural component module, hatchery component module, genetic fitness module, etc.) where estimated mean values of biological and population dynamic parameters are provided by the user (e.g. mean fecundity of females, estimated egg-to-smolt survival, etc.). The genetic fitness function is based on the model of Ford (2002)[2] and allows the mean fitness of a population (productivity) to change incrementally over time depending on (a) the mean proportion of natural spawners composed of hatchery-origin adults (*pHOS*) relative to the mean proportion of the hatchery broodstock composed of natural-origin adults (*pNOB*), and (b) the number of generations that hatchery-origin fish spawn naturally in the watershed.

A useful index for assessing the genetic impact of a hatchery program on a natural population is the *Proportionate Natural Influence* = PNI = pNOB/(pNOB + pHOS), where PNI varies

[1] www.hatcheryreform.org

[2] *Ford, M.J. 2002. Selection in captivity during supportive breeding may reduce fitness in the wild. Conservation Biology 16: 815-825.*

from 0.0 (high hatchery influence, low natural environmental influence) to 1.0 (no hatchery influence). When *pHOS = pNOB,* the hatchery and natural environments will have approximately equal influence on the genetic constitutions of both hatchery and wild fish, and *PNI* = 0.5. For integrated hatchery populations and natural stocks, the goal is for *PNI* to be greater than 0.5 and as close to 1.0 as possible (e.g., > 0.67) as a long-term goal.

The AHA model is currently being used by fishery comanagers in the Pacific Northwest as a "planning tool" to (a) document assumptions and parameters for hatchery and natural populations and (b) compare the outcomes of alternative management strategies and scenarios. Only those scenarios achieving realistic or desired outcomes are considered valid. For example, any scenario that results in extirpation of a stock is considered invalid, where any or all of the four H's[3] can contribute to stock extirpation.

For more detail on AHA, see the "Tools" page of the Hatchery Scientific Review Group's (HSRG's) website: http://www.hatcheryreform.us. An AHA user's guide, the AHA model, and all AHA datasets for the Columbia River Basin are available for download. See also "HSRG White Paper No. 1" under the publications page for theoretical details regarding PNI and the relative effects of the hatchery and natural environments on mean population fitness.

Explanation of Tables A1-A56[4]

Information in the following *AHA* output tables (Tables A1-A56) is intended to provide a summary "snapshot" of the potential equilibrium outcomes associated with current hatchery programs and alternatives considered by the Hatchery Review Team. Five sets of simulations or scenarios are presented in each table: (a) current situation and hatchery programs; (b) the potential "no hatchery" condition; (c) the "hatchery solution" proposed by the HSRG; and (d) two alternative scenarios proposed by the HRT. AHA version 13.2.1 was used to generate the outputs in Tables A1-A56.

Output of *AHA* is displayed in a series of colored bar graphs representing the equilibrium, mean numbers of adult fish (recruits) allocated to each of the six aforementioned locations (hatchery, freshwater habitat, and four harvest locations). In those bar graphs, solid green represents natural-origin fish; solid pink represents hatchery-origin fish, pink diagonal hash bars represent hatchery-origin fish in excess of comanager goals, and pink vertical bars represent hatchery-origin fish that have been selected at least one generation in the natural environment (e.g. as occurs in a genetically-integrated hatchery program).

The graph in the lower-left portion of each table shows the realized mean values of *pNOB* and *pHOS* for each of the five scenarios (Current, No Hatchery, etc.). The diagonal lines represent combination values of *pNOB* and *pHOS* that yield the same value of *PNI.* Symbols on the *PNI* graph correspond with each of the scenarios shown as bar graphs (see also the *Components of*

[3] *Habitat, Harvest, Hydropower, and Hatcheries are commonly referred to as the "four H's".*

[4] *Parameter estimates used to generate the following tables have not all been verified and should be considered preliminary. However, their values are based on the best information available, and the general results presented in the following tables are not expected to change significantly as the parameter estimates are verified and updated.*

this Report section for definitions of biological significance, population viability, habitat, and harvest ratings).

The outputs presented in Tables A1-A56 are intended to be viewed electronically on a desktop computer where portions of the tables can be "zoomed in" for clarity. The Review Team acknowledges that those tables are difficult to read as printed paper copies.

AHA data files in V.13.2.1 are stored as "roll-up" files for all populations of each salmonid species in the Columbia River Basin. The specific parameterized versions of the "roll-up" files and *AHA* (V.13.2.1) used to generate the outputs in Tables A1-A56 are available upon request from the Chair of the Hatchery Review Team. Some familiarity with *AHA* is required, and expected, before implementing the software. The software and baseline data files for Tables A1-A56 can be downloaded from the HSRG website under the "Tools" tab at *www.hatcheryreform.us*.

Tables A1-A9: *AHA* outputs for the Clearwater River Major Population Group (MPG) of spring-summer Chinook salmon

Parameters and assumptions for spring/summer Chinook in the Clearwater River Major Population Group (MPG)

Productivity and survival parameters for hatchery origin spring Chinook within the Clearwater River basin (Table 1A) were obtained from the HSRG, as provided by Idaho Department of Fish and Game (IDFG).

Table 1A. Mean values of reproductive and survival parameters assumed in the AHA analyses for hatchery-origin spring/summer Chinook released within the Clearwater River MPG.

Hatchery/ Release location ***Population/Stock***	**Female Fecundity (No. of eggs)**	**Within-hatchery survival (egg-to-smolt)**	**Post-release survival (%) (smolt-to-adult)**	**Recruit/spawner (R/S; adults)**
Dworshak NFH *Dworshak NFH Spring Chinook*	4,500	0.79	0.58%	7.0
Kooskia NFH *Kooskia NFH Spring Chinook*	4,500	0.79	0.58%	7.0
Clearwater FH/ Powell Satellite, Lochsa River *Lochsa River Spring Chinook*	4,200	0.90	0.44%	6.0
Clearwater FH, NPTH/ Lower Selway River, *Lochsa River Spring Chinook*	4,500	Smolts = 0.79 Parr = 0.85	Smolts = 0.26% Smolt+parr=0.14%	Smolts = 3.2 Parr = 0.7
Clearwater Hatchery/ Upper Selway River, *Lochsa River Spring Chinook*	4,500	Parr = 0.85	Parr = 0.07%	Parr = 0.9
Clearwater Hatchery/ Crooked and Red River Satellites *S.F. Clearwater R. Spring Chinook*	4,200	0.70	0.37%	4.0
Nez Perce Tribal Hatchery *NPTH Spring Chinook*	4,500	0.79	0.35%	4.2
Nez Perce Tribal Hatchery/ Newsome Creek *Newsome Creek Spring Chinook*	4,200	Smolts = 0.70 Pre-smolts = 0.79	Smolts = 0.37% Pre-smolts= 0.09%	Smolts = 4.0 Pre-smolts = 1.0
Nez Perce Tribal Hatchery/ Lolo Creek *Lolo Creek Spring Chinook*	4,500	Smolts = 0.70 Pre-smolts = 0.79	Smolts = 0.37% Pre-smolts= 0.08%	Smolts = 4.0 Pre-smolts = 1.0

Current programs, HSRG solutions, and HRT alternatives

The HRT modeled *Alternative 1* (current hatchery programs with implementation of all HRT recommendations) and the Team's preferred alternatives for each of the spring Chinook hatchery programs conducted within the Clearwater River basin. Each population release site consists of five scenarios: *Current* program, *No Hatchery* scenario, *HSRG Solution*, *HRT Alternative 1*, and the *HRT Preferred Alternative* (Table 2A). The HRT *Preferred Alternative* assumes that reestablishment of naturally spawning populations is the principal short-term goal of spring Chinook hatchery programs in the Lochsa, Selway, and upper South Fork Clearwater rivers.

Table 2A. Summary of the number of hatchery-origin (HOR) spring Chinook smolts, pre-smolts, and parr released in the Clearwater River under four strategies modeled in *AHA* Tables A1-A9: (1) *Current* programs are based on the LSRCP Cooperators 2008 Annual Operating Plan for the Clearwater River, (2) the *HSRG Solution*, (3) *HRT Alternative 1* (current programs with implementation of HRT recommendations), and (4) the *HRT Preferred Alternative* which emphasizes reestablishment of naturally spawning populations in the Lochsa, Selway, and upper S.F. Clearwater rivers and emphasizes harvest in the mainstem Clearwater River. The names of hatchery stocks/populations are in italics (e.g., "*Dworshak*", "*Kooskia*", etc.) and are identified by the facility/location where adults are trapped for broodstock. The Hatchery Review Team did not specifically review programs associated with the Nez Perce Tribal Hatchery (e.g., Lolo Creek, Newsome Creek), but the *AHA* outputs for those programs are presented here as part of the data set packages available from the HSRG (www.hatcheryreform.us).

Release location	Current	HSRG Solution	HRT Alternative 1	HRT Preferred Alternative
Dworshak NFH, N.F. Clearwater River *(AHA Table A1)*	• 1.05 M *Dworshak* smolts	No recommendation (same as Current)	Same as current	1.45M *Dworshak* smolts
Kooskia NFH, Clear Creek *(AHA Table A2)*	• 600K *Kooskia* smolts	No recommendation (same as Current)	• 500K *Kooskia* smolts	Terminate on-station rearing; • 600K *Kooskia* smolts reared at Clearwater Hatchery.
S.F. Clearwater River, Red and Crooked rivers *(AHA Table A3)*	• 1.1M *SF Clearwater* smolts	No recommendation (same as Current)	Same as Current	• 300K *Red/Crooked R.* smolts (*pNOB* = 0.67)
Newsome Creek *(AHA Table A4)*	• 30K *Newsome Cr.* pre-smolts • 45K *NPTH* pre-smolts	• 75K *Newsome Cr.* smolts (*pNOB* = 1.0)	No recommendation (Same as HSRG)	No recommendation (Same as HSRG)
Lolo Creek *(AHA Table A5)*	• 85K *Lolo Cr.* pre-smolts • 65K *NPTH* pre-smolts	• 100K *Lolo Cr.* smolts (*pNOB* = 1.0)	No recommendation (Same as HSRG)	No recommendation (Same as HSRG)
Nez Perce Tribal Hatchery (*NPTH*) *(AHA Table A6)*	• 125K *NPTH* smolts	No recommendation (same as Current)	No recommendation (same as Current)	No recommendation (same as Current)
Lochsa River at Powell Pond *(AHA Table A7)*	• 400K *Lochsa* smolts	• 700K *Lochsa* smolts	• 400K *Lochsa* smolts	• 300K *Lochsa* smolts (*pNOB* = 0.75)
Lower Selway River, including Meadow Cr. *(AHA Table A8)*	• 300K *Lochsa* smolts • 400K *Dworshak* parr (released into Meadow Creek)	No recommendation (same as Current)	• 300K *Lochsa* smolts	• 200K *Lochsa* smolts
Upper Selway River *(AHA Table A9)*	• 300K *Lochsa* parr	• 100K *Selway* smolts (*pNOB* = 1.0)	• 300K *Lochsa* parr	• 200K *Lochsa* parr

Table A1. *AHA* output for Dworshak NFH spring Chinook, North Fork Clearwater River

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Spring Chinook
6B-NF Clearwater_Spring Chinook (Dworshak-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Harvest	Reintroduction: Conservation	Reintroduction: Harvest	Reintroduction: Harvest	Reintroduction: Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	1		1	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.300	0.005		0.300	0.005		0.300	0.005		0.300	0.005		0.300
	Total Exploitation Rate		NORs		HORs	0.083		0.413	0.083		0.413	0.083		0.413	0.083		0.413	0.083		0.413
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release	700		1,051,143				700		1,051,143	700		1,051,143	966		1,450,576
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays	266	266					266	266							
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	7.0		y			y	7.0		y	7.0		y	7.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
	Update		Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
			Hatchery																	

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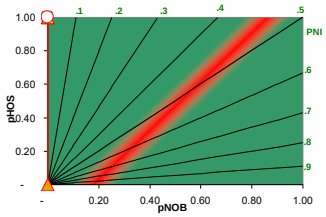
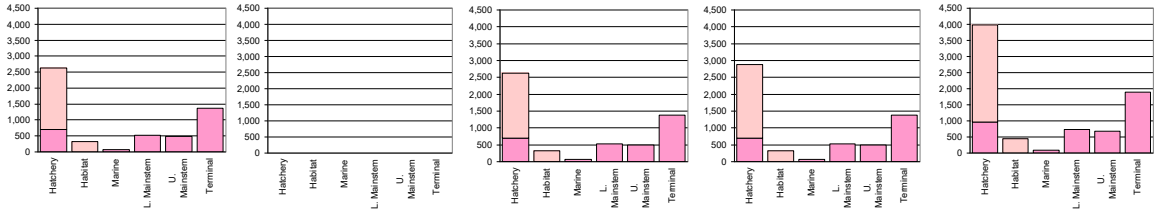
Realized Spawning Composition





	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->	80	80	80	80	80
Weir Factor ->					
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->	0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->	12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->					
"Fitness Floor" -> 0.5	Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.5%		0.5%	0.5%	0.5%
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	979	170	320				979	170	320	979	170	320	1,351	234	442

Table A2. *AHA* output for Kooskia NFH spring Chinook, Clear Creek, and Middle Fork Clearwater River

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Clearwater	Spring Chinook
6A-Clearwater_Middle Fork Clearwater Spring Chinook (Kooskia-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:	Reintrodution: Harvest	Reintrodution: Harvest	Reintroduction: Conservation	Reintrodution: Harvest	Reintrodution: Harvest	Reintrodution: Harvest
Harv&Hatchery Strategy:	Segregated hatchery	Segregated hatchery	Natural Reproduction Only	Segregated hatchery	Segregated hatchery	ar spring Chinook at Clearwater and Dworsh
Population Recovery Designation:	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	1		1	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.300	0.005		0.300	0.005		0.300	0.005		0.300	0.005		0.300
	Total Exploitation Rate		NORs		HORs	0.083		0.413	0.083		0.413	0.083		0.413	0.083		0.413	0.083		0.413
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release	400		600,652				400		600,652	334		501,545		400	600,652
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	7.0		y			y	7.0		y	7.0		y	7.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
			Hatchery																	

Update

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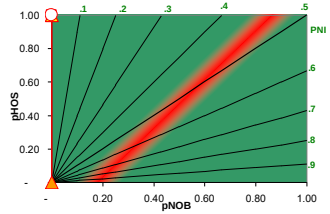
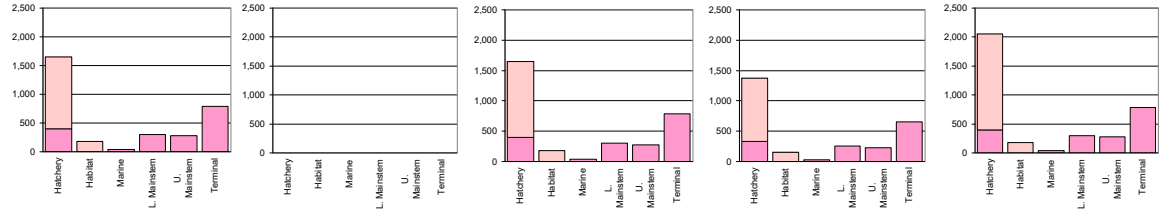
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->		0.5%		0.5%	0.5%	0.5%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement		0	0				0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	559	97	183							559	97	183	467	81	153	559	97	183

Table A3. *AHA* output for South Fork Clearwater River Spring Chinook, including Red and Crooked rivers (Clearwater Anadromous Fish Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Clearwater	Spring Chinook
4-Clearwater_South Fork Clearwater Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Conservation
Harv&Hatchery Strategy:		Integrated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Integrated Hatchery
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		231,905	161		231,905	161		231,905	161		231,905	161		231,905	161		231,905
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875	1.30		1,875
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.050
	Harv -Terminal		NORs		HORs	0.100		0.350	0.100		0.350	0.100		0.350	0.100		0.350	0.100		0.100
	Total Exploitation Rate		NORs		HORs	0.170		0.455	0.170		0.455	0.170		0.455	0.170		0.455	0.170		0.170
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal													67%		
			PNI		pHOS-Realized			49%						49%			49%	0.50		67%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Int	Cons		None	Both		Seg	Both		Seg	Cons		Int
	Broodstock by Source	Local / Imported	Smolt Release			832		1,100,736				832		1,100,736	832		1,100,736	229		300,861
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			13						22			16			27
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	10%		90%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	4.0		y			y	4.0		y	4.0		y	4.0		y
Patterns (Update)	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
			Hatchery																	

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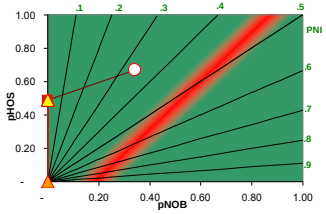
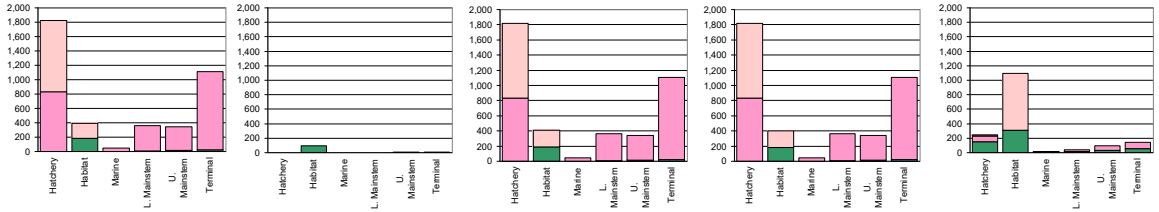
Realized Spawning Composition





Relative Hatchery Optimum ->				80				80				80				80				80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				80%				80%				80%				80%				80%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				0.50				1.00				0.50				0.50				0.62
Average Fitness Factor (100 Generations) ->				0.50				0.99				0.50				0.50				0.65
Generations until average fitness is reached ->				16				30				16				16				38
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.49			Effective pHOS ->				Effective pHOS ->	0.49			Effective pHOS ->	0.49			Effective pHOS ->	0.67
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->				pNOB ->				pNOB ->				pNOB ->	0.34
Calculated Hatchery SAR ->			0.3%						0.3%			0.3%			0.3%			0.3%		
Calculated Natural SAR ->			0.8%			0.8%			0.8%			0.8%			0.8%			0.8%		
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			640	57	180	301	13	93	661	59	186	647	58	182	1,571	-2	311			
HoS Total Escapement (includes strays)			657	114	215				685	119	224	666	116	218	2,413	419	786			

Table A4. *AHA* output for Newsome Creek Spring Chinook, S.F. Clearwater River (Nez Perce Tribal Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Clearwater	Spring Chinook
4-Clearwater_South Fork Clearwater_Newsome Creek Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation
Harv&Hatchery Strategy:		Integrated + supplementation	Natural Reproduction only	Integrated + supplementation	Integrated + supplementation	Integrated + supplementation
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		625	1.30		625	1.30		625	1.30		625	1.30		625	1.30		625
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		77,302	161		77,302	161		77,302	161		77,302	161		77,302	161		77,302
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		625	1.30		625	1.30		625	1.30		625	1.30		625	1.30		625
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050
	Harv -Terminal		NORs		HORs	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005
	Total Exploitation Rate		NORs		HORs	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal	10%						100%			100%			100%		
			PNI		pHOS-Realized	0.08		43%				0.64		57%	0.64		57%	0.64		57%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		Int	Cons		None	Cons		Int	Cons		Int	Cons		Int
	Broodstock by Source		Local	Imported	Smolt Release	22	35	75,411				57		75,279	57		75,279	57		75,279
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			11						20			14			29
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	50%		50%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	1.0		y			y	4.0		y	4.0		y	4.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

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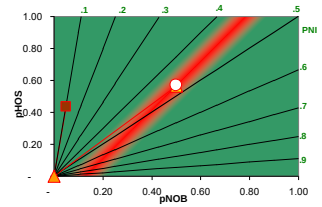
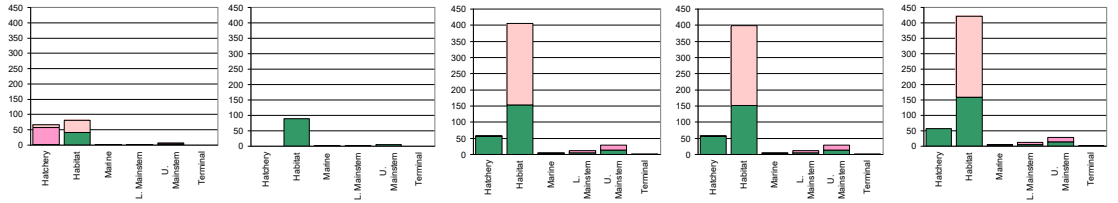
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.77	0.77	0.77
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.78	0.78	0.78
Generations until average fitness is reached ->		20	30	10	10	10
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.43	Effective pHOS ->	Effective pHOS -> 0.57	Effective pHOS -> 0.57	Effective pHOS -> 0.57
"Fitness Floor" -> 0.5		pNOB -> 0.05	pNOB ->	pNOB -> 0.50	pNOB -> 0.50	pNOB -> 0.50
Calculated Hatchery SAR ->	0.1%		0.3%	0.3%	0.3%	
Calculated Natural SAR ->	0.8%		0.8%	0.8%	0.8%	

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	146	10	41	239	19	89	724	17	154	714	15	151	742	20	159
HoS Total Escapement (includes strays)	122	21	39				772	134	252	755	131	247	801	139	262

Table A5. *AHA* output for Lolo Creek Spring Chinook, Clearwater River (Nez Perce Tribal Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Spring Chinook
5-Clearwater_Lolo Creek Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Conservation
Harv&Hatchery Strategy:		Integrated + Supplementation	Natural Reproduction only	Integrated + Supplementation	Integrated + Supplementation	Integrated + Supplementation
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		185,524	161		185,524	161		185,524	161		185,524	161		185,524	161		185,524
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500	1.30		1,500
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050
	Harv -Terminal		NORs		HORs	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005
	Total Exploitation Rate		NORs		HORs	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal							100%			100%			100%		
			PNI		pHOS-Realized			39%				0.70		43%	0.70		43%	0.70		43%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		Int	Cons		None	Cons		Int	Cons		Int	Cons		Int
	Broodstock by Source		Local / Imported		Smolt Release	64	48	150,535				76		100,990	76		100,990	76		100,990
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			14						22			16			30
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	50%		50%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	1.0		y			y	4.0		y	4.0		y	4.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

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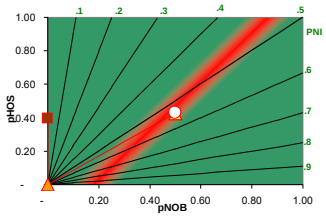
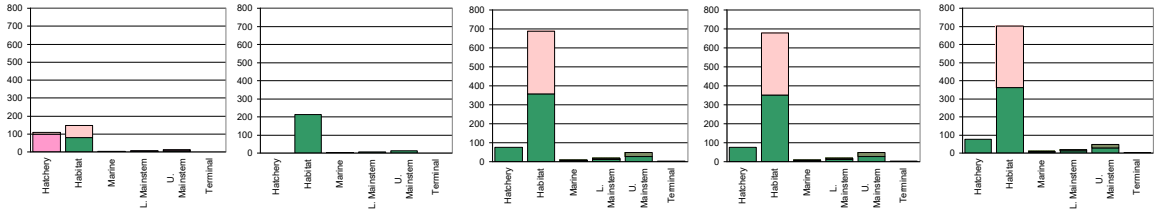
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.83	0.83	0.83
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.83	0.83	0.83
Generations until average fitness is reached ->		19	30	25	25	25
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.39	Effective pHOS ->	Effective pHOS -> 0.43	Effective pHOS -> 0.43	Effective pHOS -> 0.43
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB -> 0.50	pNOB -> 0.50	pNOB -> 0.50
Calculated Hatchery SAR ->		0.1%		0.3%	0.3%	0.3%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	280	23	81	575	44	214	1,473	69	357	1,452	66	352	1,498	72	363
HoS Total Escapement (includes strays)	216	34	66				1,014	176	332	995	172	326	1,038	180	340

Table A6. *AHA* output for Nez Perce Tribal Hatchery Spring Chinook, Clearwater River

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Clearwater	Spring Chinook
6C-Clearwater_Lower Mainstem_Spring Chinook (NPTH-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		1	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source	Local / Imported	Smolt Release			83		124,635				83		124,635	83		124,635	83		124,635
	Brood Exported (from HOR Surplus)	Export Goal/Realized	Strays			120	120					120	120		120	120		120	120	
	Destination for HOR Returns	% to Hatchery	% to Nat. Spawn.			90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish	Recruits/Spawner	Fitness? [Y / N]			4.2		y			y	4.2		y	4.2		y	4.2		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

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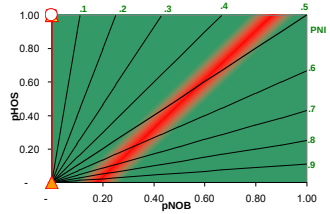
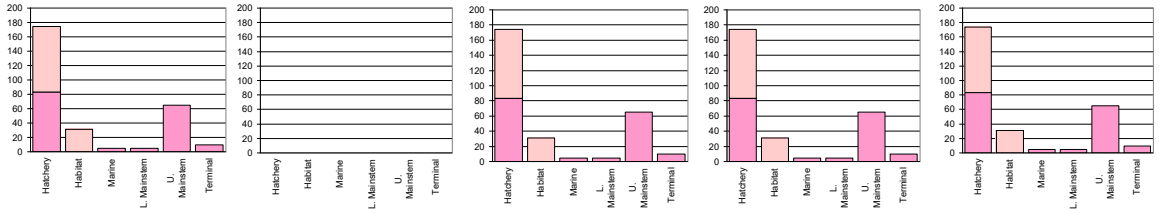
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.3%			0.3%	0.3%	0.3%
Calculated Natural SAR ->	0.8%		0.8%	0.8%		0.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement		0	0				0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	97	16	31							97	16	31	97	16	31	97	16	31

Table A7. *AHA* output for Lochsa River Spring Chinook (Powell Satellite Facility and Clearwater Fish Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Spring Chinook
1-Clearwater_Lochsa Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Harvest and Conservation	Reintroduction: Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Conservation
Harv&Hatchery Strategy:		Segregated Hatchery + Imports	Natural Reproduction Only	Segregated Hatchery	Segregated Hatchery	Integrated Hatchery
Population Recovery Designation:		Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU	Not listed; excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		940	1.30		940	1.30		940	1.30		940	1.30		940	1.30		940
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		116,265	161		116,262	161		116,262	161		116,262	161		116,262	161		116,262
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		940	1.30		940	1.30		940	1.30		940	1.30		940	1.30		940
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.050
	Harv -Terminal		NORs		HORs	0.050		0.200	0.050		0.200	0.050		0.200	0.050		0.200	0.050		0.050
	Total Exploitation Rate		NORs		HORs	0.124		0.330	0.124		0.330	0.124		0.330	0.124		0.330	0.124		0.124
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal													75%		
			PNI		pHOS-Realized			47%						59%			53%	0.50		74%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Seg	Cons		None	Both		Seg	Both		Seg	Cons		Int
	Broodstock by Source		Local / Imported		Smolt Release	236		401,436				412		700,812	236		401,436	177		300,681
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays	460	460	11				274	274	14	386	386	12	258	258	13
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	80%		20%	80%		20%	30%		70%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	6.0		y			y	6.0		y	6.0		y	6.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

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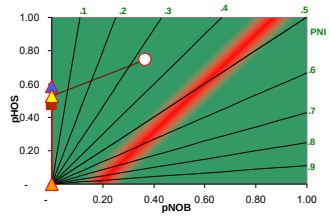
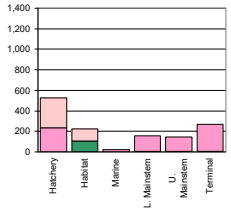
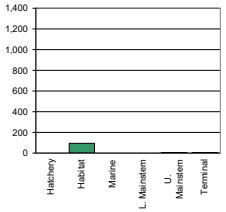
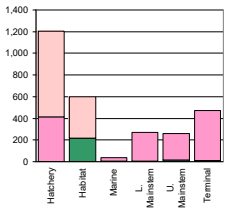
1

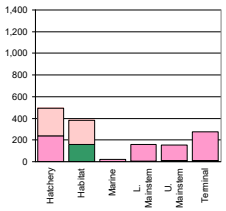
Realized Spawning Composition

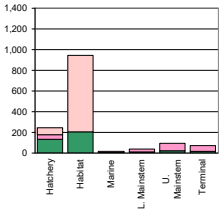












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.63
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.66
Generations until average fitness is reached ->		17	30	15	16	38
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.47	Effective pHOS ->	Effective pHOS -> 0.59	Effective pHOS -> 0.53	Effective pHOS -> 0.74
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB -> 0.37
Calculated Hatchery SAR ->		0.4%		0.4%	0.4%	0.4%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	371	33	105	262	17	92	800	82	216	584	56	159	1,109	0	204
HoS Total Escapement (includes strays)	358	62	117				1,172	203	383	682	118	223	2,257	392	738

Table A8. *AHA* output for Lower Selway River Spring Chinook, including Meadow Creek, Lochsa River Stock (Clearwater Fish Hatchery and Nez Perce Tribal Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

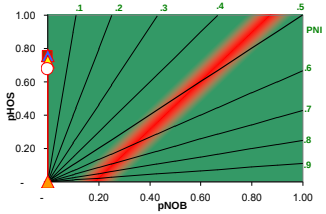
Subregion/Subbasin	*Species/Race*
Clearwater	Spring Chinook
2-Clearwater_Lower Selway Spring Chinook	

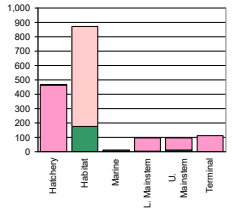
	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Harvest and Conservation	Reintroduction: Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation
Harv&Hatchery Strategy:		Segregated hatchery + supplementation	Natural Reproduction only	Segregated hatchery	Segregated hatchery	Segregated hatchery + supplementation
Population Recovery Designation:		Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU

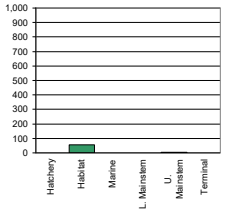
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		400	1.30		400	1.30		400	1.30		400	1.30		400	1.30		400
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		49,628	161		49,473	161		49,473	161		49,473	161		49,473	161		49,473
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		400	1.30		400	1.30		400	1.30		400	1.30		400	1.30		400
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.140	0.005		0.140	0.005		0.140	0.005		0.140	0.005		0.140
	Total Exploitation Rate		NORs		HORs	0.083		0.279	0.083		0.279	0.083		0.279	0.083		0.279	0.083		0.279
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal														10%	
			PNI		pHOS-Realized			76%						76%			72%			68%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Seg	Cons		None	Both		Seg	Both		Seg	Cons		Seg
	Broodstock by Source		Local / Imported		Smolt Release		466	730,053					466	730,053		200	300,326		134	201,219
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			11						20			14			29
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	1.8		y			y	1.8		y	3.2		y	3.2		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

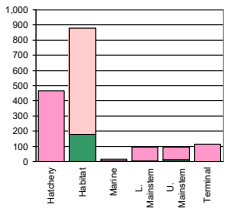
785
3

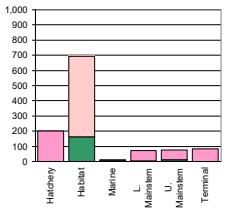
Realized Spawning Composition

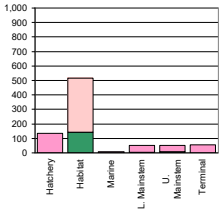












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		13	30	13	14	14
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.76	Effective pHOS ->	Effective pHOS -> 0.76	Effective pHOS -> 0.72	Effective pHOS -> 0.68
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->		0.1%		0.1%	0.2%	0.2%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	624	82	178	153	12	57	626	83	179	580	72	163	518	61	143
HoS Total Escapement (includes strays)	2,115	367	692				2,143	372	701	1,615	280	529	1,142	198	374

Table A9. *AHA* output for Upper Selway River Spring Chinook, Lochsa River Stock (Clearwater Fish Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Spring Chinook
3-Clearwater_Upper Selway Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Reintroduction: Conservation	Reintroduction: Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation	Reintroduction: Harvest and Conservation
Harv&Hatchery Strategy:		Segregated Hatchery + Supplementation	Natural Reproduction only	Integrated Hatchery + Supplementation	Segregated Hatchery + Supplementation	Segregated Hatchery + Supplementation
Population Recovery Designation:		Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU	Not listed: excluded from ESU

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.30		600	1.30		600	1.30		600	1.30		600	1.30		600	1.30		600
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	161		74,442	161		74,210	161		74,210	161		74,210	161		74,210	161		74,210
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.30		600	1.30		600	1.30		600	1.30		600	1.30		600	1.30		600
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050
	Harv -Terminal		NORs		HORs	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005
	Total Exploitation Rate		NORs		HORs	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal							100%								
			PNI		pHOS-Realized			54%				0.61		63%			54%			51%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Seg	Cons		None	Cons		Int	Both		Seg	Cons		Seg
	Broodstock by Source		Local	Imported	Smolt Release		186	300,516				68		101,507		186	300,516		124	200,344
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			10						16			11			27
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	0.9		y			y	3.2		y	0.9		y	0.9		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			HRT-Pref.		
	Update		Hatchery																	

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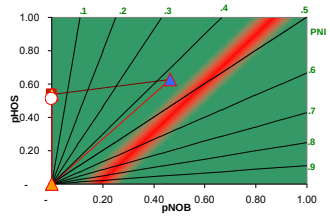
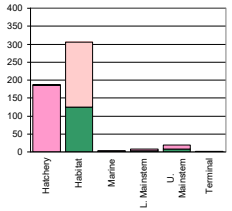
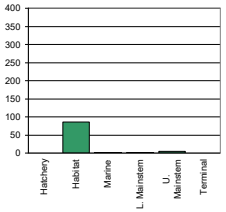
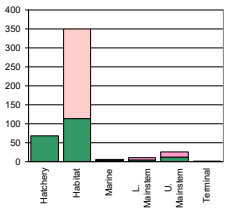
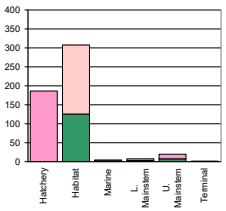
Realized Spawning Composition

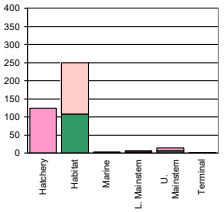












		Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->			80	80	80	80	80
Weir Factor ->							
Relative Reproductive Success (HOS) ->			80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->			0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->			0.50	1.00	0.74	0.50	0.50
Average Fitness Factor (100 Generations) ->			0.50	0.99	0.75	0.50	0.50
Generations until average fitness is reached ->			16	30	22	16	16
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	0.54	Effective pHOS ->	Effective pHOS -> 0.63	Effective pHOS -> 0.54	Effective pHOS -> 0.51
"Fitness Floor" ->	0.5	pNOB ->		pNOB ->	pNOB -> 0.46	pNOB ->	pNOB ->
Calculated Hatchery SAR ->		0.1%			0.2%	0.1%	0.1%
Calculated Natural SAR ->		0.8%		0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	459	46	125	230	18	86	602	1	113	461	46	125	394	38	108
HoS Total Escapement (includes strays)	552	95	180				727	126	237	557	96	182	430	74	141

Tables A10-A17: *AHA* outputs for Clearwater River Major Population Group (MPG) of summer steelhead

Parameters and assumptions for summer steelhead in the Clearwater River Major Population Group (MPG)

Productivity and survival parameters for hatchery-origin steelhead released within the Clearwater River basin (Table 3A) were obtained from the HSRG, as provided by Idaho Department of Fish and Game (IDFG).

Table 3A. Mean values of reproductive and survival parameters assumed in the AHA analyses for hatchery-origin steelhead released within the Clearwater River MPG.

Hatchery/ Release location ***Population/Stock***	**Female Fecundity (No. of eggs)**	**Within-hatchery survival (egg-to-smolt)**	**Post-release survival (%) (smolt-to-adult)**	**Recruit/spawner (R/S; adults)**
Dworshak NFH *Dworshak NFH Steelhead*	6,848	0.74	0.78%	35.0
Dworshak NFH/ Clear Creek, Kooskia NFH *Dworshak NFH Steelhead*	6,848	0.74	0.78%	35.0
Dworshak NFH, Clearwater FH/ S.F. Clearwater River, Red House *Dworshak NFH Steelhead*	6,848	0.74	0.78%	35.0
Dworshak NFH, Clearwater FH/ Upper S.F. Clearwater River *Dworshak NFH Steelhead*	6,848	0.74	0.78%	35.0
Clearwater FH/ Lolo Creek *Dworshak NFH Steelhead*	6,848	0.74	0.78%	35.0

Current programs, HSRG solutions, and HRT alternatives

The HRT modeled *Alternative 1* and its preferred alternatives for each of the steelhead hatchery programs conducted within the Clearwater River basin. Each population release site consists of five scenarios: *Current* program, *No Hatchery* scenario, *HSRG Solution*, *HRT Alternative 1*, and the *HRT Preferred Alternative* (Table 4A). The *HRT Preferred Alternative* assumes that reestablishment of naturally spawning populations is the principal goal of hatchery programs in the upper South Fork Clearwater River, including natural spawning locations in Crooked River, Red River, American River, Newsome Creek, Meadow Creek, and Mill Creek. The *HRT Preferred Alternative* emphasizes harvest in the lower S.F. Clearwater River (Red House release site) and mainstem Clearwater River downstream from Clear Creek and Kooskia NFH.

Table 4A. Summary of the number of hatchery-origin (HOR) steelhead smolts released in the Clearwater River under four strategies modeled in *AHA* Tables A10-A17: (1) *Current* programs based on the LSRCP Cooperators 2008 Annual Operating Plan for the Clearwater River, (2) the *HSRG Solution*, (3) *HRT Alternative 1* (current programs with implementation of HRT recommendations), and (4) *HRT Preferred Alternative*. All hatchery stocks are considered "*B-run*", and are primarily of Dworshak NFH origin. Release sites in the upper S.F. Clearwater River were pooled in the analyses (Red River, Crooked River, Newsome Creek, American River, Meadow Creek, and Mill Creek). The names of hatchery stocks/populations are in italics (e.g., "*Dworshak*") and are identified by the facility/location where adults are trapped for broodstock.

Release location	Current	HSRG Solution	HRT Alternative 1	HRT Preferred Alternative
Dworshak NFH, N.F. Clearwater River *(AHA Table A10)*	• 1.20M *Dworshak* smolts	No recommendation (same as Current)	Same as Current	Same as Current
Kooskia NFH, Clear Creek *(AHA Table A11)*	• 300K *Dworshak* smolts	• 300K *Kooskia* smolts	Same as HSRG	Same as HSRG
Lower S.F. Clearwater River at Red House *(AHA Table A12)*	• 665K *Dworshak* smolts	• 1.16M *Dworshak* smolts	• 1.4M *Dworshak* smolts	• 1.085M *Dworshak* smolts (release 315K *Dworshak* smolts in the Little Salmon River)
Upper S.F. Clearwater River, *(AHA Table A13)*	• 735K *Dworshak* smolts	• 124K *Upper S.F.* smolts (*pNOB* = 1.0)	Same as HSRG	Same as HSRG
Lolo Creek *(AHA Table A14)*	• 50K *Dworshak* smolts	• 50K *Lolo Cr.* smolts (*pNOB* = 1.0)	No recommendation (Same as HSRG)	No recommendation (Same as HSRG)

Table A10. *AHA* output for Dworshak NFH *B-run* Summer Steelhead, North Fork Clearwater River

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
5-Clearwater_NF Clearwater Summer Steelhead (B-Run-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Harvest and Conservation	Harvest and Conservation	Harvest and Conservation	Harvest and Conservation	Harvest and Conservation
Harv&Hatchery Strategy:		Segregated Hatchery + outplanting	Natural Reproduction only	Segregated Hatchery + outplanting	Segregated Hatchery + outplanting	Segregated Hatchery + outplanting
Population Recovery Designation:		N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	1		1	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release	484		1,201,814				484		1,201,814	484		1,201,814	484		1,201,814
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays	1,500	1,500					1,500	1,500		1,500	1,500		1,500	1,500	
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	35.0		y			y	35.0		y	35.0		y	35.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

450
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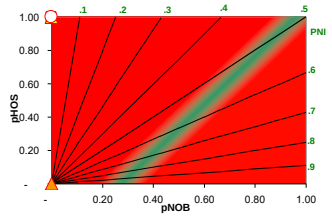
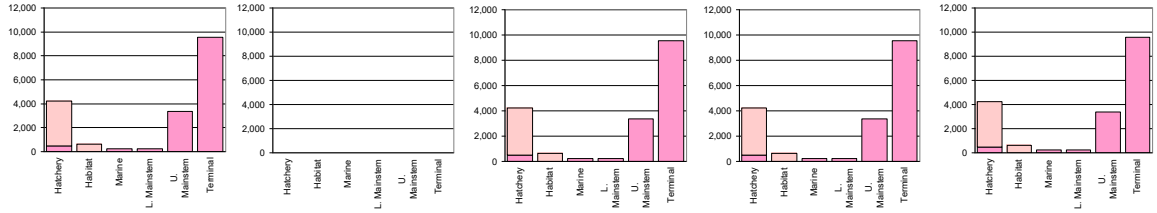
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	1.4%			1.4%	1.4%	1.4%
Calculated Natural SAR ->	1.8%		1.8%	1.8%	1.8%	1.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	1,946	338	637				1,946	338	637	1,946	338	637	1,946	338	637	1,946	338	637

Table A11. *AHA* output for Clear Creek *B-run* Summer Steelhead, Middle Fork Clearwater River (Dworshak NFH)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*		Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Clearwater	Summer Steelhead	*Population Management Intent:*	Harvest mitigation	Harvest mitigation	Harvest mitigation	Harvest mitigation	Harvest mitigation	Harvest mitigation
		Harv&Hatchery Strategy:	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
6A-Clearwater_Lower Clearwater Summer Steelhead (B-Run-Hatchery)		*Population Recovery Designation:*	N/A	N/A	N/A	N/A	N/A	N/A

			Historic		Current		No Hatchery		HSRG Solution		HRT Alternative #1		HRT Preferred Alternative	
Habitat	Productivity (Adult)	Ad. Capacity	2.00	100	2.00	100	2.00	100	2.00	100	2.00	100	2.00	100
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	50	2,500	110	5,522	110	5,522	110	5,522	110	5,522	110	5,522
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
	Adjusted Productivity	Adj. Capacity	0.91	45	2.00	100	2.00	100	2.00	100	2.00	100	2.00	100
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - U. Mainstem		NORs	HORs	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Harv -Terminal		NORs	HORs	0.030	0.600	0.030	0.600	0.030	0.600	0.030	0.600	0.030	0.600
	Total Exploitation Rate		NORs	HORs	0.182	0.663	0.182	0.663	0.182	0.663	0.182	0.663	0.182	0.663
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal										
			PNI	pHOS-Realized		74%				81%		56%		56%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Harv	Seg	Cons	None	Harv	Seg	Harv	Seg	Harv	Seg
	Broodstock by Source		Local / Imported	Smolt Release	122	302,936			122	302,936	122	302,936	122	302,936
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays										
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.	45%	55%		100%	45%	55%	90%	10%	90%	10%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	20.0	y		y	35.0	y	35.0	y	35.0	y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
			Hatchery											

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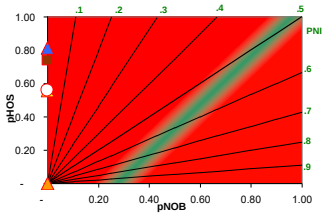
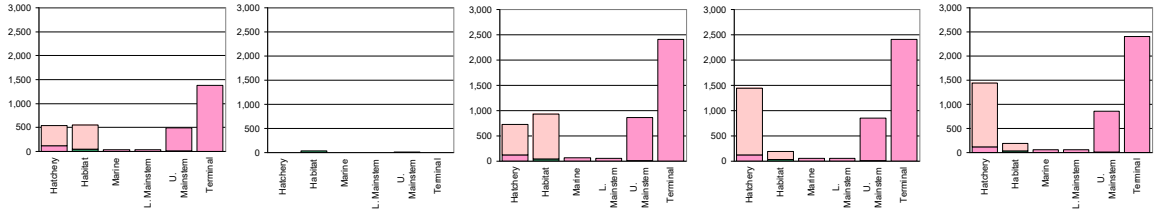
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		13	30	13	15	15
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.74	Effective pHOS ->	Effective pHOS -> 0.81	Effective pHOS -> 0.56	Effective pHOS -> 0.56
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.8%			1.4%	1.4%	1.4%
Calculated Natural SAR ->	1.8%		1.8%	1.8%	1.8%	1.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	153	22	45	109	12	34	167	25	50	114	13	32	114	13	32			
HoS Total Escapement (includes strays)	1,541	267	504				2,697	468	883	490	85	160	490	85	160			

Table A12. *AHA* output for Lower South Fork Clearwater River *B-run* Summer Steelhead (Dworshak NFH and Clearwater FH)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
3-Clearwater_SF Clearwater Summer Steelhead (B-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natrual Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
Population Recovery Designation:		Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing

			Historic		Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.50	350	1.50		350	1.50		350	1.50		350	1.50		350	1.50		350
	Min NOR Escape	% Kelt	1		1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	75	17,500	83		19,326	83		19,326	83		19,326	83		19,326	83		19,326
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)		0.018	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage			0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.36	317	1.50		350	1.50		350	1.50		350	1.50		350	1.50		350
Harvest	Harv - Marine		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs	HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs	HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs	HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery					pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal															
			PNI	pHOS-Realized			85%						90%			91%			89%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source	Local / Imported		Smolt Release		268	665,467					467	1,159,600		564	1,400,458		438	1,087,592
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays			268						240			168			168
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	35.0		y			y	35.0		y	35.0		y	35.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->		Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->		Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																

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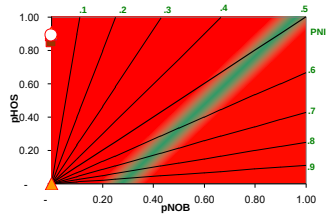
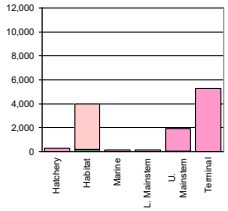
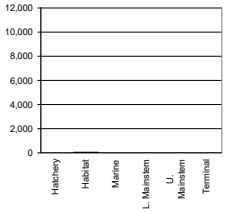
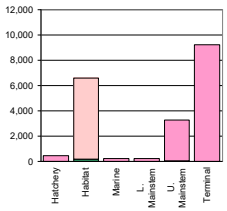
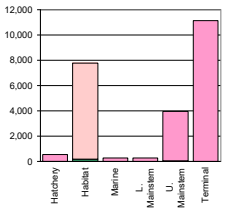
Realized Spawning Composition

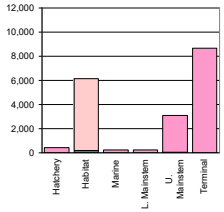












		Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	80%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		13	30	13	13	13
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.85	Effective pHOS ->	Effective pHOS -> 0.90	Effective pHOS -> 0.91	Effective pHOS -> 0.89
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->		1.4%		1.4%	1.4%	1.4%
Calculated Natural SAR ->		1.8%	1.8%	1.8%	1.8%	1.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	573	86	172	136	12	52	613	97	189	623	101	193	608	96	186
HoS Total Escapement (includes strays)	11,594	2,013	3,796				19,509	3,388	6,389	23,189	4,027	7,594	18,122	3,147	5,935

Table A13. *AHA* output for Upper South Fork Clearwater River *B-run* Summer Steelhead (Dworshak NFH and Clearwater FH)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
3-Clearwater_SF Clearwater_Crooked River	
Summer Steelhead (B-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Conservation and Harvest	Conservation	Conservation and Harvest	Conservation	Conservation
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Integrated Hatchery	Integrated Hatchery	Integrated Hatchery
Population Recovery Designation:		Contributing	Contributing	Contributing	Contributing	Contributing

			Historic		Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	1.50	400	1.50		400	1.50		400	1.50		400	1.50		400	1.50		400
	Min NOR Escape	% Kelt	1		1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	75	20,000	83		22,087	83		22,087	83		22,087	83		22,087	83		22,087
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)		0.018	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage			0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.36	362	1.50		400	1.50		400	1.50		400	1.50		400	1.50		400
Harvest	Harv - Marine		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs	HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs	HORs	0.030		0.200	0.030		0.200	0.030		0.200	0.030		0.200	0.030		0.200
	Total Exploitation Rate		NORs	HORs	0.182		0.326	0.182		0.326	0.182		0.326	0.182		0.326	0.182		0.326
Hatchery					pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal			30%				100%		30%	100%		30%	100%		30%
			PNI	pHOS-Realized			90%				0.55		83%	0.55		83%	0.55		83%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Both		Seg	Cons		None	Cons		Int	Cons		Int	Cons		Int
	Broodstock by Source		Local / Imported	Smolt Release		296	734,993				50		123,906	50		123,906	50		123,906
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays			35				300	300	61			74			58
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.			100%			100%	20%		80%	20%		80%	20%		80%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	35.0		y			y	35.0		y	35.0		y	35.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->		Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->		Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
	Update		Hatchery																

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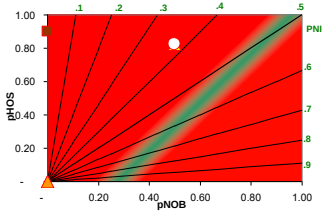
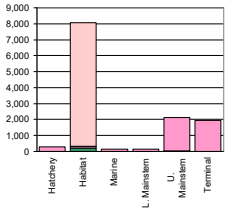
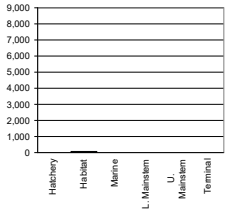
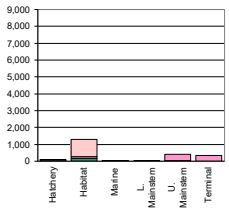
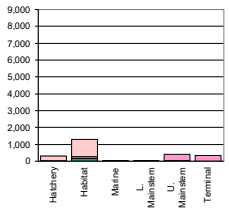
Realized Spawning Composition

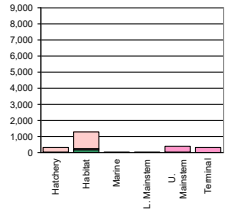












Relative Hatchery Optimum ->				80				80					80				80		
Weir Factor ->																			
Relative Reproductive Success (HOS) ->				25%				80%					80%				80%		
Initial Fitness Factor (A) ->				0.81				0.81					0.81				0.81		
Fitness Factor after 100 generations (B) ->				0.50				1.00					0.70				0.70		
Average Fitness Factor (100 Generations) ->				0.50				0.99					0.71				0.71		
Generations until average fitness is reached ->				13				30					35				35		
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.90			Effective pHOS ->				Effective pHOS ->	0.83		Effective pHOS ->	0.83		Effective pHOS ->	0.83	
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->				pNOB ->	0.50		pNOB ->	0.50		pNOB ->	0.50	
Calculated Hatchery SAR ->			1.4%								1.4%			1.4%			1.4%		
Calculated Natural SAR ->			1.8%				1.8%				1.8%			1.8%			1.8%		
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			704	113	217	155	14	59	723	63	181	724	63	182	723	63	181		
HoS Total Escapement (includes strays)			23,910	4,153	7,830				3,398	590	1,112	3,436	596	1,125	3,386	588	1,108		

Table A14. *AHA* output for Lolo Creek *A+B-run* Summer Steelhead (Clearwater Fish Hatchery)

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
4-Clearwater_Lolo Summer Steelhead (A+B-Run)	

Population Management Intent:				Harvest and Conservation			Conservation			Harvest and Conservation			Harvest and Conservation			Harvest and Conservation			
Harv&Hatchery Strategy:				Segregated Hatchery + supplementation			Natural Reproduction only			Integrated Hatchery + supplementation			Integrated Hatchery + supplementation			Integrated Hatchery + supplementation			
Population Recovery Designation:				Contributing			Contributing			Contributing			Contributing			Contributing			
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	2.00		200	2.00		200	2.00		200	2.00		200	2.00		200	2.00		200
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	100		10,000	110		11,043	110		11,043	110		11,043	110		11,043	110		11,043
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.81		181	2.00		200	2.00		200	2.00		200	2.00		200	2.00		200
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal			30%				100%		30%	100%		30%	100%		30%
			PNI		pHOS-Realized			68%				0.55		83%	0.55		83%	0.58		73%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		Seg	None		None	Cons		Int	Cons		Int	Cons		Int
	Broodstock by Source		Local / Imported		Smolt Release		20	49,662				20		49,413	20		49,413	20		49,413
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			139						107			102			85
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	10%		90%			100%			100%			100%	50%		50%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	35.0		y			y	35.0		y	35.0		y	35.0		y
Patterns / **Update**	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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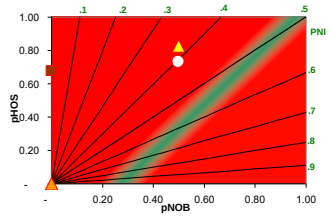
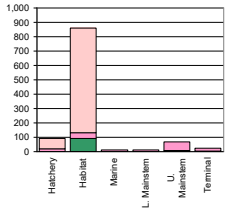
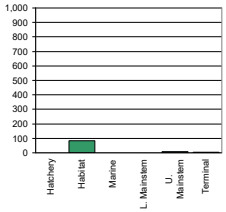
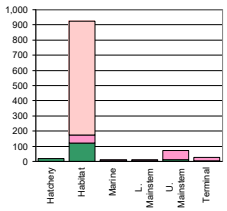
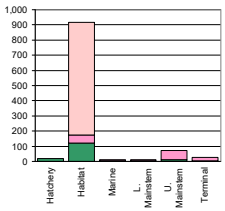
Realized Spawning Composition

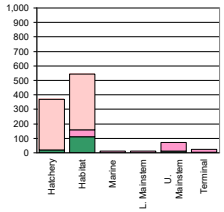












Relative Hatchery Optimum ->				80					80					80				80		
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				25%					80%					80%				80%		
Initial Fitness Factor (A) ->				0.81					0.81					0.81				0.81		
Fitness Factor after 100 generations (B) ->				0.50					1.00					0.70				0.70		
Average Fitness Factor (100 Generations) ->				0.50					0.99					0.71				0.71		
Generations until average fitness is reached ->				14					30					35				35		
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.68			Effective pHOS ->					Effective pHOS ->	0.83			Effective pHOS ->	0.83			Effective pHOS ->	0.73	
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->					pNOB ->	0.50			pNOB ->	0.50			pNOB ->	0.50	
Calculated Hatchery SAR ->			1.4%									1.4%				1.4%				1.4%		
Calculated Natural SAR ->			1.8%				1.8%					1.8%				1.8%				1.8%		
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			319	43	92	283	33	85	439	53	122	439	53	122	418	45	112			
HoS Total Escapement (includes strays)			2,342	407	767				2,447	425	801	2,431	422	796	1,321	229	432			

Table A15. *AHA* output for Lower Clearwater River *A-run* Summer Steelhead

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
6-Clearwater_Lower Clearwater Summer Steelhead (A-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic		Current			No Hatchery			HSRG Solution			HRT Alternative #1			HRT Preferred Alternative		
Habitat	Productivity (Adult)	Ad. Capacity	5.21	1,430	5.21		1,430	5.21		1,430	5.21		1,430	5.21		1,430	5.21		1,430
	Min NOR Escape	% Kelt	1		1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	261	71,500	261		71,511	261		71,511	261		71,511	261		71,511	261		71,511
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)		0.020	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage			0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	5.21	1,430	5.21		1,430	5.21		1,430	5.21		1,430	5.21		1,430	5.21		1,430
Harvest	Harv - Marine		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs	HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs	HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs	HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs	HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery					pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal			5%			5%			5%			5%			5%
			PNI	pHOS-Realized			1%						2%			1%			1%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	None		None	None		None	None		None	None		None	None		None
	Broodstock by Source		Local / Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays			58						76			40			40
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	35.0		y			y	35.0		y	35.0		y	35.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->		Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->		Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																

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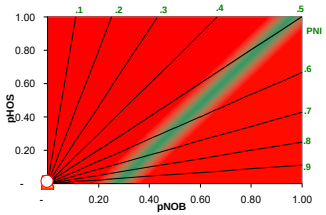
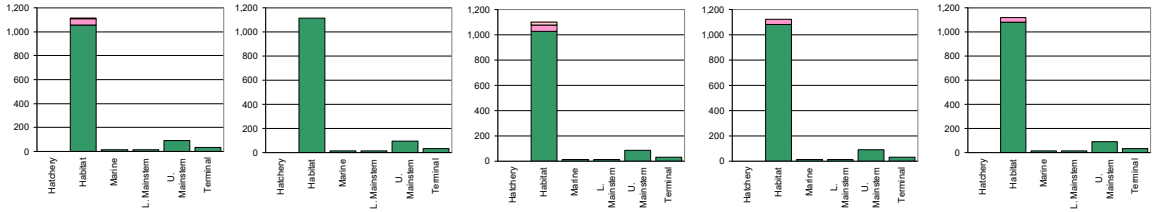
Realized Spawning Composition





Relative Hatchery Optimum ->				80				80					80				80		
Weir Factor ->																			
Relative Reproductive Success (HOS) ->				25%				25%					25%				25%		
Initial Fitness Factor (A) ->				0.81				0.81					0.81				0.81		
Fitness Factor after 100 generations (B) ->				0.91				1.00					0.86				0.95		
Average Fitness Factor (100 Generations) ->				0.92				0.99					0.89				0.95		
Generations until average fitness is reached ->				18				30					11				25		
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.01			Effective pHOS ->			Effective pHOS ->	0.02		Effective pHOS ->	0.01		Effective pHOS ->	0.01		
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->			pNOB ->			pNOB ->			pNOB ->			
Calculated Hatchery SAR ->			3.5%							3.5%			3.5%			3.5%			
Calculated Natural SAR ->			2.0%				2.0%			2.0%			2.0%			2.0%			
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			3,501	528	1,056	3,695	567	1,115	3,393	504	1,025	3,585	546	1,081	3,585	546	1,081			
HoS Total Escapement (includes strays)			176	31	58				234	41	76	123	21	40	123	21	40			

Table A16. *AHA* output for Lochsa River *B-run* Summer Steelhead

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
1-Clearwater_Lochsa Summer Steelhead (B-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproducton only	Natural Reproducton only	Natural Reproducton only	Natural Reproducton only	Natural Reproducton only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary
Habitat						
Productivity (Adult) / Ad. Capacity	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000
Min NOR Escape / % Kelt	1	1	1	1	1	1
Smolt Productivity / Sm. Capacity	125 / 100,000	138 / 110,434	138 / 110,434	138 / 110,434	138 / 110,434	138 / 110,434
Hydro						
Ocean Surv / Baseline SAR / Vary? (Y/N)	0.098 / 0.018 / y	0.048 / 0.018 / y	0.048 / 0.018 / y	0.048 / 0.018 / y	0.048 / 0.018 / y	0.048 / 0.018 / y
Juv Passage Surv. / Adult Passage	1.00 / 1.00	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77
Adjusted Productivity / Adj. Capacity	2.26 / 1,811	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000	2.50 / 2,000
Harvest						
Harv - Marine	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - L. Mainstem	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - U. Mainstem	NORs / HORs	0.140 / 0.140	0.140 / 0.140	0.140 / 0.140	0.140 / 0.140	0.140 / 0.140
Harv -Terminal	NORs / HORs	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030
Total Exploitation Rate	NORs / HORs	0.182 / 0.182	0.182 / 0.182	0.182 / 0.182	0.182 / 0.182	0.182 / 0.182
Hatchery						
		pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS
Broodstock Composition	pNOB-Goal / pHOS-Goal	5%	5%	5%	5%	5%
	PNI / pHOS-Realized	1%		1%	0%	0%
Purpose / Type	Cons/Harv/Both / Int/Seg/Step/None	None / None	None / None	None / None	None / None	None / None
Broodstock by Source	Local / Imported / Smolt Release					
Brood Exported (from HOR Surplus)	Export Goal/Realized / Strays	20		32	10	10
Destination for HOR Returns	% to Hatchery / % to Nat. Spawn.	100%	100%	100%	100%	100%
Productivity of Hatchery Fish	Recruits/Spawner / Fitness? [Y / N]	35.0 / y	35.0 / y	35.0 / y	35.0 / y	35.0 / y
Patterns						
Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.	Habitat ----->	Current Habitat	Current Habitat	Current Habitat	Current Habitat	Current Habitat
	Hydro ----->	Current Hydro	Current Hydro	Current Hydro	Current Hydro	Current Hydro
	Harvest --->	Current Harvest	Current Harvest	Current Harvest	Current Harvest	Current Harvest
	Hatchery					
Update						

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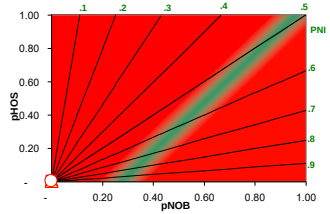
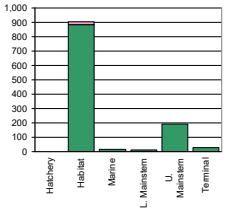
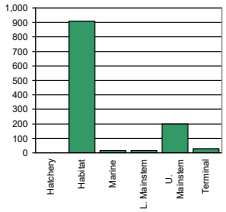
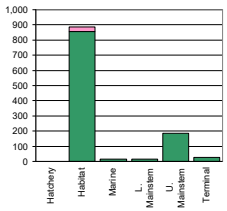
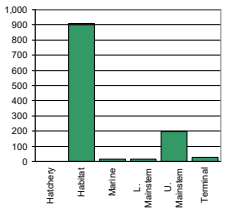
Realized Spawning Composition

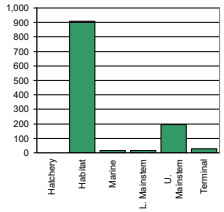












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	80%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.98	1.00	0.95	0.99	0.99
Average Fitness Factor (100 Generations) ->		0.97	0.99	0.95	0.99	0.99
Generations until average fitness is reached ->		32	30	26	32	32
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.01	Effective pHOS ->	Effective pHOS -> 0.01	Effective pHOS -> 0.00	Effective pHOS -> 0.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	1.2%			1.2%	1.2%	1.2%
Calculated Natural SAR ->	1.8%		1.8%	1.8%	1.8%	1.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative #1 Max	HRT Alternative #1 Min	HRT Alternative #1 Ave	HRT Preferred Alternative Max	HRT Preferred Alternative Min	HRT Preferred Alternative Ave
NOR Escapement	3,037	380	883	3,129	392	909	2,924	368	855	3,102	386	901	3,102	386	901			
HoS Total Escapement (includes strays)	61	11	20				97	17	32	30	5	10	30	5	10			

Table A17. *AHA* output for *B-run* Selway River Summer Steelhead

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Clearwater	Summer Steelhead
2-Clearwater_Selway Summer Steelhead (B-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative #1	HRT Preferred Alternative
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic		Current		No Hatchery		HSRG Solution		HRT Alternative #1		HRT Preferred Alternative	
Habitat	Productivity (Adult)	Ad. Capacity	2.50	2,500	2.50	2,500	2.50	2,500	2.50	2,500	2.50	2,500	2.50	2,500
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	125	125,000	138	138,046	138	138,046	138	138,046	138	138,046	138	138,046
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
	Adjusted Productivity	Adj. Capacity	2.26	2,264	2.50	2,500	2.50	2,500	2.50	2,500	2.50	2,500	2.50	2,500
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - U. Mainstem		NORs	HORs	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Harv -Terminal		NORs	HORs	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Total Exploitation Rate		NORs	HORs	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal		5%		5%		5%		5%		5%
			PNI	pHOS-Realized		0%				1%		0%		0%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	None	None	None	None	None	None	None	None	None	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		19				30		8		8
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	35.0	y		y	35.0	y	35.0	y	35.0	y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
			Hatchery											

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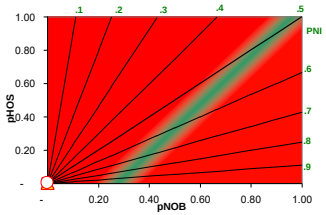
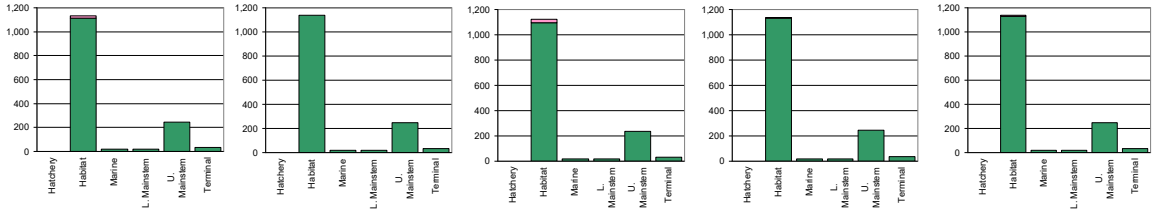
Realized Spawning Composition





Relative Hatchery Optimum ->				80				80				80				80
Weir Factor ->																
Relative Reproductive Success (HOS) ->				25%				25%				25%				25%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				0.99				1.00				0.97				1.00
Average Fitness Factor (100 Generations) ->				0.98				0.99				0.96				0.99
Generations until average fitness is reached ->				33				30				30				32
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	0.00			Effective pHOS ->			Effective pHOS ->	0.01		Effective pHOS ->	0.00		Effective pHOS ->	0.00
"Fitness Floor" ->	0.5	pNOB ->				pNOB ->			pNOB ->			pNOB ->			pNOB ->	
Calculated Hatchery SAR ->			1.2%						1.2%			1.2%			1.2%	
Calculated Natural SAR ->			1.8%			1.8%			1.8%			1.8%			1.8%	

	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement	3,842	479	1,116	3,911	489	1,136	3,754	472	1,094	3,893	485	1,130	3,893	485	1,130
HoS Total Escapement (includes strays)	57	10	19				91	16	30	25	4	8	25	4	8

Tables A18-A39: *AHA* outputs for Salmon River Summer Steelhead

Parameters and assumptions for Salmon River steelhead

Steelhead smolts from several hatchery populations are currently released into the Salmon River drainage. These hatchery populations include Sawtooth Hatchery steelhead (*A-run*), Pahsimeroi Hatchery steelhead (*A-run*), Oxbow Hatchery steelhead (*A-run*), Dworshak NFH steelhead (*B-run*), Squaw Creek *B-run* hatchery steelhead representing the offspring/descendants of Dworshak NFH steelhead returning to Squaw Creek, and East Fork "Naturals" steelhead (*A/B run*) which are the offspring/descendants of natural-origin steelhead trapped in the East Fork Salmon River. Each of these steelhead stocks has characteristic mean female fecundities, mean egg-to-smolt survivals depending on hatchery, mean smolt-to-adult survival rates, and mean numbers adult recruits per adult spawner (*R/S*). Values of these various parameters for generating *AHA* Tables A18-A39 are presented in Table 5A.

Table 5A. Mean values of reproductive and survival parameters assumed in the AHA analyses for hatchery-origin steelhead released within the Salmon River drainage (data obtained from the HSRG). Some of the values below represent updated estimates obtained by the HRT.

Hatchery/ Release location *Population/Stock*	**Fecundity (No. of eggs)**	**Within-hatchery egg-to-smolt survival**	**Salmon River smolt-to-adult survival (%)**	**Recruit/spawner (R/S; adults)**
Hagerman NFH, Magic Valley FH, Niagara Springs FH/ Salmon River basin *Oxford, Pahsimeroi,* and *Sawtooth Hatchery A-run Steelhead*	4,912	0.75	0.70%	12.9
Hagerman NFH, Magic Valley FH/ Salmon River basin *Dworshak NFH B-run Steelhead*	6,848	0.56	0.14%	2.5
Clearwater FH/ Little Salmon River *Dworshak NFH B-run Steelhead*	6,848	0.75	0.14%	3.4
Magic Valley FH, Niagara Springs FH/ Salmon River basin *Localized B-run Steelhead*	6,000	0.67	0.40%	7.8
Magic Valley FH/ E.F. Salmon River, Current *East Fork "Naturals" steelhead*	6,000	0.70	0.19%	4.0
Magic Valley FH/ Salmon River basin, under HSRG and HRT recommendations *East Fork "Naturals" steelhead*	6,000	0.70	0.34%	7.1

Current programs, HSRG solutions, and HRT alternatives

Tables A18-A39 simulate published *HSRG solutions* and two sets of HRT alternatives referred to as *HRT Alternatives A* and *HRT Alternatives B*. *HRT Alternatives A* and *B* are identical except *HRT Alternative A* models a localized hatchery population of *B-run* steelhead on the Pahsimeroi River, whereas *HRT Alternative B* terminates all *B-run* hatchery programs and replaces those released numbers of fish with *A-run* steelhead (Table 6A).

The HSRG solutions and the two HRT sets of alternatives modeled here terminate the annual transfer and outplanting of *Dworshak NFH B-run steelhead* smolts in the East Fork Salmon River and at Squaw Creek. Instead, the *HSRG Solution* and *HRT Alternative "A"* scenarios are based on the development of localized hatchery populations of *B-run* steelhead for the upper Salmon River. The *HSRG Solution* models this "localized" hatchery population for the East Fork Salmon River, assuming construction of a new weir in the East Fork immediately upstream from its confluence with the mainstem Salmon River. *HRT Alternative A* models a localized hatchery broodstock on the Pahsimeroi River because trapping facilities are already in place there. In this context, the HSRG solution can be viewed as a potential "long-term recommendation", while *HRT Alternative A* can be viewed as a "short-term recommendation".

The *HSRG Solution* and HRT alternatives for the Little Salmon River hatchery programs maintain the current release numbers of both *A-run* and *Dworshak NFH B-run steelhead*. However, the HRT is recommending that Clearwater FH, rather than Hagerman NFH or Magic Valley FH, rear *Dworshak B-run steelhead* released in the Little Salmon River because of the greater in-hatchery survivals and recruit-per-spawners associated with rearing at Clearwater FH.

The HRT further recommends that all *Sawtooth A-run steelhead* be reared at Hagerman NFH and that *all Pahsimeroi A-run steelhead* be reared at Magic Valley and Niagara Springs FH. Currently, approximately 1.45M and 1.59M steelhead smolts are reared annually at Hagerman NFH and Magic Valley FH, respectively. The "HSRG Solutions" in Tables A19-A39 assume that those numbers would remain unchanged. The two sets of HRT alternatives would reduce those numbers slightly to 1.40 and 1.55M smolts, respectively. Further reductions may be necessary in response to declining water supplies at both facilities.

Table 6A. Summary of the number of hatchery-origin (HOR) steelhead smolts released in the Salmon River under four strategies modeled in AHA Tables A18-A39: (1) *Current* programs based on the LSRCP Cooperators 2008 Annual Operating Plan for the Salmon River, (2) the *HSRG Solution*, (3) *HRT Alternative A* (development of localized hatchery populations of *B-run* steelhead) and *HRT Alternative B* (A-run steelhead programs only). The names of hatchery stocks/populations are in italics (e.g., "*Oxbow*", "*Pahsimeroi*") and are identified by the facility/location where adults are trapped for broodstock. Hatcheries where juvenile fish are reared to the smolt stage prior to release are shown in parentheses. The *HSRG solution* assumes construction of new weirs in the lower Lemhi River and the lower East Fork Salmon River.

Release location: Program	Current	HSRG Solution	HRT Alternative A	HRT Alternative B
Little Salmon River: *A-run* *(AHA Tables A18, A19)*	• 275K *Oxbow* smolts (Niagara Springs FH) • 170K *Pahsimeroi* smolts (Niagara Springs FH) • 200K *Pahsimeroi* smolts (Hagerman NFH)	No recommendation (same as Current)	• 275K *Oxbow* smolts (Niagara Springs FH) • 370K *Pahsimeroi* smolts (Magic Valley FH)	Same as HRT Alt. A
Little Salmon River: *B-run* *(AHA Table A20)*	• 215K *Dworshak* smolts (Magic Valley FH) • 100K *Dworshak* smolts (Hagerman NFH)	No recommendation (same as Current)	• 315 K *Dworshak* smolts (Clearwater FH)	Same as HRT Alt. A
Salmon River at Red Rock: *A-run* *(AHA Tables A28, A29)*	• 120K *Pahsimeroi* smolts (Magic Valley FH)	New conservation weir in lower Lemhi River	Terminate smolt releases at Red Rock site	Same as HRT Alt. A
Salmon River at Shoup Bridge: *A-run* *(AHA Tables A30, A31)*	• 80K *Pahsimeroi* smolts (Magic Valley FH)	No recommendation (same as Current)	• 120K *Pahsimeroi* smolts (Magic Valley FH)	Same as HRT Alt. A
Salmon River at Colston Corner: *A-run* (*AHA Table A30, A31)*	• 140K *Pahsimeroi* or *Sawtooth* smolts (Magic Valley FH)	No recommendation (same as Current)	• 180K *Pahsimeroi* smolts (Magic Valley FH)	Same as HRT Alt. A
Pahsimeroi River at hatchery weir: *A-run* *(AHA Table A30, A31)*	• 830K *Pahsimeroi* smolts (Niagara Springs FH) • 30K *Pahsimeroi* smolts (Magic Valley FH)	No recommendation (same as Current)	• 900K *Pahsimeroi* smolts (Niagara Springs FH)	• 1.15M *Pahsimeroi* smolts (Niagara Springs FH)
Pahsimeroi River at hatchery weir: *B-run* *(AHA Table A32)*	No program	Same as Current	• 250K *localized Dworshak* smolts, Pahsimeroi broodstock. (Magic Valley FH)	Same as Current
Salmon River at	• 120K *Pahsimeroi* or *Sawtooth*			

McNabb Point *(AHA Table A33)*	A-run smolts (Magic Valley FH)	• 120K *East Fork "F2" HOR Naturals* (Magic Valley FH)	Same as HSRG Solution	Same as HSRG Solution
Salmon River at Tunnel Rock *(AHA Table A33)*	• 60K *Pahsimeroi* or *Sawtooth* A-run smolts (Magic Valley FH)	• 60K *East Fork "F2" HOR Naturals* (Magic Valley FH)	Same as HSRG Solution	Same as HSRG Solution
E.F. Salmon River at existing weir (RM 18): *E.F. "Naturals" (AHA Table A34)*	• 60K *E.F. Naturals* (pNOB = 0.5) (Magic Valley FH)	Terminate releases at existing weir	• 150K *E.F. Naturals* (pNOB = 0.75), released upstream of weir (Magic Valley FH)	Same as HSRG solution
E.F. Salmon River at mouth (RM 1.0): *E.F. "Naturals" (AHA Tables A33, A34)*	No program	• Construct new weir at mouth • 100K *E.F. Naturals* (pNOB = 0.75) (Magic Valley FH)	• 325K *East Fork "F2" HOR Naturals* (Magic Valley FH)	• Construct new weir at mouth • 150K E.F. Naturals (*pNOB* = 0.75) (Magic Valley FH) • 325K *East Fork "F2" HOR Naturals* (Magic Valley FH)
E.F. Salmon River at mouth (RM 1): *B-run (AHA Table A35)*	• 225K *Dworshak* smolts (Magic Valley FH) • 100K *Dworshak* smolts (Hagerman NFH)	• Construct new weir at mouth • 325K *localized Dworshak* smolts, E.F. broodstock (Magic Valley FH)	No program	No program
Squaw Creek and Pond: *B-run (AHA Tables A36, A37)*	• 60K *localized Dworshak* smolts, Squaw Cr. broodstock (Magic Valley FH) • 250K *Dworshak* smolts (Magic Valley FH)	• 270K *E.F. Salmon River localized Dworshak* smolts (Magic Valley FH)	• 60K *localized Dworshak* smolts, Squaw Cr. broodstock (Magic Valley FH)	No program
Slate Creek: *A-run (AHA Tables A38, A39)*	• 90K *Pahsimeroi* smolts (Magic Valley FH)	No recommendation (same as Current)	• 90K *Sawtooth* smolts (Hagerman NFH)	Same as HRT Alt. A
Yankee Fork, Salmon River: *A-run (AHA Tables A38, A39)*	• 240K *Sawtooth* smolts (Hagerman NFH) • 90K *Sawtooth* smolts (Magic Valley FH)	No recommendation (same as Current)	• 330K *Sawtooth* smolts (Hagerman NFH)	Same as HRT Alt. A
Valley Creek: *A-run (AHA Tables A38, A39)*	• 50K *Sawtooth* smolts (Magic Valley FH)	No recommendation (same as Current)	• 50K *Sawtooth* smolts (Hagerman NFH)	Same as HRT Alt. A
Salmon River at Sawtooth Hatchery weir: *A-run (AHA Tables A38, A39)*	• 810K *Sawtooth* smolts (Hagerman NFH)	No recommendation (same as Current)	• 930K *Sawtooth* smolts (Hagerman NFH)	Same as HRT Alt. A

Table A18. *AHA* output for Little Salmon River summer steelhead (*A-run*). Hatchery influence on this population is from outplanted *Dworshak NFH steelhead (B-run)*, and outplanted *Oxbow* and *Pahsimeroi Hatchery A-run steelhead* (see Tables A19 and A20).

All H Analyzer (AHA)

Apply & Recalculate

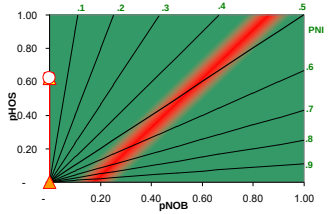
Population (Ctrl + Page Up/Down to Scroll)

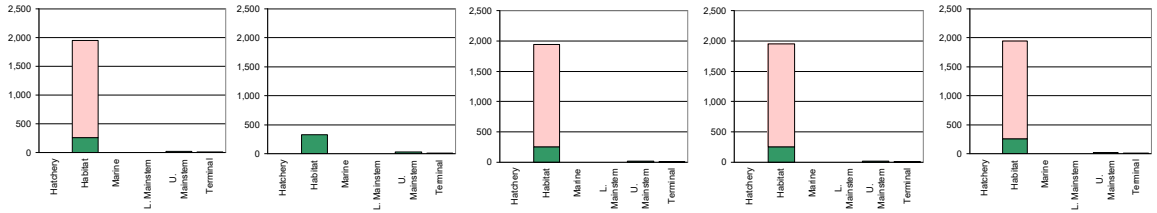
Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
12-Salmon_Little Salmon Summer Steelhead (A-Run)	

Population Management Intent:					Harvest			Conservation			Harvest			Harvest			Harvest		
Harv&Hatchery Strategy:					Segregated Hatchery			Natural Reproduction only			Segregated Hatchery			Segregated Hatchery			Segregated Hatchery		
Population Recovery Designation:					Stabilizing			Stabilizing			Stabilizing			Stabilizing			Stabilizing		
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	3.60		474	3.60		474	3.60		474	3.60		474	3.60		474	3.60		474
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	90		11,850	180		23,704	180		23,704	180		23,704	180		23,704	180		23,704
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.80		237	3.60		474	3.60		474	3.60		474	3.60		474	3.60		474
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			62%						62%			62%			62%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			1,688						1,688			1,691			1,691
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

549
1

Realized Spawning Composition





Relative Hatchery Optimum ->					80					80					80					80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->					80%					80%					80%					80%
Initial Fitness Factor (A) ->					0.81					0.81					0.81					0.81
Fitness Factor after 100 generations (B) ->					0.50					1.00					0.50					0.50
Average Fitness Factor (100 Generations) ->					0.50					0.99					0.50					0.50
Generations until average fitness is reached ->					14					30					14					14
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->		0.62			Effective pHOS ->					Effective pHOS ->		0.62			Effective pHOS ->		0.62
"Fitness Floor" ->	0.5		pNOB ->					pNOB ->					pNOB ->					pNOB ->		
Calculated Hatchery SAR ->																				
Calculated Natural SAR ->			2.0%					2.0%					2.0%					2.0%		
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			857	129	258	1,103	158	323	857	129	258	857	129	258	857	129	258	857	129	258
HoS Total Escapement (includes strays)			5,154	895	1,688				5,154	895	1,688	5,162	897	1,691	5,162	897	1,691			

Table A19. *AHA* output for *Oxbow* and *Pahsimeroi Hatchery A-run steelhead* released into the Little Salmon River.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

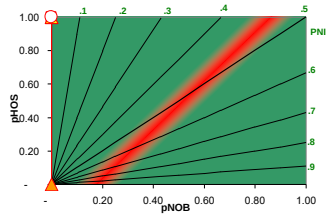
Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
12A-Salmon_Little Salmon Summer Steelhead (A-Run-Pahsimeroi-Oxbow-Hatchery)	

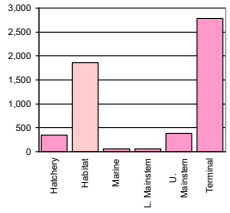
	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:	Harvest	Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:	Segregated Hatchery - Outplanting	Segregated Hatchery - Outplanting	Natural Reproduction only	Segregated Hatchery - Outplanting	Segregated Hatchery - Outplanting	Segregated Hatchery - Outplanting
Population Recovery Designation:	Not listed - excluded from DPS	Not listed - excluded from DPS	N/A	Not listed - excluded from DPS	Not listed - excluded from DPS	Not listed - excluded from DPS

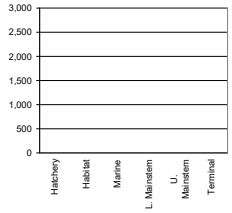
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release		350	644,700					350	644,700		350	644,700		350	644,700
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	12.9		y			y	12.9		y	12.9		y	12.9		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
	Update		Hatchery																	

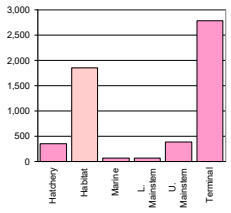
550
2

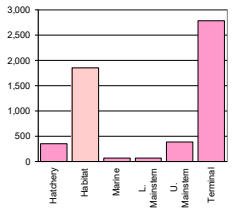
Realized Spawning Composition

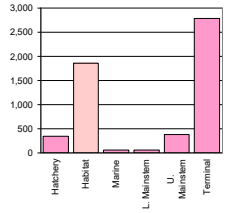












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.19	1.00	0.19	0.19	0.19
Average Fitness Factor (100 Generations) ->		0.24	0.99	0.24	0.24	0.24
Generations until average fitness is reached ->		43	30	43	43	43
Minimum Hatchery Program (% of BS Goal) ->	Effective pHOS ->	1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" ->	pNOB ->		pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.7%			0.7%	0.7%	0.7%
Calculated Natural SAR ->	2.0%		2.0%	2.0%	2.0%	2.0%

	Historic Max	Historic Min	Historic Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	5,669	984	1,856				5,669	984	1,856	5,669	984	1,856	5,669	984	1,856

Table A20. ***AHA*** **output for** ***Dworshak NFH steelhead (B-run)*** **released into the Little Salmon River.**

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*	*Population Management Intent:*	Harvest	Conservation	Harvest	Harvest	Harvest
Salmon	Summer Steelhead	*Harv&Hatchery Strategy:*	Segregated Hatchery - Outplanting	Natural Reproduction only	Segregated Hatchery - Outplanting	Segregated Hatchery - Outplanting	Segregated Hatchery - Outplanting
12B-Salmon_Little Salmon Summer Steelhead (B-Run-Dworshak-Hatchery)		*Population Recovery Designation:*	Not listed - excluded from DPS	N/A	Not listed - excluded from DPS	Not listed - excluded from DPS	Not listed - excluded from DPS

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release		164	314,460					164	314,460		123	315,864		123	315,864
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	2.5		y			y	2.5		y	3.4		y	3.4		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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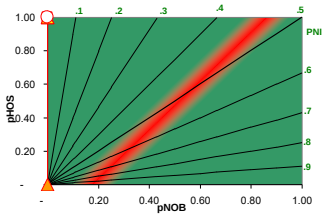
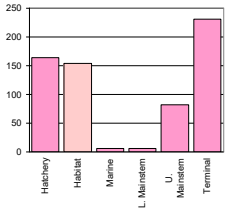
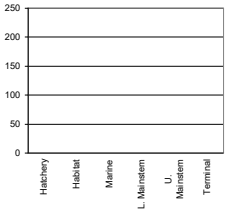
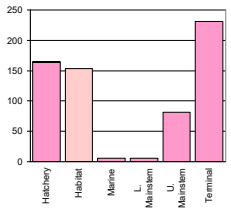
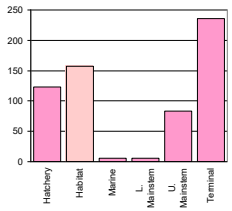
Realized Spawning Composition

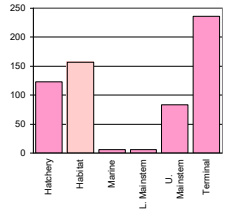












Relative Hatchery Optimum ->				80				80				80				80				80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				25%				25%				25%				25%				25%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				0.19				1.00				0.19				0.19				0.19
Average Fitness Factor (100 Generations) ->				0.24				0.99				0.24				0.24				0.24
Generations until average fitness is reached ->				43				30				43				43				43
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->		1.00		Effective pHOS ->			Effective pHOS ->		1.00		Effective pHOS ->		1.00		Effective pHOS ->		1.00	
"Fitness Floor" ->		pNOB ->				pNOB ->			pNOB ->				pNOB ->				pNOB ->			
Calculated Hatchery SAR ->		0.1%							0.1%				0.1%				0.1%			
Calculated Natural SAR ->		1.8%				1.8%			1.8%				1.8%				1.8%			
	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement		0	0	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	471	81	154				471	81	154		480	83	157		480	83	157		480	83	157

Table A21. *AHA* output for South Fork Salmon River steelhead (*B-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
13-Salmon_South Fork Summer Steelhead (B-Run)	

	Historic		Current		No Hatchery		HSRG Solution		HRT Alternatives A		HRT Alternatives B	
Population Management Intent:			Conservation		Conservation		Conservation		Conservation		Conservation	
Harv&Hatchery Strategy:			Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only	
Population Recovery Designation:			Primary		Primary		Primary		Primary		Primary	
Habitat												
Productivity (Adult) / Ad. Capacity	3.00	1,115	3.00	1,115	3.00	1,115	3.00	1,115	3.00	1,115	3.00	1,115
Min NOR Escape / % Kelt	1		1		1		1		1		1	
Smolt Productivity / Sm. Capacity	75	27,875	166	61,568	166	61,568	166	61,568	166	61,568	166	61,568
Hydro												
Ocean Surv / Baseline SAR / Vary? (Y/N)	0.092 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y
Juv Passage Surv. / Adult Passage	1.00	1.00	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
Adjusted Productivity / Adj. Capacity	1.36	505	3.00	1,115	3.00	1,115	3.00	1,115	3.00	1,115	3.00	1,115
Harvest												
Harv - Marine	NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Harv - L. Mainstem	NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Harv - U. Mainstem	NORs	HORs	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
Harv -Terminal	NORs	HORs	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
Total Exploitation Rate	NORs	HORs	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Hatchery												
Broodstock Composition	pNOB-Goal	pHOS-Goal	pNOB	pHOS 5%	pNOB	pHOS 5%	pNOB	pHOS 5%	pNOB	pHOS 5%	pNOB	pHOS 5%
	PNI	pHOS-Realized		1%				1%		1%		1%
Purpose / Type	Cons/Harv/Both	Int/Seg/Step/None	Cons	None	Cons	None	Cons	None	Cons	None	Cons	None
Broodstock by Source	Local / Imported	Smolt Release										
Brood Exported (from HOR Surplus)	Export Goal/Realized	Strays		14				14		14		14
Destination for HOR Returns	% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
Productivity of Hatchery Fish	Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.											
Update	Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
	Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
	Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
	Hatchery											

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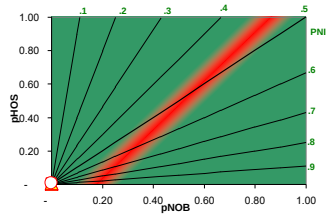
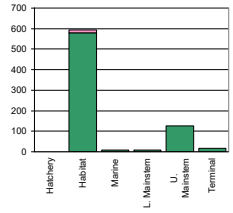
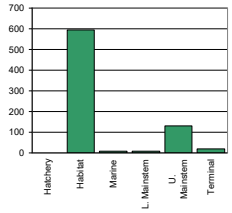
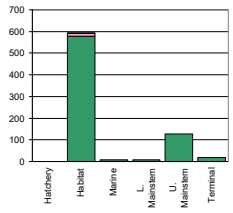
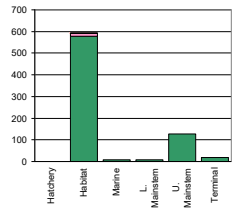
Realized Spawning Composition

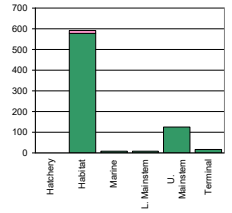












	Historic		Current		No Hatchery		HSRG Solution		HRT Alternatives A		HRT Alternatives B	
Relative Hatchery Optimum ->				80		80		80		80		80
Weir Factor ->												
Relative Reproductive Success (HOS) ->				80%		80%		80%		80%		80%
Initial Fitness Factor (A) ->				0.81		0.81		0.81		0.81		0.81
Fitness Factor after 100 generations (B) ->				0.98		1.00		0.98		0.98		0.98
Average Fitness Factor (100 Generations) ->				0.97		0.99		0.97		0.97		0.97
Generations until average fitness is reached ->				31		30		31		31		31
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.01	Effective pHOS ->		Effective pHOS ->	0.01	Effective pHOS ->	0.01	Effective pHOS ->	0.01
"Fitness Floor" ->	0.5		pNOB ->		pNOB ->		pNOB ->		pNOB ->		pNOB ->	
Calculated Hatchery SAR ->												
Calculated Natural SAR ->			1.8%		1.8%		1.8%		1.8%		1.8%	

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	2,006	267	579	2,058	275	594	2,006	267	579	2,006	267	579	2,006	267	579
HoS Total Escapement (includes strays)	43	7	14				43	7	14	43	7	14	43	7	14

Table A22. *AHA* output for Secesh River steelhead (*B-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*		Historic		Current		No Hatchery		HSRG Solution		HRT Alternatives A		HRT Alternatives B	
Salmon	Summer Steelhead	*Population Management Intent:*			Conservation		Conservation		Conservation		Conservation		Conservation	
		Harv&Hatchery Strategy:			Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only	
14-Salmon_Secesh Summer Steelhead (B-Run)		*Population Recovery Designation:*			Primary		Primary		Primary		Primary		Primary	
Habitat	Productivity (Adult)	Ad. Capacity	3.00	342	3.00	342	3.00	342	3.00	342	3.00	342	3.00	342
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	75	8,550	166	18,885	166	18,885	166	18,885	166	18,885	166	18,885
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y	0.048 / 0.018	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
	Adjusted Productivity	Adj. Capacity	1.36	155	3.00	342	3.00	342	3.00	342	3.00	342	3.00	342
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - U. Mainstem		NORs	HORs	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Harv -Terminal		NORs	HORs	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Total Exploitation Rate		NORs	HORs	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal		5%		5%		5%		5%		5%
			PNI	pHOS-Realized		1%				1%		1%		1%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Cons	None	Cons	None	Cons	None	Cons	None	Cons	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		6				6		6		6
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
			Hatchery											

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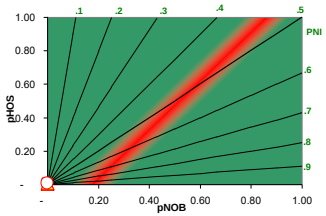
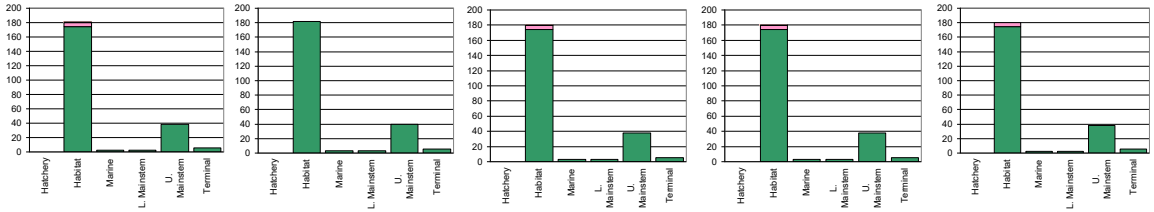
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.96	1.00	0.96	0.95	0.95
Average Fitness Factor (100 Generations) ->		0.95	0.99	0.95	0.95	0.95
Generations until average fitness is reached ->		26	30	26	26	26
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.01	Effective pHOS ->	Effective pHOS -> 0.01	Effective pHOS -> 0.01	Effective pHOS -> 0.01
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->		1.8%	1.8%	1.8%	1.8%	1.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	603	80	174	631	84	182	603	80	174	603	80	174	603	80	174
HoS Total Escapement (includes strays)	18	3	6				18	3	6	18	3	6	18	3	6

Table A23. *AHA* output for Chamberlain Creek steelhead (*A-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
15-Salmon_Chamberlain Summer Steelhead (A-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	3.00		399	3.00		399	3.00		399	3.00		399	3.00		399	3.00		399
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	75		9,975	150		19,954	150		19,954	150		19,954	150		19,954	150		19,954
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.50		199	3.00		399	3.00		399	3.00		399	3.00		399	3.00		399
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal			5%			5%			5%			5%			5%
			PNI		pHOS-Realized			0%						0%			0%			0%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		None	Cons		None	Cons		None	Cons		None	Cons		None
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			2						2			2			2
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
	Update		Hatchery																	

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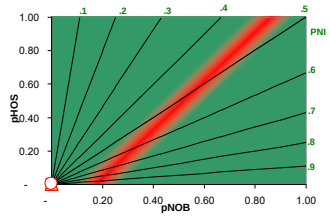
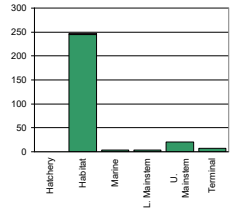
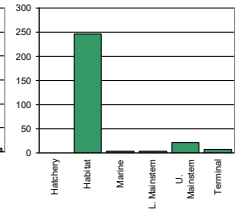
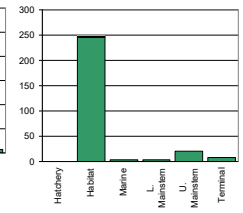
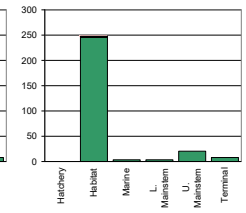
Realized Spawning Composition

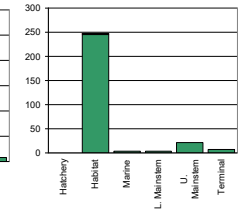












Relative Hatchery Optimum ->				80				80				80				80				80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				80%				80%				80%				80%				80%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				1.00				1.00				1.00				1.00				1.00
Average Fitness Factor (100 Generations) ->				0.99				0.99				0.99				0.99				0.99
Generations until average fitness is reached ->				32				30				32				32				32
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->		0.00		Effective pHOS ->				Effective pHOS ->		0.00		Effective pHOS ->		0.00		Effective pHOS ->		0.00
"Fitness Floor" ->	0.5	pNOB ->				pNOB ->				pNOB ->				pNOB ->				pNOB ->		
Calculated Hatchery SAR ->																				
Calculated Natural SAR ->		2.0%				2.0%				2.0%				2.0%				2.0%		
		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave
NOR Escapement		848	116	245		852	117	247		848	116	245		848	116	245		848	116	245
HoS Total Escapement (includes strays)		6	1	2						6	1	2		6	1	2		6	1	2

Table A24. *AHA* output for Lower Middle Fork Salmon River steelhead (*B-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*		Historic		Current		No Hatchery		HSRG Solution		HRT Alternatives A		HRT Alternatives B	
Salmon	Summer Steelhead	*Population Management Intent:*			Conservation		Conservation		Conservation		Conservation		Conservation	
		Harv&Hatchery Strategy:			Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only		Natural Reproduction only	
16-Salmon_Lower Middle Fork Salmon Summer Steelhead (B-Run)		*Population Recovery Designation:*			Primary		Primary		Primary		Primary		Primary	
Habitat	Productivity (Adult)	Ad. Capacity	2.50	1,587	2.50	1,587	2.50	1,587	2.50	1,587	2.50	1,587	2.50	1,587
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	63	39,675	138	87,629	138	87,629	138	87,629	138	87,629	138	87,629
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.018		0.048 / 0.018	Y	0.048 / 0.018	Y	0.048 / 0.018	Y	0.048 / 0.018	Y	0.048 / 0.018	Y
	Juv Passage Surv.	Adult Passage			0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
	Adjusted Productivity	Adj. Capacity	1.13	620	2.50	1,587	2.50	1,587	2.50	1,587	2.50	1,587	2.50	1,587
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - U. Mainstem		NORs	HORs	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Harv -Terminal		NORs	HORs	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Total Exploitation Rate		NORs	HORs	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal		5%		5%		5%		5%		5%
			PNI	pHOS-Realized		0%				0%		0%		0%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Cons	None	Cons	None	Cons	None	Cons	None	Cons	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		10				10		10		10
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
			Hatchery											

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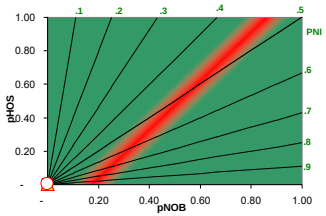
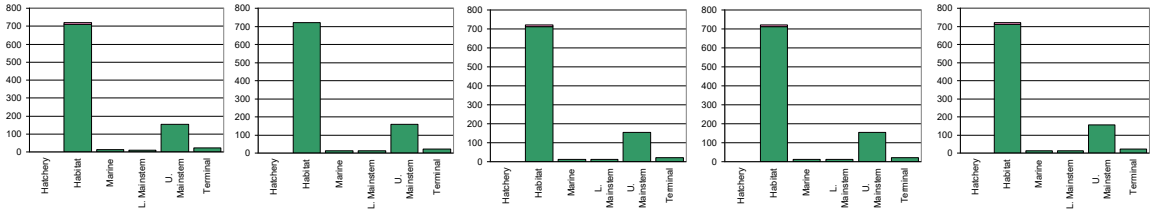
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.99	1.00	0.99	0.99	0.99
Average Fitness Factor (100 Generations) ->		0.98	0.99	0.98	0.98	0.98
Generations until average fitness is reached ->		33	30	33	33	33
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.00	Effective pHOS ->	Effective pHOS -> 0.00	Effective pHOS -> 0.00	Effective pHOS -> 0.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->		1.8%	1.8%	1.8%	1.8%	1.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	2,450	305	711	2,483	311	721	2,450	305	711	2,449	305	711	2,449	305	711
HoS Total Escapement (includes strays)	31	5	10				31	5	10	31	5	10	31	5	10

Table A25. ***AHA*** **output for Upper Middle Fork Salmon River steelhead (*B-run*).**

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
17-Salmon_Upper Middle Fork Salmon Summer Steelhead (B-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	2.50		1,667	2.50		1,667	2.50		1,667	2.50		1,667	2.50		1,667	2.50		1,667
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	63		41,675	138		92,047	138		92,047	138		92,047	138		92,047	138		92,047
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.13		755	2.50		1,667	2.50		1,667	2.50		1,667	2.50		1,667	2.50		1,667
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal			5%			5%			5%			5%			5%
			PNI		pHOS-Realized															
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		None	Cons		None	Cons		None	Cons		None	Cons		None
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
	Update		Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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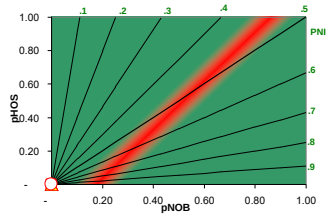
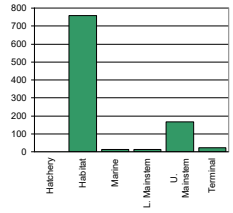
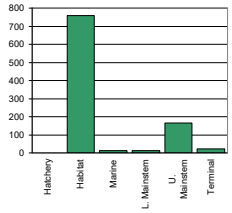
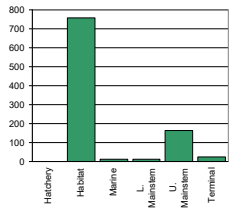
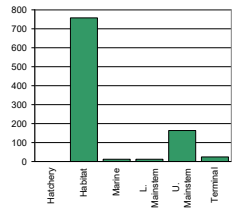
Realized Spawning Composition

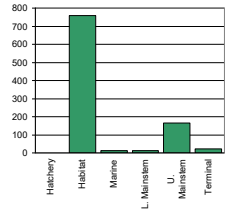












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		1.00	1.00	1.00	1.00	1.00
Average Fitness Factor (100 Generations) ->		0.99	0.99	0.99	0.99	0.99
Generations until average fitness is reached ->		30	30	30	30	30
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	Effective pHOS ->	Effective pHOS ->	Effective pHOS ->	Effective pHOS ->
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	2,608	326	758	2,608	326	758	2,608	326	758	2,608	326	758	2,608	326	758	2,608	326	758
HoS Total Escapement (includes strays)																		

Table A26. *AHA* output for Panther Creek steelhead (*A-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
18-Salmon_Panther Creek Summer Steelhead (A-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	2.00		428	2.00		428	2.00		428	2.00		428	2.00		428	2.00		428
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	50		10,700	100		21,403	100		21,403	100		21,403	100		21,403	100		21,403
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	1.00		214	2.00		428	2.00		428	2.00		428	2.00		428	2.00		428
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal			5%			5%			5%			5%			5%
			PNI		pHOS-Realized			0%						0%			0%			0%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		None	Cons		None	Cons		None	Cons		None	Cons		None
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			2						2			2			2
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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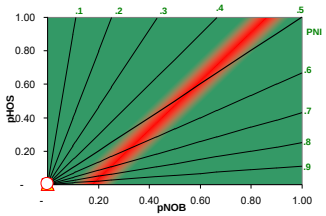
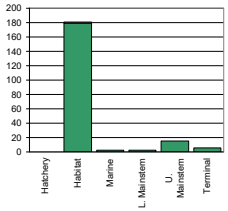
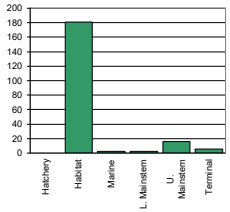
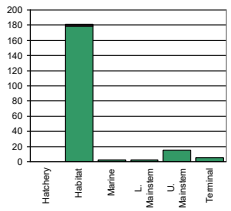
9

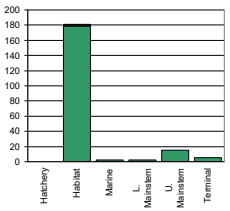
Realized Spawning Composition

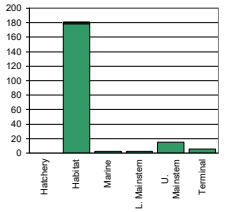












		Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.99	1.00	0.99	0.99	0.99
Average Fitness Factor (100 Generations) ->		0.99	0.99	0.99	0.99	0.99
Generations until average fitness is reached ->		33	30	33	33	33
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.00	Effective pHOS ->	Effective pHOS -> 0.00	Effective pHOS -> 0.00	Effective pHOS -> 0.00
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->		2.0%	2.0%	2.0%	2.0%	2.0%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	599	70	179	606	71	181	599	70	179	599	70	179	599	70	179
HoS Total Escapement (includes strays)	6	1	2				6	1	2	6	1	2	6	1	2

Table A27. *AHA* output for North Fork Salmon River steelhead (*A-run*).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
19-Salmon_North Fork Salmon Summer Steelhead (A-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction Only	Natural Reproducion only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary
Habitat						
Productivity (Adult) / Ad. Capacity	3.00 / 226	3.00 / 226	3.00 / 226	3.00 / 226	3.00 / 226	3.00 / 226
Min NOR Escape / % Kelt	1	1	1	1	1	1
Smolt Productivity / Sm. Capacity	75 / 5,650	150 / 11,302	150 / 11,302	150 / 11,302	150 / 11,302	150 / 11,302
Hydro						
Ocean Surv / Baseline SAR / Vary? (Y/N)	0.092 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y
Juv Passage Surv. / Adult Passage	1.00 / 1.00	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77
Adjusted Productivity / Adj. Capacity	1.50 / 113	3.00 / 226	3.00 / 226	3.00 / 226	3.00 / 226	3.00 / 226
Harvest						
Harv - Marine	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - L. Mainstem	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - U. Mainstem	NORs / HORs	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060
Harv -Terminal	NORs / HORs	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030	0.030 / 0.030
Total Exploitation Rate	NORs / HORs	0.106 / 0.106	0.106 / 0.106	0.106 / 0.106	0.106 / 0.106	0.106 / 0.106
Hatchery						
		pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS
Broodstock Composition	pNOB-Goal / pHOS-Goal	5%	5%	5%	5%	5%
	PNI / pHOS-Realized	2%		2%	2%	3%
Purpose / Type	Cons/Harv/Both / Int/Seg/Step/None	Cons / None	Cons / None	Cons / None	Cons / None	Cons / None
Broodstock by Source	Local / Imported / Smolt Release					
Brood Exported (from HOR Surplus)	Export Goal/Realized / Strays	10		10	11	12
Destination for HOR Returns	% to Hatchery / % to Nat. Spawn.	100%	100%	100%	100%	100%
Productivity of Hatchery Fish	Recruits/Spawner / Fitness? [Y / N]	y	y	y	y	y
Patterns (Update)	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.					
	Habitat ----->	Current Habitat	Current Habitat	Current Habitat	Current Habitat	Current Habitat
	Hydro ----->	Current Hydro	Current Hydro	Current Hydro	Current Hydro	Current Hydro
	Harvest --->	Current Harvest	Current Harvest	Current Harvest	Current Harvest	Current Harvest
	Hatchery					

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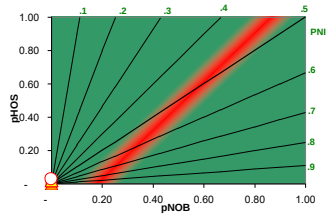
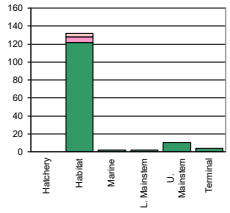
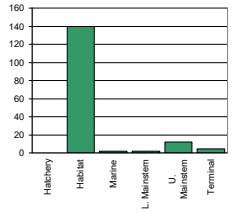
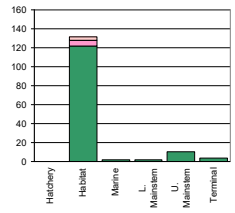
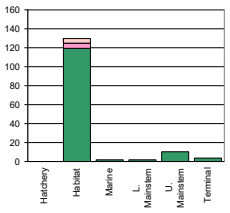
Realized Spawning Composition

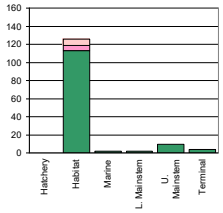












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.84	1.00	0.84	0.82	0.76
Average Fitness Factor (100 Generations) ->		0.87	0.99	0.87	0.86	0.82
Generations until average fitness is reached ->		8	30	8	6	3
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.02	Effective pHOS ->	Effective pHOS -> 0.02	Effective pHOS -> 0.02	Effective pHOS -> 0.03
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	416	55	122	482	66	140	416	55	122	406	53	119	382	50	113			
HoS Total Escapement (includes strays)	30	5	10				30	5	10	33	6	11	38	7	12			

Table A28. *AHA* output for Lemhi River steelhead (*A-run*). This population is influenced by hatchery fish from the release of *Pahsimeroi Hatchery A-run steelhead* smolts in the mainstem Salmon River, primarily at the Red Rock site (currently 120,000 smolts; see Table A29).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
20-Salmon_Lemhi Summer Steelhead (A-Run)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Harvest + Conservation	Conservation	Harvest + Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		HOR outplants at Red Rock, MS Salmon	Natural Reproduction only	HORs + weir on Lemhi River	Natural Reproducion only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	1.80		1,139	1.80		1,139	1.80		1,139	1.80		1,139	1.80		1,139	1.80		1,139
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	45		28,475	90		56,959	90		56,959	90		56,959	90		56,959	90		56,959
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.90		569	1.80		1,139	1.80		1,139	1.80		1,139	1.80		1,139	1.80		1,139
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal			5%			5%			5%			5%			5%
			PNI		pHOS-Realized			34%						6%			11%			13%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Cons		None	Cons		None
	Broodstock by Source		Local / Imported		Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			390						39			49			56
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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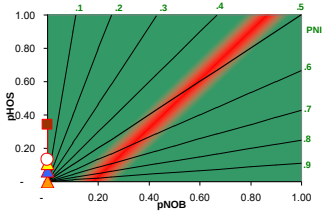
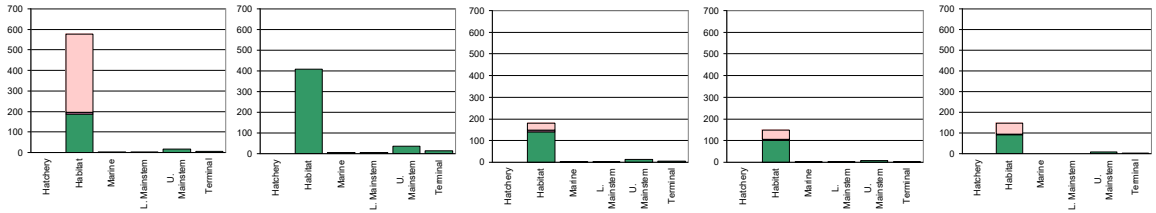
Realized Spawning Composition





Relative Hatchery Optimum ->				80				80				80				80				80
Weir Factor ->												90%								
Relative Reproductive Success (HOS) ->				80%				80%				80%				80%				80%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				0.50				1.00				0.50				0.50				0.50
Average Fitness Factor (100 Generations) ->				0.50				0.99				0.64				0.57				0.55
Generations until average fitness is reached ->				19				30				59				42				
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.34			Effective pHOS ->				Effective pHOS ->	0.06			Effective pHOS ->	0.11			Effective pHOS ->	0.13
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->				pNOB ->				pNOB ->				pNOB ->	
Calculated Hatchery SAR ->																				
Calculated Natural SAR ->				2.0%				2.0%				2.0%				2.0%				2.0%

	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement	646	63	187	1,303	147	408	644	15	142	499	16	100	474	17	91
HoS Total Escapement (includes strays)	1,191	207	390				118	20	39	149	26	49	170	29	56

Table A29. *AHA* output for *Pahsimeroi Hatchery A-run steelhead* released/outplanted in the mainstem Salmon River at Red Rock site, downstream from the mouth of the Lemhi River.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead

20A-Salmon_Lemhi Summer Steelhead (A-Run-Pahsimeroi Hatchery)

Population Management Intent:					Harvest			Conservation			Harvest			Conservation			Conservation					
Harv&Hatchery Strategy:					HOR outplants at Red Rock			Natural Reproduction only			HORs + weir on Lemhi River			Natural Reproduction only			Natural Reproduction only					
Population Recovery Designation:					Not listed; excluded from DPS			N/A			Not listed; excluded from DPS			N/A			N/A					
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B					
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0			
	Min NOR Escape	% Kelt	1			1			1			1			1			1					
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1			
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y			
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77			
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0			
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010			
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010			
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060			
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600			
	Total Exploitation Rate		NORs		HORs	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631			
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS			
	Broodstock Composition		pNOB-Goal		pHOS-Goal																		
			PNI		pHOS-Realized			100%						100%									
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Cons		None	Cons		None			
	Broodstock by Source		Local / Imported		Smolt Release		65	119,730					65	119,730									
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays																		
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%			
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	12.9		y			y	12.9		y			y			y			
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat					
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro					
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest					
			Hatchery																				

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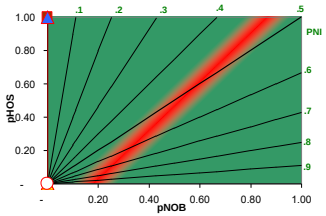
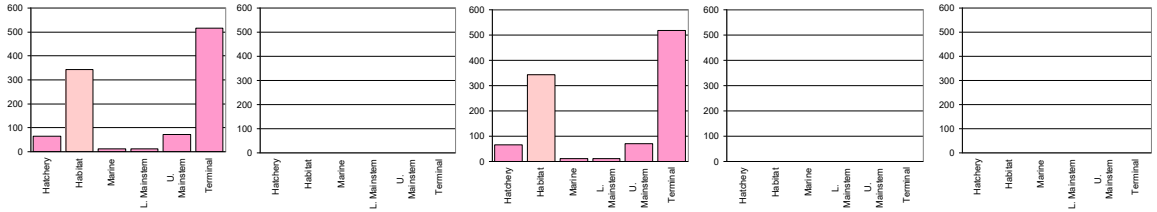
Realized Spawning Composition





Relative Hatchery Optimum ->					80					80					80					80				80
Weir Factor ->																							
Relative Reproductive Success (HOS) ->					25%					25%					25%					25%				25%
Initial Fitness Factor (A) ->					0.81					0.81					0.81					0.81				0.81
Fitness Factor after 100 generations (B) ->					0.50					1.00					0.50					1.00				1.00
Average Fitness Factor (100 Generations) ->					0.50					0.99					0.50					0.99				0.99
Generations until average fitness is reached ->					12					30					12					30				30
Minimum Hatchery Program (% of BS Goal) ->				Effective pHOS ->	1.00				Effective pHOS ->				Effective pHOS ->	1.00			Effective pHOS ->				Effective pHOS ->		
"Fitness Floor" ->	0.5			pNOB ->					pNOB ->				pNOB ->				pNOB ->				pNOB ->		
Calculated Hatchery SAR ->			0.7%									0.7%											
Calculated Natural SAR ->			2.0%					2.0%				2.0%					2.0%				2.0%		
		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave
NOR Escapement			0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
HoS Total Escapement (includes strays)		1,052	182	344						1,052	182	344											

Table A30. *AHA* output for Pahsimeroi River steelhead (*A-run*). This population is influenced primarily by the release of *Pahsimeroi Hatchery A-run steelhead* smolts at the hatchery weir on the Pahsimeroi River.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
21-Salmon_Pahsimeroi Summer Steelhead (A-Run)	

			Historic		Current		No Hatchery		HSRG Solution		HRT Alternatives A		HRT Alternatives B	
Population Management Intent:					Conservation and Harvest		Conservation		Conservation and Harvest		Conservation and Harvest		Conservation and Harvest	
Harv&Hatchery Strategy:					Segregated Hatchery		Natural Reproduction only		Segregated Hatchery		Segregated Hatchery		Segregated Hatchery	
Population Recovery Designation:					Contributing		Contributing		Contributing		Contributing		Contributing	
Habitat	Productivity (Adult)	Ad. Capacity	1.65	1,029	1.65	1,029	1.65	1,029	1.65	1,029	1.65	1,029	1.65	1,029
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	41	25,725	83	51,459	83	51,459	83	51,459	83	51,459	83	51,459
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098 / 0.020	y	0.053 / 0.020	y	0.053 / 0.020	y	0.053 / 0.020	y	0.053 / 0.020	y	0.053 / 0.020	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77	0.49	0.77
	Adjusted Productivity	Adj. Capacity	0.82	514	1.65	1,029	1.65	1,029	1.65	1,029	1.65	1,029	1.65	1,029
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - U. Mainstem		NORs	HORs	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
	Harv -Terminal		NORs	HORs	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Total Exploitation Rate		NORs	HORs	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal		10%		10%		10%		10%		10%
			PNI	pHOS-Realized		25%				25%		26%		27%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Both	None	Cons	None	Both	None	Both	None	Both	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		86				82		93		109
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		Current Harvest		Current Harvest		Current Harvest	
			Hatchery											

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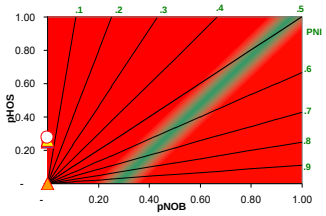
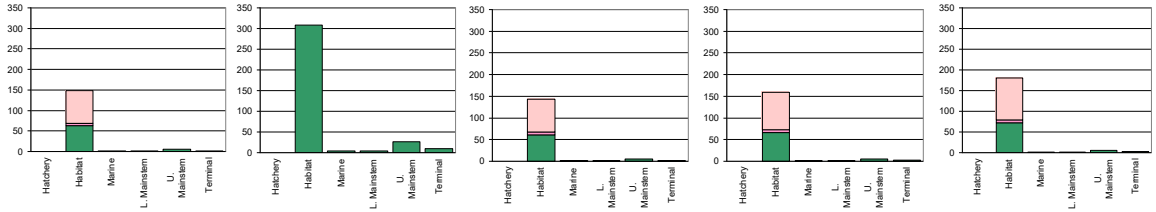
Realized Spawning Composition





Relative Hatchery Optimum ->				80				80				80				80				80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				80%				80%				80%				80%				80%
Initial Fitness Factor (A) ->				0.81				0.81				0.81				0.81				0.81
Fitness Factor after 100 generations (B) ->				0.50				1.00				0.50				0.50				0.50
Average Fitness Factor (100 Generations) ->				0.51				0.99				0.51				0.51				0.50
Generations until average fitness is reached ->				27				30				27				26				22
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	0.25			Effective pHOS ->				Effective pHOS ->	0.25			Effective pHOS ->	0.26			Effective pHOS ->	0.27	
"Fitness Floor" ->	0.5	pNOB ->				pNOB ->				pNOB ->				pNOB ->				pNOB ->		
Calculated Hatchery SAR ->																				
Calculated Natural SAR ->			2.0%				2.0%				2.0%				2.0%				2.0%	
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement			204	17	63	929	101	309	208	17	61	203	18	66	226	21	72			
HoS Total Escapement (includes strays)			262	45	86				250	44	82	285	49	93	331	58	109			

Table A31. *AHA* output for *Pahsimeroi Hatchery A-run steelhead* released into the Pahsimeroi River at the hatchery weir (currently 860,000 smolts), and into the mainstem Salmon River at Shoup Bridge (80,000 smolts) and at Colston Corner (140,000 smolts).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
21A-Salmon_Pahsimeroi Summer Steelhead (A-Run-Pahsimeroi-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Harvest	0	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery: A-run only
Population Recovery Designation:		Not listed; excluded from DPS	N/A	Not listed; excluded from DPS	Not listed; excluded from DPS	Not listed; excluded from DPS

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release	586		1,079,411				586		1,079,411	652		1,200,984	787		1,449,655
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	75%		25%			100%	75%		25%	75%		25%	75%		25%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	12.9		y			y	12.9		y	12.9		y	12.9		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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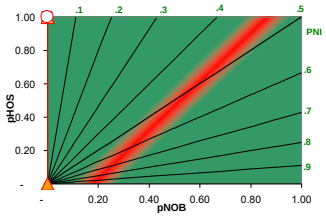
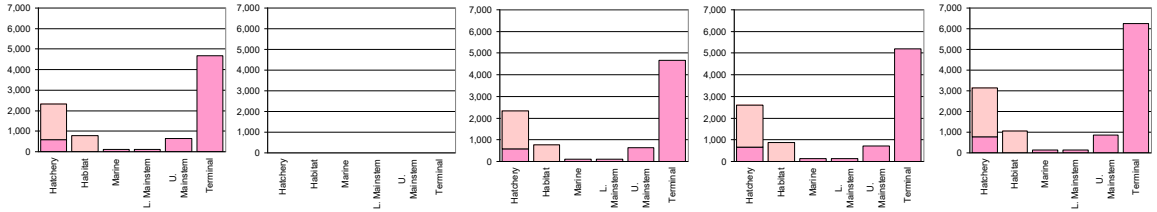
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.19	1.00	0.19	0.19	0.19
Average Fitness Factor (100 Generations) ->		0.24	0.99	0.24	0.24	0.24
Generations until average fitness is reached ->		43	30	43	43	43
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" ->		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.7%			0.7%	0.7%	0.7%
Calculated Natural SAR ->	2.0%		2.0%	2.0%	2.0%	2.0%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	2,372	412	777							2,372	412	777	2,640	458	864	3,186	553	1,043

Table A32. *AHA* output for *localized B-run summer steelhead* smolts (derived from Dworshak NFH stock) released into the Pahsimeroi River. The modeled program represents an annual release of 250,000 smolts derived from adult fish returning to the weir on the Pahsimeroi River.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
21B-Salmon_Pahsimeroi Summer Steelhead (B-Run-Pahsimeroi-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		B-run outplants elsewhere in Salmon Riv.	Natural Reproduction only	B-run program in E.F.	Segregated Hatchery	No B-run program in upper Salmon Riv.
Population Recovery Designation:		N/A	N/A	N/A	Not listed; excluded from DPS	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized												100%			
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		None	Cons		None	Harv		None	Harv		Seg	Harv		None
	Broodstock by Source		Local	Imported	Smolt Release										124		249,240			
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%	90%		10%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y	7.1		y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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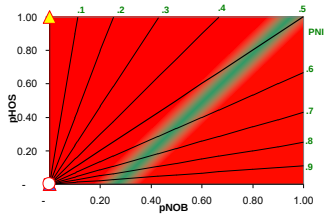
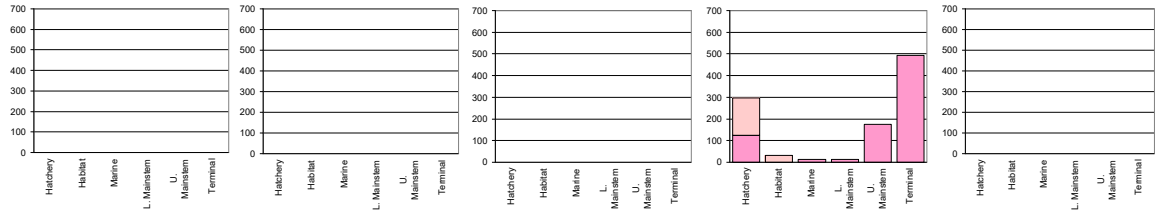
Realized Spawning Composition





	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->	80	80	80	80	80
Weir Factor ->					
Relative Reproductive Success (HOS) ->	25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	1.00	1.00	1.00	0.19	1.00
Average Fitness Factor (100 Generations) ->	0.99	0.99	0.99	0.24	0.99
Generations until average fitness is reached ->	30	30	30	43	30
Minimum Hatchery Program (% of BS Goal) ->				1.00	
"Fitness Floor" ->	Effective pHOS -> / pNOB ->	Effective pHOS -> / pNOB ->	Effective pHOS -> / pNOB ->	Effective pHOS -> / pNOB ->	Effective pHOS -> / pNOB ->
Calculated Hatchery SAR ->				0.4%	
Calculated Natural SAR ->	1.8%	1.8%	1.8%	1.8%	1.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)										100	17	32			

Table A33. *AHA* output for (a) *A-run* hatchery-origin steelhead released in the Salmon River at McNabb Point (120,000 smolts) and Tunnel Rock (60,000 smolts) under *Current*, and (b) *East Fork Salmon River F2 HOR Naturals* released at the two preceding locations (120,000 and 60,000 smolts, respectively) and at RM 1.0 in the lower E.F. Salmon River (325,000 smolts) under the *HSRG Solution* and *HRT Alternatives*.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
22C-Salmon_East Fork Salmon Summer Steelhead (A-Run Pahsimeroi-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:	Harvest	Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Pahsimeroi Hatchery stock	Natural Reproduction only	E.F. Salmon River stock	E.F. Salmon River stock	E.F. Salmon River stock
Population Recovery Designation:		Not listed; excluded from DPS	N/A	Sustaining	Sustaining	Sustaining

		Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Habitat	Productivity (Adult) / Ad. Capacity	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0
	Min NOR Escape / % Kelt	1	1	1	1	1	1
	Smolt Productivity / Sm. Capacity	0 / 0	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
Hydro	Ocean Surv / Baseline SAR / Vary? (Y/N)	0.092 / 0.018 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y	0.053 / 0.020 / y
	Juv Passage Surv. / Adult Passage	1.00 / 1.00	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77	0.49 / 0.77
	Adjusted Productivity / Adj. Capacity	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0	0.00 / 0
Harvest	Harv - Marine	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
	Harv - L. Mainstem	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
	Harv - U. Mainstem	NORs / HORs	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060	0.060 / 0.060
	Harv -Terminal	NORs / HORs	0.030 / 0.600	0.030 / 0.600	0.030 / 0.600	0.030 / 0.600	0.030 / 0.600
	Total Exploitation Rate	NORs / HORs	0.106 / 0.631	0.106 / 0.631	0.106 / 0.631	0.106 / 0.631	0.106 / 0.631
Hatchery			pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS
	Broodstock Composition	pNOB-Goal / pHOS-Goal					
		PNI / pHOS-Realized	100%		100%	100%	100%
	Purpose / Type	Cons/Harv/Both / Int/Seg/Step/None	Harv / Seg	Harv / Seg	Harv / Seg	Harv / Seg	Harv / Seg
	Broodstock by Source	Local / Imported / Smolt Release	98 / 180,516		86 / 180,600	80 / 160 / 504,000	80 / 160 / 504,000
	Brood Exported (from HOR Surplus)	Export Goal/Realized / Strays					
	Destination for HOR Returns	% to Hatchery / % to Nat. Spawn.	100%	100%	100%	20% / 80%	50% / 50%
	Productivity of Hatchery Fish	Recruits/Spawner / Fitness? [Y / N]	12.9 / y	y	7.1 / y	7.1 / y	7.1 / y
Patterns (Update)	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.	Habitat ----->; Hydro ----->; Harvest ---->; Hatchery	Current Habitat; Current Hydro; Current Harvest	Current Habitat; Current Hydro; Current Harvest	Current Habitat; Current Hydro; Current Harvest	Current Habitat; Current Hydro; Current Harvest	Current Habitat; Current Hydro; Current Harvest

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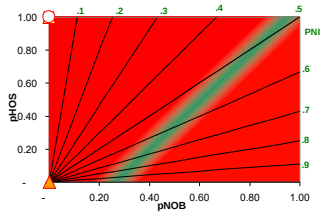
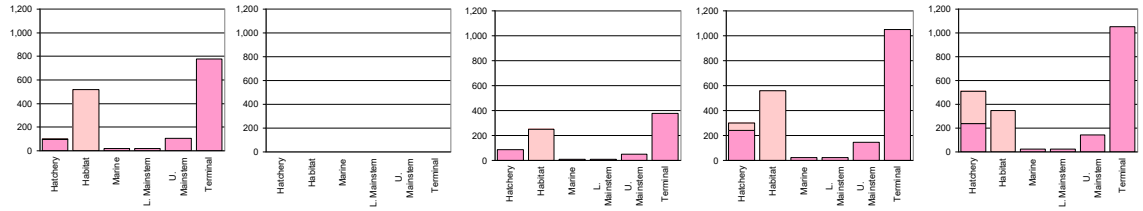
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.19	1.00	0.19	0.19	0.19
Average Fitness Factor (100 Generations) ->		0.24	0.99	0.24	0.24	0.24
Generations until average fitness is reached ->		43	30	43	43	43
Minimum Hatchery Program (% of BS Goal) ->	Effective pHOS ->	1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" ->	pNOB ->		pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.7%			0.3%	0.3%	0.3%
Calculated Natural SAR ->	2.0%		2.0%	2.0%	2.0%	2.0%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	1,587	275	519				766	133	251	1,711	297	560	1,069	185	350

Table A34. *AHA* output for East Fork Salmon River steelhead (*A/B-run*). The *HSRG solution* and *HRT Alternative B* assume construction of a new weir at RM 1.0 in the East Fork Salmon River. *HRT Alternative A* assumes releases are moved upstream of the current weir at RM 18.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Salmon	Summer Steelhead
22-Salmon_East Fork Salmon Summer Steelhead	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Conservation	Conservation	Conservation + Harvest	Conservation + Harvest	Conservation + Harvest
Harv&Hatchery Strategy:		Integrated Hatchery	Natural reproduction only	Stepping Stone Hatchery Program	Stepping Stone Hatchery Program	Stepping Stone Hatchery Program
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	1.50		1,048	1.50		1,048	1.50		1,048	1.50		1,048	1.50		1,048	1.50		1,048
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	38		26,200	75		52,408	75		52,408	75		52,408	75		52,408	75		52,408
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.75		524	1.50		1,048	1.50		1,048	1.50		1,048	1.50		1,048	1.50		1,048
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182	0.182		0.182
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal	50%		30%			30%	75%		30%	75%		30%	75%		30%
			PNI		pHOS-Realized	0.53		44%				0.66		39%	0.59		53%	0.60		51%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Cons		Int	None		None	Cons		Int	Cons		Int	Cons		Int
	Broodstock by Source		Local / Imported		Smolt Release	29		60,900				48		100,800	72		151,200	72		151,200
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			559				86	86	269	160	160	466	160	160	295
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	20%		80%			100%	75%		25%	50%		50%	50%		50%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	4.0		y			y	7.1		y	7.1		y	7.1		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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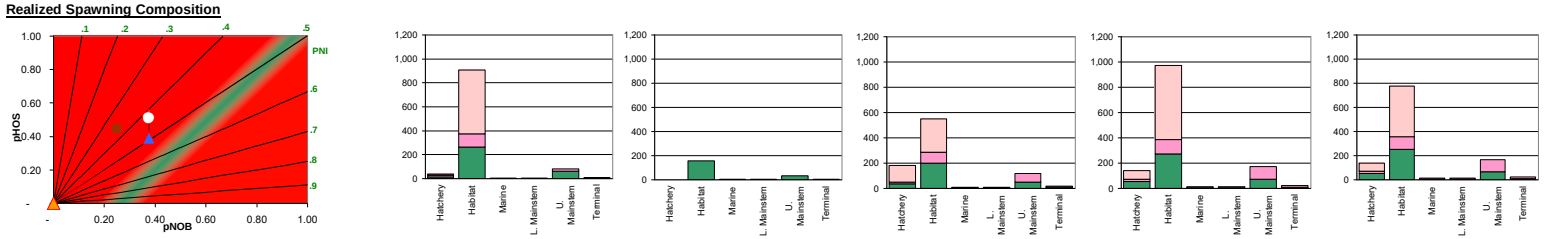

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.67	1.00	0.79	0.73	0.73
Average Fitness Factor (100 Generations) ->		0.70	0.99	0.80	0.74	0.75
Generations until average fitness is reached ->		38	30	9	29	28
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.44	Effective pHOS ->	Effective pHOS -> 0.39	Effective pHOS -> 0.53	Effective pHOS -> 0.51
"Fitness Floor" -> 0.5		pNOB -> 0.25	pNOB ->	pNOB -> 0.38	pNOB -> 0.38	pNOB -> 0.38
Calculated Hatchery SAR ->		0.2%		0.3%	0.3%	0.3%
Calculated Natural SAR ->		2.0%	2.0%	2.0%	2.0%	2.0%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement	969	88	262	407	35	155	789	42	202	1,138	69	272	1,056	56	250
HoS Total Escapement (includes strays)	1,965	340	643				1,058	184	346	2,135	370	699	1,613	279	528

Table A35. ***AHA*** **output for (a)** ***Dworshak NFH B-run steelhead*** **outplanted into East Fork Salmon River (*Current*) and (b) a** ***localized B-run*** **hatchery steelhead population (derived from Dworshak NFH fish) after construction of a new weir in the lower East Fork (*HSRG Solution*).**

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*	*Population Management Intent:*	Harvest	Conservation	Harvest	Harvest	Harvest
Salmon	Summer Steelhead	*Harv&Hatchery Strategy:*	Outplants from Dworshak NFH	Natural Reproduction only	ocalized B-run stock with new wei	calized B-run stock at Pahsimeroi	o B-run hatchery program in upper Snake Riv
22B-Salmon_East Fork Salmon Summer Steelhead (B-Run Dworshak-Hatchery)		*Population Recovery Designation:*	N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%						
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Harv		Seg	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release		170	325,965				162		325,620						
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays							134	134							
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%	90%		10%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	2.5		y			y	7.1		y	7.1		y	7.1		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

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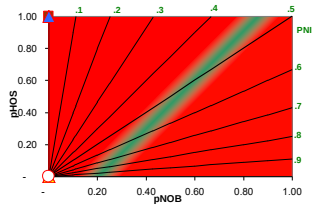
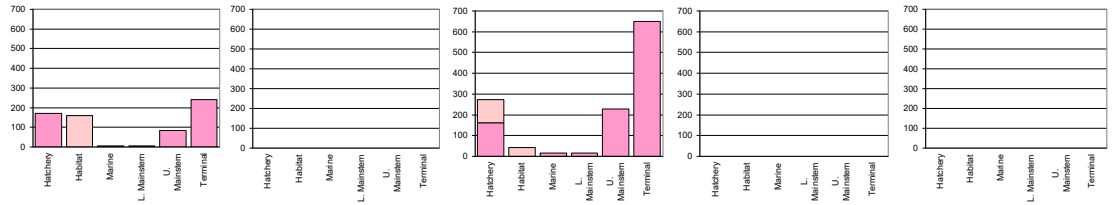
Realized Spawning Composition





Relative Hatchery Optimum ->				80					80					80				80		80
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				25%					25%					25%				25%		25%
Initial Fitness Factor (A) ->				0.81					0.81					0.81				0.81		0.81
Fitness Factor after 100 generations (B) ->				0.50					1.00					0.50				1.00		1.00
Average Fitness Factor (100 Generations) ->				0.50					0.99					0.50				0.99		0.99
Generations until average fitness is reached ->				12					30					12				30		30
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->		1.00		Effective pHOS ->				Effective pHOS ->			Effective pHOS ->	1.00		Effective pHOS ->			Effective pHOS ->	
"Fitness Floor" ->	0.5	pNOB ->				pNOB ->				pNOB ->			pNOB ->			pNOB ->			pNOB ->	
Calculated Hatchery SAR ->		0.1%								0.4%			0.4%			0.4%			0.4%	
Calculated Natural SAR ->		1.8%				1.8%				1.8%			1.8%			1.8%			1.8%	
		Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	
NOR Escapement			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HoS Total Escapement (includes strays)		488	84	159				132	22	43										

Table A36. *AHA* output for *localized B-run* hatchery steelhead released into Squaw Creek. The *HSRG Solution* imports *localized B-run* steelhead annually from a new *B-run* hatchery population propagated from adults that return to the East Fork Salmon River.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

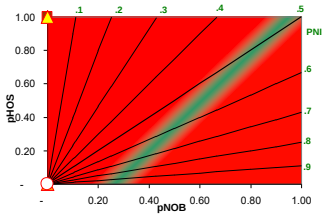
Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
23C-Salmon_Upper Salmon Summer Steelhead (Upper Salmon B-Run Program)	

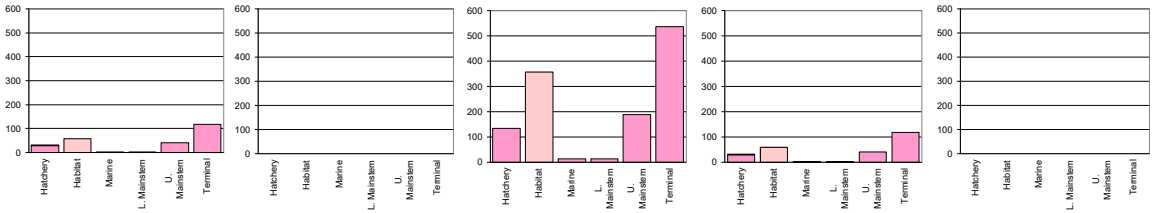
	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Local Segregated Broodstock	Natural Reproduction only	Local broodstock at E.F. Salmon R.	Local Broodstock at Pahsimeroi FH	No B-run program in upper Salmon River
Population Recovery Designation:		Not listed; excluded from DPS	N/A	Not listed; excluded from DPS	Not listed; excluded from DPS	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		None
	Broodstock by Source		Local / Imported		Smolt Release	30		59,153					134	269,340	30		59,153			
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	25%		75%			100%			100%	25%		75%	25%		75%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	7.1		y			y	7.1		y	7.1		y	7.1		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

793
22

Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.19	1.00	0.19	0.19	1.00
Average Fitness Factor (100 Generations) ->		0.24	0.99	0.24	0.24	0.99
Generations until average fitness is reached ->		43	30	43	43	30
Minimum Hatchery Program (% of BS Goal) ->	Effective pHOS ->	1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS ->
"Fitness Floor" ->	pNOB ->		pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->	0.4%			0.4%	0.4%	0.4%
Calculated Natural SAR ->	1.8%		1.8%	1.8%	1.8%	1.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	183	29	59				1,092	189	357	183	29	59						

Table A37. *AHA* output for *Dworshak NFH B-run steelhead* outplanted into Squaw Creek. The *HSRG Solution* and *HRT Alternative A* would terminate these outplants (as would *HRT Alternative B*) and develop a localized hatchery population at the upper Salmon River basin.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
23B-Salmon_Upper Salmon Summer Steelhead (B-Run Dworshak-Hatchery)	

Population Management Intent:						Harvest			Conservation			Harvest			Harvest			Harvest					
Harv&Hatchery Strategy:						Outplanting from Dworshak NFH			Natural Reproduction only			Local broodstock at E.F. Salmon R			Local Broodstock at Pahsimeroi FH			B-run steelhead program in upper Salmon Rh					
Population Recovery Designation:						N/A			N/A			N/A			N/A			N/A					
				Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B				
Habitat	Productivity (Adult)		Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0		
	Min NOR Escape		% Kelt	1			1			1			1			1			1				
	Smolt Productivity		Sm. Capacity	0		0	1		1	1		1	1		1	1		1	1		1		
Hydro	Ocean Surv	Baseline SAR	Vary? (Y/N)	0.092	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y	0.048	0.018	y		
	Juv Passage Surv.		Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77		
	Adjusted Productivity		Adj. Capacity	0.00		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0		
Harvest	Harv - Marine			NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010		
	Harv - L. Mainstem			NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010		
	Harv - U. Mainstem			NORs		HORs	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140	0.140		0.140		
	Harv -Terminal			NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600		
	Total Exploitation Rate			NORs		HORs	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663	0.182		0.663		
Hatchery							pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS		
	Broodstock Composition			pNOB-Goal		pHOS-Goal																	
				PNI		pHOS-Realized			100%														
	Purpose	Type		Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		None	Harv		None	Harv		None		
	Broodstock by Source			Local	Imported	Smolt Release		130	249,267														
	Brood Exported (from HOR Surplus)			Export Goal/Realized		Strays																	
	Destination for HOR Returns			% to Hatchery		% to Nat. Spawn.	25%		75%			100%			100%			100%			100%		
	Productivity of Hatchery Fish			Recruits/Spawner		Fitness? [Y / N]	2.5		y			y	2.5		y	2.5		y	2.5		y		
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.			Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat				
				Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro				
				Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest				
Update				Hatchery																			

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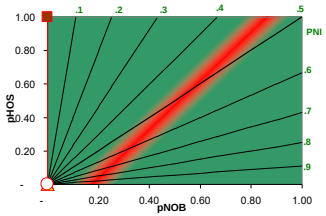
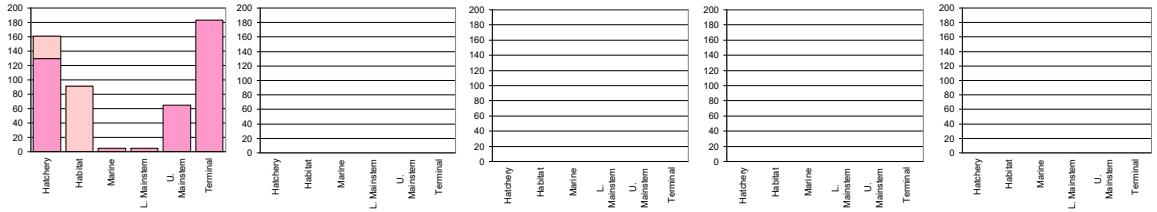
Realized Spawning Composition





Relative Hatchery Optimum ->						80						80						80				80	
Weir Factor ->																							
Relative Reproductive Success (HOS) ->						25%						25%						25%				25%	
Initial Fitness Factor (A) ->						0.81						0.81						0.81				0.81	
Fitness Factor after 100 generations (B) ->						0.19						1.00						1.00				1.00	
Average Fitness Factor (100 Generations) ->						0.24						0.99						0.99				0.99	
Generations until average fitness is reached ->						43						30						30				30	
Minimum Hatchery Program (% of BS Goal) ->				Effective pHOS ->		1.00			Effective pHOS ->						Effective pHOS ->						Effective pHOS ->		
"Fitness Floor" ->				pNOB ->					pNOB ->						pNOB ->						pNOB ->		
Calculated Hatchery SAR ->				0.1%									0.1%			0.1%					0.1%		
Calculated Natural SAR ->				1.8%					1.8%				1.8%			1.8%					1.8%		
				Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave		
NOR Escapement					0	0		0	0	0	0	0		0	0	0	0	0		0	0		
HoS Total Escapement (includes strays)				280	48	91																	

Table A38. *AHA* output for upper Salmon River steelhead (*A-run*) including Yankee Fork, Valley Creek, Slate Creek, and Squaw Creek.

All H Analyzer (AHA)

Apply & Recalculate

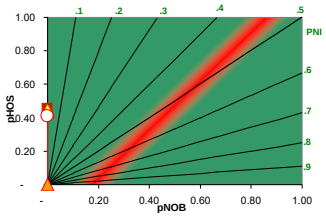
Population (Ctrl + Page Up/Down to Scroll)

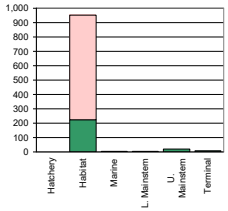
Subregion/Subbasin	*Species/Race*	*Population Management Intent:*	Harvest and Conservation	Conservation	Harvest and Conservation	Harvest and Conservation	Harvest and Conservation
Salmon	Summer Steelhead	*Harv&Hatchery Strategy:*	Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
23-Salmon_Upper Salmon Summer Steelhead (A-Run)		*Population Recovery Designation:*	Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing

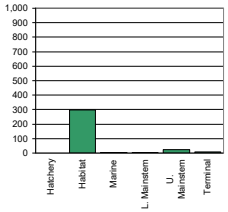
			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	1.50		1,283	1.50		1,283	1.50		1,283	1.50		1,283	1.50		1,283	1.50		1,283
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	38		32,075	75		64,168	75		64,168	75		64,168	75		64,168	75		64,168
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.75		641	1.50		1,283	1.50		1,283	1.50		1,283	1.50		1,283	1.50		1,283
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030	0.030		0.030
	Total Exploitation Rate		NORs		HORs	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106	0.106		0.106
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			45%						44%			45%			41%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Seg	Cons		None	Both		Seg	Both		Seg	Both		Seg
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			727						648			699			442
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
			Hatchery																	

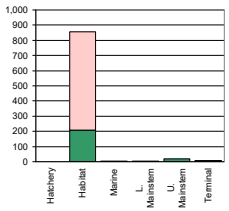
540
19

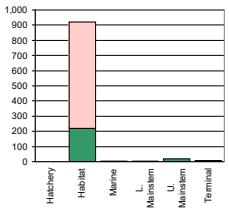
Realized Spawning Composition

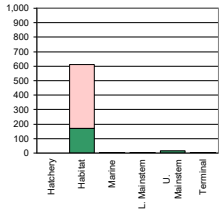












Relative Hatchery Optimum ->				80					80					80				80		
Weir Factor ->									25%					25%						
Relative Reproductive Success (HOS) ->				80%					80%					80%				80%		
Initial Fitness Factor (A) ->				0.81					0.81					0.81				0.81		
Fitness Factor after 100 generations (B) ->				0.50					1.00					0.50				0.50		
Average Fitness Factor (100 Generations) ->				0.50					0.99					0.50				0.50		
Generations until average fitness is reached ->				17					30					17				18		
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->	0.45			Effective pHOS ->				Effective pHOS ->	0.44			Effective pHOS ->	0.45			Effective pHOS ->	0.41
"Fitness Floor" ->	0.5		pNOB ->				pNOB ->				pNOB ->				pNOB ->				pNOB ->	
Calculated Hatchery SAR ->																				
Calculated Natural SAR ->			2.0%				2.0%				2.0%				2.0%				2.0%	
			Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave		Max	Min	Ave
NOR Escapement			802	77	223		821	84	297		744	71	208		794	76	221		592	55	170
HoS Total Escapement (includes strays)			2,221	386	727						1,980	344	648		2,136	371	699		1,350	234	442

Table A39. *AHA* output for *Sawtooth Hatchery A-run steelhead* released into the upper Salmon River at the Sawtooth FH weir (currently 810,000 smolts), Yankee Fork (330,000 smolts), Slate Creek (90,000 smolts), and Valley Creek (50,000 smolts).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Salmon	Summer Steelhead
23A-Salmon_Upper Salmon Summer Steelhead (A-Run Sawtooth-Pahsimeroi-Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Population Management Intent:		Harvest and Conservation	Conservation	Harvest and Conservation	Harvest and Conservation	Harvest and Conservation
Harv&Hatchery Strategy:		Sawtooth/Pahsimeroi Hatchery stocks	Natural Reproduction only	awtooth/Pahsimeroi Hatchery stoc	Sawtooth Hatchery stock only	Sawtooth Hatchery stock only
Population Recovery Designation:		Not listed; excluded from DPS	N/A	Not listed; excluded from DPS	Not listed; excluded from DPS	Not listed; excluded from DPS

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternatives A			HRT Alternatives B		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y	0.053	0.020	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77	0.49		0.77
	Adjusted Productivity	Adj. Capacity	0.00		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - U. Mainstem		NORs		HORs	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060	0.060		0.060
	Harv -Terminal		NORs		HORs	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600	0.030		0.600
	Total Exploitation Rate		NORs		HORs	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631	0.106		0.631
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release	695		1,280,191				695		1,280,191	760		1,399,920	760		1,399,920
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	70%		30%			100%	70%		30%	70%		30%	80%		20%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	12.9		y			y	12.9		y	12.9		y	12.9		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			Current Harvest			Current Harvest			Current Harvest		
	Update		Hatchery																	

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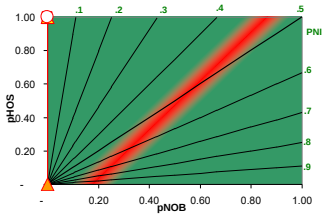
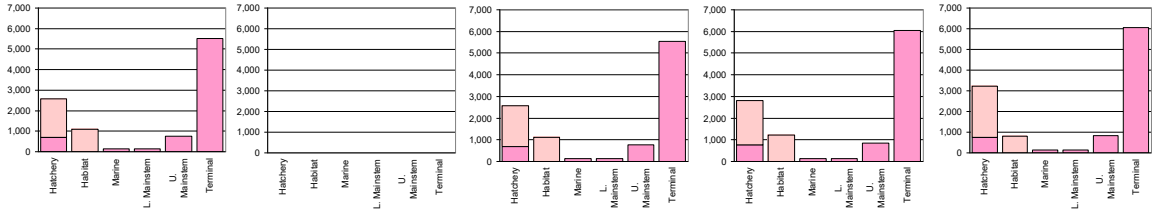
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternatives A	HRT Alternatives B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		25%	25%	25%	25%	25%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 1.00	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->		0.7%		0.7%	0.7%	0.7%
Calculated Natural SAR ->		2.0%	2.0%	2.0%	2.0%	2.0%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternatives A Max	HRT Alternatives A Min	HRT Alternatives A Ave	HRT Alternatives B Max	HRT Alternatives B Min	HRT Alternatives B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	3,375	586	1,105				3,375	586	1,105	3,691	641	1,209	2,460	427	806

Table A40-A45: *AHA* outputs for the South Fork Salmon River Major Population Group (MPG) of spring/summer Chinook salmon

Parameters and assumptions for spring/summer Chinook in the South Fork Salmon River

The South Fork Salmon River MPG for spring/summer Chinook includes the Little Salmon River and Rapid River watersheds, the South Fork Salmon River and tributaries, and the intervening section of the mainstem Salmon River. Hatchery programs currently operate on Rapid River (*Rapid River Hatchery Spring Chinook*), the South Fork Salmon River, and Johnson Creek, a tributary to the East Fork of the South Fork Salmon River.

Table 7A. Mean values of reproductive and survival parameters assumed in the AHA analyses for hatchery-origin spring/summer Chinook released within the South Fork Salmon River MPG. Parameter values were obtained from the HSRG as provided by IDFG.

Hatchery/ Release location *Population/Stock*	**Fecundity (No. of eggs)**	**Within-hatchery egg-to-smolt survival**	**Salmon River smolt-to-adult survival (%)**	**Recruit/spawner (R/S; adults)**
Rapid River FH *Rapid River Hatchery Spring Chinook*	4,100	0.85	0.47%	6.0
McCall Hatchery/ South Fork Salmon River *South Fork Salmon River Summer Chinook*	4,300	0.80	0.73%	6.0
McCall Hatchery/ Johnson Creek *Johnson Creek Summer Chinook*	4,300	0.85	0.45%	6.0

Current programs, HSRG solutions, and HRT alternatives

Of the three principal hatchery programs conducted within the South Fork Salmon River MPG, the HRT reviewed only the South Fork Salmon River summer Chinook program that operates under the LSRCP. AHA analyses for *Rapid River Hatchery Spring Chinook* and *Johnson Creek Summer Chinook* represent those reported by the HSRG. The HRT specifically modeled *HRT Alternatives 2, 4*, and *5* for the South Fork Salmon River Summer Chinook program.

Alternative 2 represents an integrated hatchery program where the current program would be transitioned from the current segregated program (1.0M smolts, $PNI = 0$) to an integrated program that would include natural-origin fish in the broodstock ($pNOB = 50\%$) to achieve a value of $PNI \geq 0.5$. The HRT assumed that the current location of the weir is capable of trapping only 50% of returning hatchery-origin adults relative to the total available spawning habitat available in the South Fork Salmon River (i.e., Poverty Flats downstream of the weir and Stolle Meadows upstream of the weir). Based on the productivity and capacity parameters of the Beverton-Holt curve ($r = R/S_{max} = 3.0$ and C = max. number of adult recruits = 2,140 adults), the HRT's analysis indicates that the South Fork Salmon River could support an integrated hatchery program with a maximum release of 490,000

hatchery-origin smolts for the entire S.F. population to maintain PNI > 0.5, a reduction of approximately 50% from the current program. The program would include (a) the trapping and spawning of approximately 500 adults for producing 490,000 smolts and (b) the spawning of approximately 300 additional adults (n=294 "exported" adults assuming a 2:1 male:female sex ratio) to yield 300,000 eyed eggs for the Dollar Creek egg-box program of the Shoshone-Bannock Tribes.

Alternative 4 represents a "stepping-stone" hatchery program composed of two broodstocks each year. The first broodstock would be integrated with the natural population that spawns in Stolle Meadows upstream of the weir. Smolt offspring of this first broodstock would be tagged but not marked (no adipose fin clip) at the time of release. The second broodstock would use hatchery-origin adults from the first broodstock to produce *F2* hatchery-origin fish for harvest. The AHA analyses suggest that the first integrated broodstock could yield 175,000 smolts with *pNOB* = 0.5 . The second broodstock would yield 825,000 smolts that would be marked with an adipose fin clip. Adult returns from this second broodstock would be sufficient to provide 300,000 eyed eggs (approximately 200 adults, assuming a 1:1 sex ratio) for the Dollar Creek egg box program. The HRT assumed that the current weir is capable of trapping 90% of all hatchery-origin adults intercepted at the weir relative to the naturally spawning population upstream of the weir. *Alternative 4* is the HRT's "preferred alternative".

Alternative 5 is similar to *Alternative 4* except the first broodstock of the stepping stone program would be integrated relative to the entire naturally spawning population in the South Fork (i.e., Stolle Meadows and Poverty Flat). *HRT Alternative 5* and the *HSRG Solution* are similar except (a) the HSRG assumed a female fecundity of 4,700 eggs compared to the assumption of 4,300 eggs by the HRT, (b) the HSRG assumed that the current weir could trap 95% of returning hatchery-origin adults, whereas the HRT assumed only 50% of returning adults could be trapped relative to the entire S.F. Salmon River (i.e., 50% of the adults spawn downstream of the current weir), and (c) the HSRG was able to achieve desired values of *PNI* with *pNOB* = 30%, whereas the HRT analysis indicates a required value of *pNOB* = 67% because of the large numbers of hatchery-origin fish that would be expected to spawn downstream of the weir, thus inflating the expected value of *pHOS*. These latter analyses yield a release of 250,000 unmarked (but tagged) smolts from the first "integrated" broodstock and 750,000 marked smolts from the second "production" broodstock.

Table 8A. Summary of the number of hatchery-origin (HOR) spring/summer Chinook smolts released into the geographic area of the South Fork Salmon River Major Population Group (MPG) under four strategies modeled in *AHA* Tables A40-A45: (1) *Current* programs based on the LSRCP Cooperators 2008 Annual Operating Plan for the Salmon River, (2) *HRT Alternative 5* which is similar to the *HSRG Solution*, (3) *HRT Alternative 1* (current programs with implementation of HRT recommendations), and (4) *HRT Alternative 4,* which is the HRT's "preferred alternative". The names of hatchery stocks/populations are in italics (e.g., "*Rapid River*") and are identified by the facility/location where adults are trapped for broodstock.

Release location (Hatchery)	Current	S.F. Salmon River HRT Alternative 5 (HSRG Solution)	S.F. Salmon River, HRT Alternative 2	S.F. Salmon River, HRT Alternative 4
Rapid River (Rapid River FH) *(AHA Tables A40, A41)*	• 2.7M *Rapid River Hatchery* smolts	No recommendation (same as Current)	No recommendation (same as Current)	No recommendation (same as Current)
S.F. Salmon River (McCall FH) *(AHA Tables A42, A43; see also AHA Table A44)*	• 1.0M *SF Salmon River* smolts (*pNOB* = 0) • 300K *SF Salmon River* eyed eggs to Shoshone-Bannock Tribes for egg box program	• 250K *SF Salmon River* smolts (*pNOB* = 0.67) • 750K *SF Salmon River F2* smolts (*pNOB* = 0) • 300K *SF Salmon River F2* eyed eggs to Shoshone-Bannock Tribes for egg box program	• 490K *S.F. Salmon River* smolts (*pNOB* = 0.5) • 300K *SF Salmon River* eyed eggs to Shoshone-Bannock Tribes for egg box program	• 175K *SF Salmon River* smolts (*pNOB* = 0.5) • 825K *SF Salmon River F2* smolts (*pNOB* = 0) • 300K *SF Salmon River F2* eyed eggs to Shoshone-Bannock Tribes for egg box program
Johnson Creek (McCall FH) *(AHA Table A45)*	• 100K *Johnson Cr.* smolts	No recommendation (same as Current)	No recommendation (same as Current)	No recommendation (same as Current)

Table A40: *AHA* output for spring/summer Chinook in the Little Salmon River. *Rapid River Hatchery Spring Chinook* are modeled in Table A41. HRT Alternatives refer to the South Fork Salmon River summer Chinook program.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
S.F. Salmon R	Spring Chinook
10-Salmon_Little Salmon Spring-Summer Chinook	

	Historic	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
Population Recovery Designation:		Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing
Habitat						
Productivity (Adult) / Ad. Capacity	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250
Min NOR Escape / % Kelt	1	1	1	1	1	1
Smolt Productivity / Sm. Capacity	33 / 31,250	161 / 154,603	161 / 154,603	161 / 154,603	161 / 154,603	161 / 154,603
Hydro						
Ocean Surv / Baseline SAR / Vary? (Y/N)	0.098 / 0.040 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y
Juv Passage Surv. / Adult Passage	1.00 / 1.00	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82
Adjusted Productivity / Adj. Capacity	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250	1.30 / 1,250
Harvest						
Harv - Marine	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - L. Mainstem	NORs / HORs	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080
Harv - U. Mainstem	NORs / HORs	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080
Harv -Terminal	NORs / HORs	0.080 / 0.500	0.080 / 0.500	0.080 / 0.500	0.080 / 0.500	0.080 / 0.500
Total Exploitation Rate	NORs / HORs	0.152 / 0.581	0.152 / 0.581	0.152 / 0.581	0.152 / 0.581	0.152 / 0.581
Hatchery						
Broodstock Composition	pNOB-Goal / pHOS-Goal	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS
	PNI / pHOS-Realized	59%		59%	59%	59%
Purpose / Type	Cons/Harv/Both / Int/Seg/Step/None	Harv / None	Cons / None	Harv / None	Harv / None	Harv / None
Broodstock by Source	Local / Imported / Smolt Release					
Brood Exported (from HOR Surplus)	Export Goal/Realized / Strays	484		477	474	466
Destination for HOR Returns	% to Hatchery / % to Nat. Spawn.	100%	100%	100%	100%	100%
Productivity of Hatchery Fish	Recruits/Spawner / Fitness? [Y / N]	y	y	y	y	y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.					
Update	Habitat ----->	Current Habitat	Current Habitat	Current Habitat	Current Habitat	HRT Alt-B
	Hydro ----->	Current Hydro	Current Hydro	Current Hydro	Current Hydro	Current Hydro
	Harvest --->	Current Harvest	Current Harvest	HSRG Harvest	Current Harvest	HSRG Harvest
	Hatchery					

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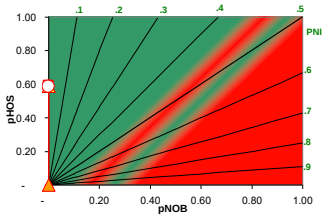
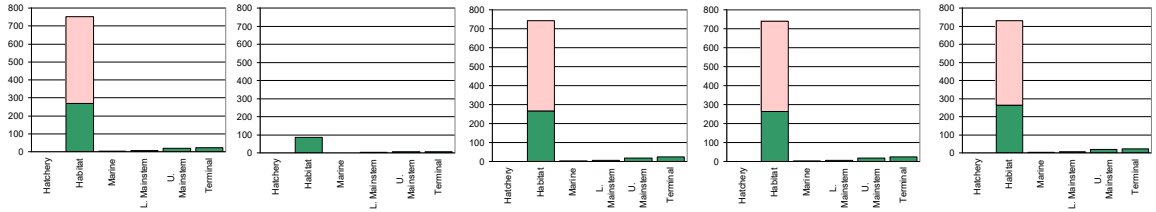
Realized Spawning Composition





	Historic	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		15	30	15	15	15
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.59	Effective pHOS ->	Effective pHOS -> 0.59	Effective pHOS -> 0.59	Effective pHOS -> 0.59
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HRT Alt. 5; HSRG Sol. Max	HRT Alt. 5; HSRG Sol. Min	HRT Alt. 5; HSRG Sol. Ave	HRT Alternative 2 Max	HRT Alternative 2 Min	HRT Alternative 2 Ave	HRT Alternative 4 Max	HRT Alternative 4 Min	HRT Alternative 4 Ave
NOR Escapement	994	100	268	261	14	86	986	99	266	983	99	265	974	98	263
HoS Total Escapement (includes strays)	1,479	257	484				1,457	253	477	1,448	252	474	1,424	247	466

Table A41. *AHA* output for *Rapid River Hatchery Spring Chinook* released at the hatchery into the Rapid River (see also Table A40). HRT Alternatives refer to the South Fork Salmon River summer Chinook program.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
S.F. Salmon R	Spring Chinook
10A-Salmon_Little Salmon Spring Chinook (Rapid River-Hatchery)	

	Historic	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Segregated Hatchery	Segregated Hatchery
Population Recovery Designation:		N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HRT Alt. 5; HSRG Sol.			HRT Alternative 2			HRT Alternative 4		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.080		0.500	0.080		0.500	0.080		0.500	0.080		0.500	0.080		0.500
	Total Exploitation Rate		NORs		HORs	0.152		0.581	0.152		0.581	0.152		0.581	0.152		0.581	0.152		0.581
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			100%						100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Harv		Seg	Harv		Seg	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release	1,745		2,736,596				1,745		2,736,596	1,745		2,736,596	1,745		2,736,596
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays	220	220					220	220		220	220		220	220	
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	6.0		y	6.0		y	6.0		y	6.0		y	6.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			HRT Alt-B		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG Harvest			Current Harvest			HSRG Harvest		
Update			Hatchery																	

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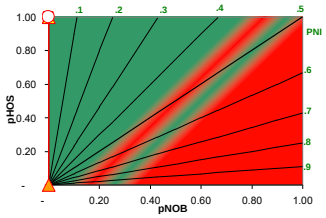
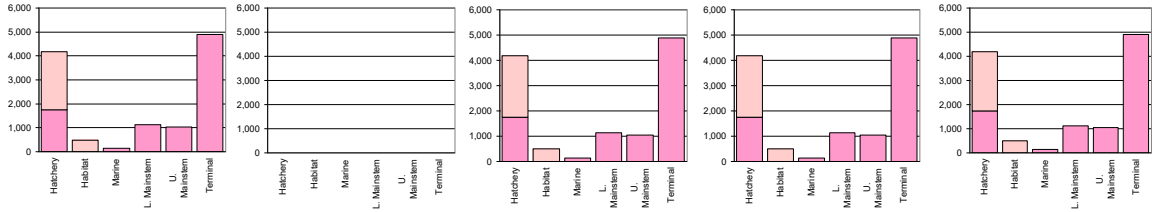
Realized Spawning Composition





	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Relative Hatchery Optimum ->	80	80	80	80	80
Weir Factor ->					
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.19	1.00	0.19	0.19	0.19
Average Fitness Factor (100 Generations) ->	0.24	0.99	0.24	0.24	0.24
Generations until average fitness is reached ->	43	30	43	43	43
Minimum Hatchery Program (% of BS Goal) ->					
"Fitness Floor" ->	Effective pHOS -> 1.00 / pNOB ->	Effective pHOS -> / pNOB ->	Effective pHOS -> 1.00 / pNOB ->	Effective pHOS -> 1.00 / pNOB ->	Effective pHOS -> 1.00 / pNOB ->
Calculated Hatchery SAR ->	0.4%	0.4%	0.4%	0.4%	0.4%
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HRT Alt. 5; HSRG Sol. Max	HRT Alt. 5; HSRG Sol. Min	HRT Alt. 5; HSRG Sol. Ave	HRT Alternative 2 Max	HRT Alternative 2 Min	HRT Alternative 2 Ave	HRT Alternative 4 Max	HRT Alternative 4 Min	HRT Alternative 4 Ave
NOR Escapement	0		0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)	1,494	259	489				1,494	259	489	1,494	259	489	1,494	259	489

Table A42. *AHA* output for South Fork Salmon River summer Chinook. The *HSRG solution* and *HRT Alternative 5* are essentially identical. *HRT Alternatives 4* and *5* represent "stepping-stone" programs. Outputs for the "production" broodstocks are presented in Table A43.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
S.F. Salmon R	Spring Chinook
11-Salmon_SF Salmon Summer Chinook	

Population Management Intent:				Harvest and Conservation			Conservation			Conservation			Conservation and Harvest			Conservation		
Harv&Hatchery Strategy:				Segregated Hatchery			Natural Reproduction only			Stepping Stone Hatchery			Integrated Hatchery			Stepping Stone Hatchery		
Population Recovery Designation:				Primary			Primary			Primary			Primary			Primary		
			Historic			Current			No Hatchery			HRT Alt. 5; HSRG Sol.			HRT Alternative 2			HRT Alternative 4		
Habitat	Productivity (Adult)	Ad. Capacity	3.00		2,150	3.00		2,150	3.00		2,150	3.00		2,150	3.00		2,150	3.00		1,075
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	300		215,000	371		265,918	371		265,918	371		265,918	371		265,918	371		132,959
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.010	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	3.00		2,150	3.00		2,150	3.00		2,150	3.00		2,150	3.00		2,150	3.00		1,075
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.020	0.020		0.080	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.050	0.050		0.080	0.050		0.050
	Harv -Terminal		NORs		HORs	0.080		0.300	0.080		0.300	0.080		0.080	0.080		0.300	0.080		0.080
	Total Exploitation Rate		NORs		HORs	0.152		0.413	0.152		0.413	0.152		0.152	0.152		0.413	0.152		0.152
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal							67%			50%			50%		
			PNI		pHOS-Realized			60%				0.55		55%	0.50		50%	0.58		36%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	Cons		None	Cons		Int	Both		Int	Cons		Int
	Broodstock by Source		Local / Imported		Smolt Release	979		1,000,224				245		250,235	480		490,406	172		175,729
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays	294	294	3				485	485	909	294	294	3	533	533	202
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.	50%		50%			100%	50%		50%	50%		50%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]	6.0		y			y	6.0		y	6.0		y	6.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			HRT Alt-B		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG Harvest			Current Harvest			HSRG Harvest		
			Hatchery																	

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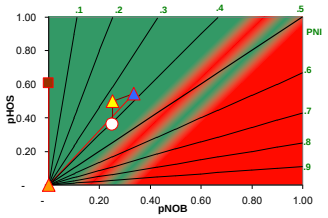
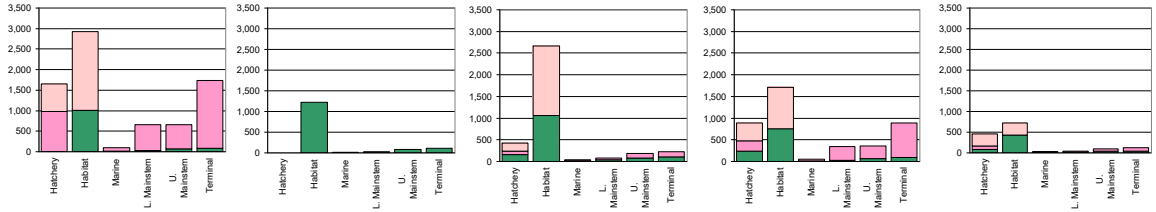
Realized Spawning Composition





Relative Hatchery Optimum ->						80					80					80					80		
Weir Factor ->																							
Relative Reproductive Success (HOS) ->						80%					80%					80%					80%		
Initial Fitness Factor (A) ->						0.81					0.81					0.81					0.81		
Fitness Factor after 100 generations (B) ->						0.50					1.00					0.70					0.63		
Average Fitness Factor (100 Generations) ->						0.50					0.99					0.71					0.66		
Generations until average fitness is reached ->						15					30					31					38		
Minimum Hatchery Program (% of BS Goal) ->				Effective pHOS ->		0.60			Effective pHOS ->			Effective pHOS ->		0.55		Effective pHOS ->	0.50			Effective pHOS ->	0.36		
"Fitness Floor" ->	0.5			pNOB ->					pNOB ->			pNOB ->		0.33		pNOB ->	0.25			pNOB ->	0.25		
Calculated Hatchery SAR ->				0.6%								0.6%				0.6%				0.6%			
Calculated Natural SAR ->				0.8%					0.8%			0.8%				0.8%				0.8%			
				Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave		
NOR Escapement				3,432	487	1,008	4,218	570	1,218	4,001	423	1,066	3,261	195	759	1,714	138	426					
HoS Total Escapement (includes strays)				5,879	1,021	1,925				4,898	850	1,604	2,887	501	945	915	158	299					

Table A43. ***AHA*** **output for the F2 "production" broodstocks associated with** ***HRT Alternatives 4*** **and** ***5*** **in the South Fork Salmon River.**

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race	Population Management Intent:	Harvest and Conservation	Conservation	Harvest	Conservation and Harvest	Conservation and Harvest
S.F. Salmon R	Spring Chinook	Harv&Hatchery Strategy:	Segregated Hatchery only	Natural Reproduction only	Segregated Stepping Stone Broodstock	Integrated Hatchery only	Segregated Stepping Stone Broodstock
11A-Salmon_SF Salmon Summer Chinook (McCall-Hatchery)		Population Recovery Designation:	N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HRT Alt. 5; HSRG Sol.			HRT Alternative 2			HRT Alternative 4		
Habitat	Productivity (Adult)	Ad. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	1		1	1		1	1		1	1		1	1		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.098	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0	0.01		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.080		0.300	0.080		0.300	0.080		0.300	0.080		0.300	0.080		0.300
	Total Exploitation Rate		NORs		HORs	0.152		0.413	0.152		0.413	0.152		0.413	0.152		0.413	0.152		0.413
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized									100%						100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	Harv		Seg	None		None	Harv		Seg
	Broodstock by Source		Local / Imported		Smolt Release								485	750,780					533	825,084
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays							194	194					194	194	
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%	50%		50%			100%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y	6.0		y			y	6.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			HRT Alt-B		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG Harvest			Current Harvest			HSRG Harvest		
			Hatchery																	

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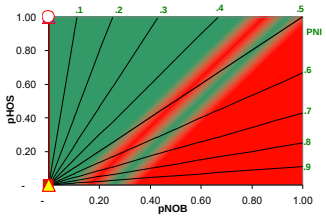
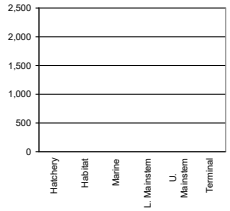
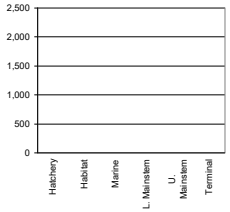
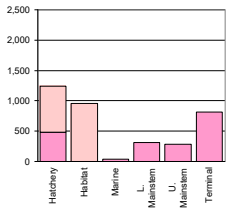
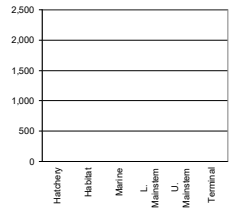
Realized Spawning Composition

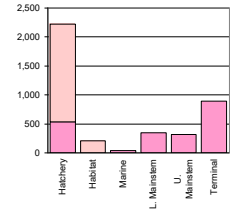












Relative Hatchery Optimum ->				80					80					80				80		
Weir Factor ->																				
Relative Reproductive Success (HOS) ->				80%					80%					80%				80%		
Initial Fitness Factor (A) ->				0.81					0.81					0.81				0.81		
Fitness Factor after 100 generations (B) ->				1.00					1.00					0.19				1.00		
Average Fitness Factor (100 Generations) ->				0.99					0.99					0.24				0.99		
Generations until average fitness is reached ->				30					30					43				30		
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->			Effective pHOS ->			Effective pHOS ->			1.00	Effective pHOS ->			Effective pHOS ->			1.00	
"Fitness Floor" ->			pNOB ->			pNOB ->			pNOB ->				pNOB ->			pNOB ->				
Calculated Hatchery SAR ->										0.4%								0.4%		
Calculated Natural SAR ->			0.8%			0.8%				0.8%			0.8%					0.8%		
			Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement				0	0	0	0	0	0	0	0	0	0	0				0	0	0
HoS Total Escapement (includes strays)									2,907	505	952							639	111	209

Table A44. *AHA* output for Secesh River spring Chinook. HRT Alternatives refer to South Fork Salmon River summer Chinook program.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
S.F. Salmon R	Spring Chinook
12-Salmon_Secesh Spring Chinook	

	Historic	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary

			Historic		Current		No Hatchery		HRT Alt. 5; HSRG Sol.		HRT Alternative 2		HRT Alternative 4	
Habitat	Productivity (Adult)	Ad. Capacity	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	41	33,750	200	166,972	200	166,972	200	166,972	200	166,972	200	166,972
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092 / 0.040	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82
	Adjusted Productivity	Adj. Capacity	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350	1.62	1,350
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
	Harv - U. Mainstem		NORs	HORs	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
	Harv -Terminal		NORs	HORs	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Total Exploitation Rate		NORs	HORs	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal										
			PNI	pHOS-Realized		20%				14%		10%		1%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	None	None	None	None	None	None	None	None	None	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		23				16		13		5
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		HRT Alt-B	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		HSRG Harvest		Current Harvest		HSRG Harvest	
	Update		Hatchery											

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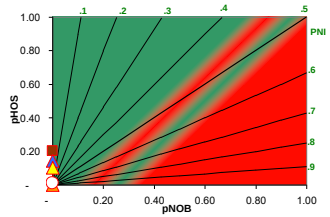
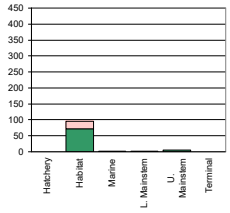
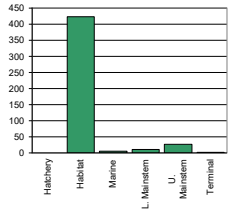
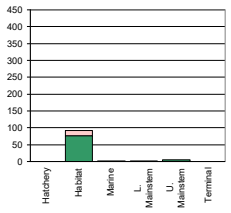
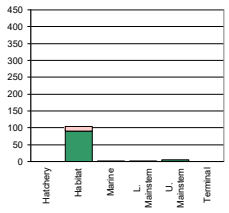
Realized Spawning Composition

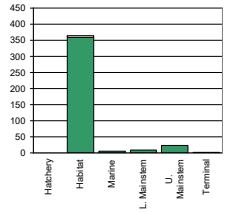












	Current	No Hatchery	HRT Alt. 5; HSRG Sol.	HRT Alternative 2	HRT Alternative 4
Relative Hatchery Optimum ->	80	80	80	80	80
Weir Factor ->					
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.50	1.00	0.50	0.50	0.92
Average Fitness Factor (100 Generations) ->	0.52	0.99	0.55	0.59	0.93
Generations until average fitness is reached ->	31	30	39	43	24
Minimum Hatchery Program (% of BS Goal) ->					
"Fitness Floor" -> 0.5	Effective pHOS -> 0.20	Effective pHOS ->	Effective pHOS -> 0.14	Effective pHOS -> 0.10	Effective pHOS -> 0.01
	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->					
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HRT Alt. 5; HSRG Sol. Max	HRT Alt. 5; HSRG Sol. Min	HRT Alt. 5; HSRG Sol. Ave	HRT Alternative 2 Max	HRT Alternative 2 Min	HRT Alternative 2 Ave	HRT Alternative 4 Max	HRT Alternative 4 Min	HRT Alternative 4 Ave
NOR Escapement	357	17	73	1,281	140	423	427	12	76	468	11	91	1,047	125	360
HoS Total Escapement (includes strays)	70	12	23				48	8	16	40	7	13	16	3	5

Table A45. AHA output for Johnson Creek summer Chinook. HRT Alternatives refer to South Fork Salmon River summer Chinook program.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
S.F. Salmon R	Spring Chinook
13-Salmon_EF-SF Johnson Creek Summer Chinook	

Population Management Intent:					Conservation			Conservation			Conservation			Conservation			Conservation			Conservation		
Harv&Hatchery Strategy:					Integrated Hatchery			Natural Reproduction only			Integrated Hatchery			Integrated Hatchery			Integrated Hatchery			Integrated Hatchery		
Population Recovery Designation:					Primary			Primary			Primary			Primary			Primary			Primary		
			Historic			Current			No Hatchery			HRT Alt. 5; HSRG Sol.			HRT Alternative 2			HRT Alternative 4		
Habitat	Productivity (Adult)	Ad. Capacity	1.45	1,700	1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700	
	Min NOR Escape	% Kelt	1		1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	36	42,500	179	210,261		179	210,261		179	210,261		179	210,261		179	210,261		179	210,261	
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040 / y	0.029	0.008 / y		0.029	0.008 / y		0.029	0.008 / y		0.029	0.008 / y		0.029	0.008 / y		0.029	0.008 / y	
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.34	0.82		0.34	0.82		0.34	0.82		0.34	0.82		0.34	0.82		0.34	0.82	
	Adjusted Productivity	Adj. Capacity	1.45	1,700	1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700		1.45	1,700	
Harvest	Harv - Marine		NORs	HORs	0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010	
	Harv - L. Mainstem		NORs	HORs	0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020		0.020	0.020	
	Harv - U. Mainstem		NORs	HORs	0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050		0.050	0.050	
	Harv -Terminal		NORs	HORs	0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005		0.005	0.005	
	Total Exploitation Rate		NORs	HORs	0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083		0.083	0.083	
Hatchery					pNOB	pHOS		pNOB	pHOS		pNOB	pHOS		pNOB	pHOS		pNOB	pHOS		pNOB	pHOS	
	Broodstock Composition		pNOB-Goal	pHOS-Goal	100%			100%			100%			100%			100%			100%		
			PNI	pHOS-Realized	0.74	36%					0.74	36%		0.74	36%		0.74	35%				
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Both	Int		None	None		Both	Int		Both	Int		Both	Int				
	Broodstock by Source		Local / Imported	Smolt Release	62		101,810				62		101,810	62		101,810	62		101,810			
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays			22						15			12			4			
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.			100%			100%			100%			100%			100%			
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	6.0	Y		6.0	y		6.0	Y		6.0	Y		6.0	Y				
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat			Current Habitat			Current Habitat			Current Habitat			HRT Alt-B					
			Hydro ----->		Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro					
			Harvest --->		Current Harvest			Current Harvest			HSRG Harvest			Current Harvest			HSRG Harvest					
			Hatchery																			

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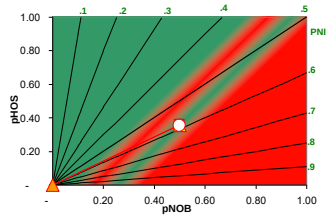
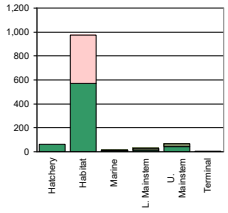
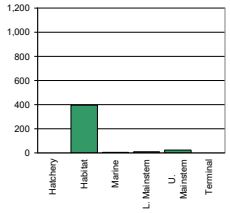
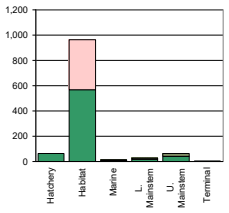
6

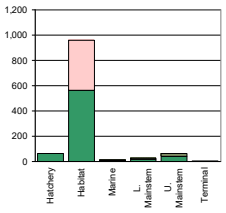
Realized Spawning Composition

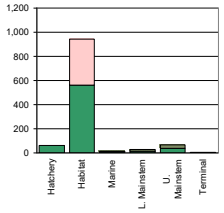












Relative Hatchery Optimum ->					80					80					80					80				80
Weir Factor ->																							
Relative Reproductive Success (HOS) ->					80%					80%					80%					80%				80%
Initial Fitness Factor (A) ->					0.81					0.81					0.81					0.81				0.81
Fitness Factor after 100 generations (B) ->					0.87					1.00					0.87					0.87				0.88
Average Fitness Factor (100 Generations) ->					0.86					0.99					0.86					0.86				0.87
Generations until average fitness is reached ->					35					30					35					35				35
Minimum Hatchery Program (% of BS Goal) ->			Effective pHOS ->		0.36			Effective pHOS ->					Effective pHOS ->		0.36			Effective pHOS ->		0.36			Effective pHOS ->	0.35
"Fitness Floor" ->	0.5		pNOB ->		0.50			pNOB ->					pNOB ->		0.50			pNOB ->		0.50			pNOB ->	0.50
Calculated Hatchery SAR ->			0.4%					0.4%					0.4%					0.4%					0.4%	
Calculated Natural SAR ->			0.8%					0.8%					0.8%					0.8%					0.8%	
			Max	Min	Ave			Max	Min	Ave			Max	Min	Ave			Max	Min	Ave			Max	Min	Ave
NOR Escapement			2,224	178	571			1,078	109	393			2,209	176	567			2,202	175	566			2,185	173	561
HoS Total Escapement (includes strays)			1,226	213	401								1,204	209	394			1,196	207	391			1,172	203	383

Table A46-A56: *AHA* outputs for the Upper Salmon River Major Population Group (MPG) of spring/summer Chinook salmon

Parameters and assumptions for spring/summer Chinook in the Upper Salmon River Major Population Group (MPG)

The Upper Salmon River MPG for spring/summer Chinook includes the mainstem Salmon River and all tributaries upstream of, and including, the North Fork Salmon River. The Interior Columbia Technical Recovery Team (ICTRT) identified nine demographically independent populations within this MPG (*AHA* Tables A46-A56). Two hatchery populations are also present within this MPG: *Pahsimeroi Hatchery Summer Chinook* and *Sawtooth Hatchery Spring Chinook*.

Table 9A. Mean values of reproductive and survival parameters assumed in the *AHA* analyses for hatchery-origin spring/summer Chinook released within the Upper Salmon River MPG. These parameter values were obtained from the HSRG, as provided by IDFG.

Hatchery/ Release location *Population/stock*	**Fecundity (No. of eggs)**	**Within-hatchery egg-to-smolt survival**	**Salmon River smolt-to-adult survival (%)**	**Recruit/spawner (R/S; adults)**
Pahsimeroi FH *Pahsimeroi Hatchery Summer Chinook*	5,000	0.80	0.39%	6.0
Sawtooth FH *Sawtooth Hatchery Spring Chinook* - Current	4,900	0.80	0.13%	2.0
Sawtooth FH *Sawtooth Hatchery Spring Chinook:* HSRG Solution and HRT Alternatives A and B	4,900	0.80	0.18%	2.5
Sawtooth FH/ *E.F. Salmon River Spring/Summer Chinook, Yankee Fork Spring Chinook Valley Creek Spring Chinook*	4,900	0.80	0.18%	2.5

Current programs, HSRG solutions, and HRT alternatives

The HRT reviewed one hatchery program in the upper Salmon River basin: the spring Chinook program at Sawtooth FH (Table 10A). The intent of the current program at the Sawthooth FH is to release 1.0M *Sawtooth Hatchery Spring Chinook* smolts annually into the mainstem Salmon River at the hatchery weir. Currently, the *Sawtooth Hatchery Spring Chinook* stock is propagated as a segregated population (*pNOB* = 0).

The *HSRG solution* involved the establishment of a second, conservation hatchery program derived from natural-origin fish trapped at the Sawtooth Hatchery weir with a mean equilibrium value of *pNOB* = 67% and an annual release of 200,000 smolts. The existing segregated hatchery population would be maintained with a maximum release of 1.2M smolts. The *HSRG Solution* requires the

maintenance of two independent hatchery populations. The HRT adopted this *HSRG Solution* as *HRT Alternative 4*.

HRT Alternative 2 would convert the existing segregated hatchery program to an integrated hatchery program. *AHA* modelling suggests that current habitat conditions would restrict an integrated hatchery program to a maximum release of 500,000 smolts, with *pNOB* = 0.5.

HRT Alternative 3 would convert the existing segregated hatchery program to a stepping stone hatchery program composed of two broodstocks where returning adults from the first "integrated" broodstock would be used as parents for the second "production" broodstock. *AHA* modeling suggests that current habitat conditions would restrict each of the two broodstocks in a stepping-stone program to a maximum release of 375,000 smolts each, with a combined maximum release of 750,000 smolts, with *pNOB* = 0.5 for the first broodstock, and *pNOB* = 0 for the second broodstock. These latter results are consistent with HSRG conclusions that a stepping stone program would not be able to meet the total desired release of 1.0M smolts under current habitat conditions. The HRT favored *Alternative 3* over *Alternative 4* (i.e., the HSRG solution) because of the large numbers of hatchery-origin spring Chinook that currently spawn in the mainstem Salmon River downstream from the hatchery weir and the presumed inability to preclude large numbers of hatchery-origin fish from a "segregated" hatchery program from spawning naturally in the mainstem Salmon River. The HRT believed this latter risk could be reduced via a "stepping stone" program, albeit with a 25% reduction in the maximum number of smolts available for release.

The HRT also examined alternatives for initiating hatchery programs on the East Fork Salmon River, Yankee Fork, and Valley Creek. Two scenarios were modeled for each population. A small integrated conservation program of 52,000 smolts (*pNOB* = 1.0) and a large segregated harvest program of 1.0M smolts (*HRT Alterantives A* and *B*, respectively) were each modeled for the E.F. Salmon River and Valley Creek. The former integrated programs of 52,000 smolts were the sizes that maximized the predicted number of natural-origin recruits returning to each of the two streams. This latter number of smolts also maximized the number of natural-origin recruits in Yankee Fork. In all three streams, productivity and capacity constraints inhibited the long-term conservation benefit of hatchery-origin fish spawning naturally. The *AHA* analyses also suggest that large segregated hatchery programs in Valley Creek and the East Fork Salmon River would not be able to meet LSRCP mitigation goals without large numbers of hatchery-origin fish escaping fisheries and potentially spawning naturally, thereby increasing biological risks to ESA listed natural populations under current harvest regimes. Based on those analyses, the HRT modeled two integrated programs for Yankee Fork, each with an annual release of 52,000 smolts, but with *pNOB* = 1.0 and 0.5, respectively.

Table 10A. Summary of the number of hatchery-origin (HOR) spring/summer Chinook smolts released into the geographic area of the Upper Salmon River MPG (upstream of the confluence of the Middle Fork Salmon River) under four strategies modeled in *AHA* Tables A46-A56: (1) *Current* programs based on the LSRCP Cooperators 2008 Annual Operating Plan for the Salmon River, (2) the *HSRG Solution*, and (3) two HRT Alternatives. [Note: The analyses for the E.F. Salmon River, Yankee Fork, and Valley Creek make no explicit assumptions regarding the location of weirs in each of those three streams. The results of the AHA analyses are based on the Beverton-Holt habitat parameters of productivity and capacity, as reported by the HSRG. Those parameters refer to the entire stream and, hence, implicitly assume that weirs would be located downstream from all natural spawning areas. With respect to the E.F. Salmon River, the analysis implicitly assumes that all spawning areas for spring Chinook are upstream of the current weir, or the weir would be moved downstream from its present location to a location on the East Fork that is downstream from all natural spawning areas.]

Release location (Hatchery)	Current	HSRG Solution	HRT Alternative A	HRT Alternative B
Pahsimeroi River (Pahsimeroi FH) *(AHA Tables A48, A49)*	• 1.0M *Pahsimeroi River* smolts (*pNOB* = 0)	• 285K *Pahsimeroi River* smolts (pNOB = 0.75) • 1.0M *Pahsimeroi River F2* smolts (*pNOB* = 0)	No recommendation (same as HSRG Solution)	No recommendation (same as HSRG Solution)
E.F. Salmon River *(AHA Table A51))*	No program	No recommendation (Same as Current)	• 52K *E.F. Salmon River* smolts (*pNOB* = 1.0)	• 1.0M *E.F. Salmon River* smolts (*pNOB* = 0)
Yankee Fork *(AHA Table A52)*	No program	No recommendation (same as Current)	**HRT Alternative 1a** • 52K *Yankee Fork* smolts (*pNOB* = 1.0)	**HRT Alternative 1b** • 52K *Yankee Fork* smolts (*pNOB* = 0.5)
Valley Creek *(AHA Table A53)*	No program	No recommendation (same as Current)	• 52K *Valley Creek* smolts (*pNOB* = 1.0)	• 1.0 M *Valley Creek* smolts (*pNOB* = 0)
Upper Salmon River (Sawtooth FH) *(AHA Tables A54, A55)*	• 1.0M *Sawtooth* smolts (*pNOB* = 0)	**HRT Alternative 4** • 200K *Upper Salmon River* smolts (*pNOB* = 0.67) • 1.2M *Sawtooth* smolts (*pNOB* = 0)	**HRT Alternative 2** • 500K *Upper Salmon River* smolts (*pNOB* = 0.5)	**HRT Alternative 3** • 375K *Upper Salmon River* smolts (*pNOB* = 0.5) • 375K *Upper Salmon River F2* smolts (*pNOB* = 0)

Table A46. AHA output for North Fork Salmon River spring Chinook.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*		Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Upper Salmon R	Spring Chinook	*Population Management Intent:*		Conservation	Conservation	Conservation	Conservation	Conservation
		Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
24-Salmon_NF Salmon River Spring Chinook		*Population Recovery Designation:*		Contributing	Contributing	Contributing	Contributing	Contributing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	1.60		550	1.60		550	1.60		550	1.60		550	1.60		550	1.60		550
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	40		13,750	198		68,026	198		68,026	198		68,026	198		68,026	198		68,026
Hydro	Ocean Surv	Baseline SAR	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.60		550	1.60		550	1.60		550	1.60		550	1.60		550	1.60		550
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.100
	Total Exploitation Rate		NORs		HORs	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			30%						28%			28%			22%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	None		None	None		None	None		None
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			24						18			19			10
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
Update			Hatchery																	

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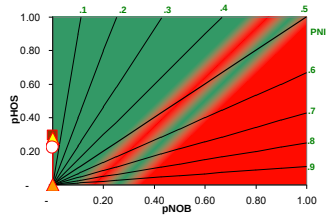
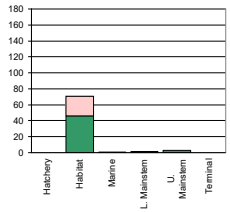
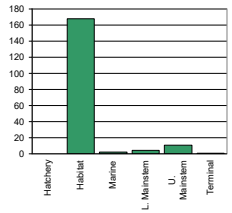
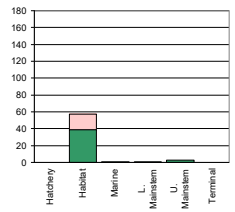
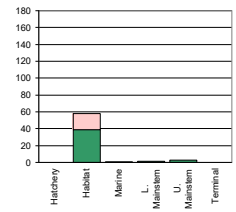
Realized Spawning Composition

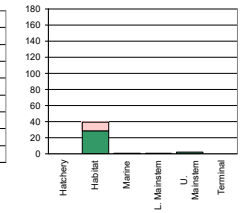












		Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->			80	80	80	80	80
Weir Factor ->							
Relative Reproductive Success (HOS) ->			80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->			0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->			0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->			0.50	0.99	0.50	0.50	0.52
Generations until average fitness is reached ->			21	30	22	22	
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	0.30	Effective pHOS ->	Effective pHOS -> 0.28	Effective pHOS -> 0.28	Effective pHOS -> 0.22
"Fitness Floor" ->	0.5	pNOB ->		pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->							
Calculated Natural SAR ->		0.8%		0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	146	14	46	502	55	168	122	11	39	123	11	39	130	7	29
HoS Total Escapement (includes strays)	74	13	24				56	10	18	57	10	19	31	5	10

Table A47. AHA output for Lemhi River spring Chinook.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Upper Salmon R	Spring Chinook

25-Salmon_Lemhi River Spring Chinook

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Primary	Primary	Primary	Primary	Primary
Habitat						
Productivity (Adult) / Ad. Capacity	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900
Min NOR Escape / % Kelt	1	1	1	1	1	1
Smolt Productivity / Sm. Capacity	33 / 97,500	162 / 482,363	162 / 482,363	162 / 482,363	162 / 482,363	162 / 482,363
Hydro						
Ocean Surv / Baseline SAR / Vary? (Y/N)	0.092 / 0.040 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y	0.029 / 0.008 / y
Juv Passage Surv. / Adult Passage	1.00 / 1.00	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82	0.34 / 0.82
Adjusted Productivity / Adj. Capacity	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900	1.31 / 3,900
Harvest						
Harv - Marine	NORs / HORs	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010
Harv - L. Mainstem	NORs / HORs	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080	0.020 / 0.080
Harv - U. Mainstem	NORs / HORs	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080	0.050 / 0.080
Harv -Terminal	NORs / HORs	0.005 / 0.100	0.005 / 0.100	0.005 / 0.100	0.005 / 0.100	0.005 / 0.100
Total Exploitation Rate	NORs / HORs	0.083 / 0.246	0.083 / 0.246	0.083 / 0.246	0.083 / 0.246	0.083 / 0.246
Hatchery						
		pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS	pNOB / pHOS
Broodstock Composition	pNOB-Goal / pHOS-Goal					
	PNI / pHOS-Realized	30%		27%	27%	15%
Purpose / Type	Cons/Harv/Both / Int/Seg/Step/None	None / None	None / None	None / None	None / None	None / None
Broodstock by Source	Local / Imported / Smolt Release					
Brood Exported (from HOR Surplus)	Export Goal/Realized / Strays	24		18	19	10
Destination for HOR Returns	% to Hatchery / % to Nat. Spawn.	100%	100%	100%	100%	100%
Productivity of Hatchery Fish	Recruits/Spawner / Fitness? [Y / N]	y	y	y	y	y
Patterns (Update)	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.					
	Habitat ----->	Current Habitat	Current Habitat	Current Habitat	Current Habitat	Current Habitat
	Hydro ----->	Current Hydro	Current Hydro	Current Hydro	Current Hydro	Current Hydro
	Harvest --->	Current Harvest	Current Harvest	HSRG	HRT-A	HRT-B
	Hatchery					

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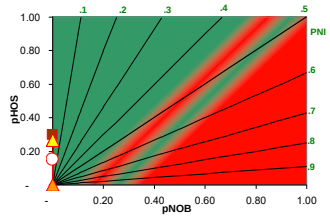
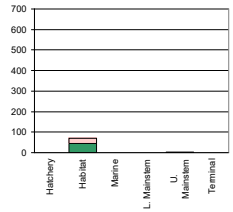
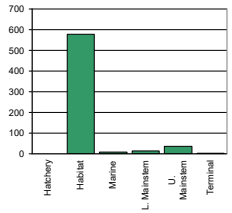
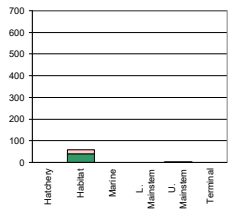
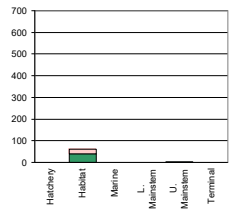
Realized Spawning Composition

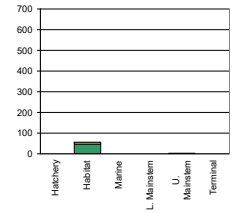












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.51	0.99	0.52	0.52	0.57
Generations until average fitness is reached ->			30			39
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.30	Effective pHOS ->	Effective pHOS -> 0.27	Effective pHOS -> 0.27	Effective pHOS -> 0.15
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Max	HSRG Min	HSRG Ave	HRT-A Max	HRT-A Min	HRT-A Ave	HRT-B Max	HRT-B Min	HRT-B Ave
NOR Escapement	214	10	46	1,551	116	578	254	8	41	252	8	41	356	4	46
HoS Total Escapement (includes strays)	74	13	24				56	10	18	57	10	19	31	5	10

Table A48. AHA output for Pahsimeroi River summer Chinook.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook

26-Salmon_Pahsimeroi Summer Chinook

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:	Harvest and Conservation	Harvest and Conservation	Conservation	Harvest and Conservation	Harvest and Conservation	Harvest and Conservation
Harv&Hatchery Strategy:	Segregated Hatchery	Segregated Hatchery	Natural Reproduction only	Stepping Stone Integrated Hatchery	Stepping Stone Integrated Hatchery	Stepping Stone Integrated Hatchery
Population Recovery Designation:	Primary	Primary	Primary	Primary	Primary	Primary

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)		Ad. Capacity	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200
	Min NOR Escape		% Kelt	1			1			1			1			1			1		
	Smolt Productivity		Sm. Capacity	43		80,000	210		395,785	210		395,785	210		395,785	210		395,785	210		395,785
Hydro	Ocean Surv	Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.		Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity		Adj. Capacity	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200	1.70		3,200
Harvest	Harv - Marine			NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem			NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.020	0.020		0.020	0.020		0.020
	Harv - U. Mainstem			NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.050	0.050		0.050	0.050		0.050
	Harv -Terminal			NORs		HORs	0.080		0.100	0.080		0.100	0.080		0.080	0.080		0.080	0.080		0.080
	Total Exploitation Rate			NORs		HORs	0.152		0.246	0.152		0.246	0.152		0.152	0.152		0.152	0.152		0.152
Hatchery							pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition			pNOB-Goal		pHOS-Goal							75%			75%			75%		
				PNI		pHOS-Realized			37%						33%			33%			33%
	Purpose		Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	None		None	Cons		Step	Cons		Step	Cons		Step
	Broodstock by Source			Local	Imported	Smolt Release	526		999,400				150		285,000	150		285,000	150		285,000
	Brood Exported (from HOR Surplus)			Export Goal/Realized		Strays			23				526	525	478	526	525	478	526	525	470
	Destination for HOR Returns			% to Hatchery		% to Nat. Spawn.	90%		10%			100%	90%		10%	90%		10%	90%		10%
	Productivity of Hatchery Fish			Recruits/Spawner		Fitness? [Y / N]	6.0		y			y	6.0		y	6.0		y	6.0		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.			Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
				Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
				Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
Update				Hatchery																	

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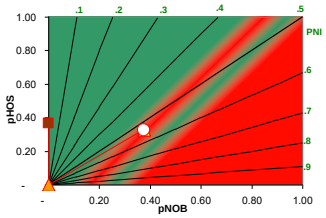
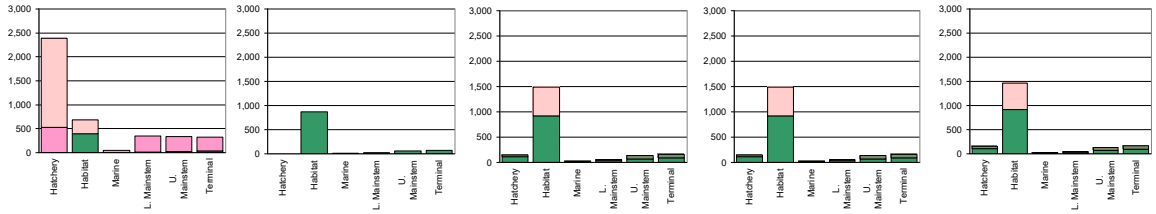
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->	80	80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.50	1.00	0.84	0.84	0.84	0.84
Average Fitness Factor (100 Generations) ->	0.50	0.99	0.83	0.83	0.83	0.83
Generations until average fitness is reached ->	18	30	25	25	25	34
Minimum Hatchery Program (% of BS Goal) ->						
"Fitness Floor" -> 0.5	Effective pHOS -> 0.37	Effective pHOS ->	Effective pHOS -> 0.33	Effective pHOS -> 0.33	Effective pHOS -> 0.33	Effective pHOS -> 0.33
	pNOB ->	pNOB ->	pNOB -> 0.38	pNOB -> 0.38	pNOB -> 0.38	pNOB -> 0.38
Calculated Hatchery SAR ->	0.3%		0.3%	0.3%	0.3%	0.3%
Calculated Natural SAR ->	0.8%	0.8%		0.8%	0.8%	0.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	1,362	128	398	2,550	273	863	3,561	269	920	3,561	269	921	3,540	267	916			
HoS Total Escapement (includes strays)	881	152	288				1,719	298	563	1,720	299	563	1,694	294	554			

Table A49. AHA output for Pahsimeroi Hatchery summer Chinook resulting from the second segregated broodstock of a two-stage "stepping stone" hatchery program, as proposed by the HSRG.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Upper Salmon R	Spring Chinook
26A-Salmon_Pahsimeroi Summer Chinook (Pahsimeroi Hatchery)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Harvest	Conservation	Harvest	Harvest	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Stepping Stone Segregated Hatchery	Stepping Stone Segregated Hatchery	Stepping Stone Segregated Hatchery
Population Recovery Designation:		N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs			0.010			0.010			0.010			0.010			0.010
	Harv - L. Mainstem		NORs		HORs			0.080			0.080			0.080			0.080			0.080
	Harv - U. Mainstem		NORs		HORs			0.080			0.080			0.080			0.080			0.080
	Harv -Terminal		NORs		HORs			0.100			0.100			0.100			0.100			0.100
	Total Exploitation Rate		NORs		HORs			0.246			0.246			0.246			0.246			0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized									100%			100%			100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Harv		Seg	None		None	Harv		Step	Harv		Step	Harv		Step
	Broodstock by Source		Local / Imported		Smolt Release								526	999,400		526	999,400		526	999,400
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%	50%		50%	50%		50%	50%		50%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y	6.0		y	6.0		y	6.0		y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
			Hatchery																	

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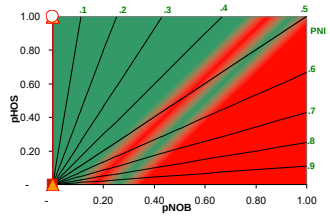
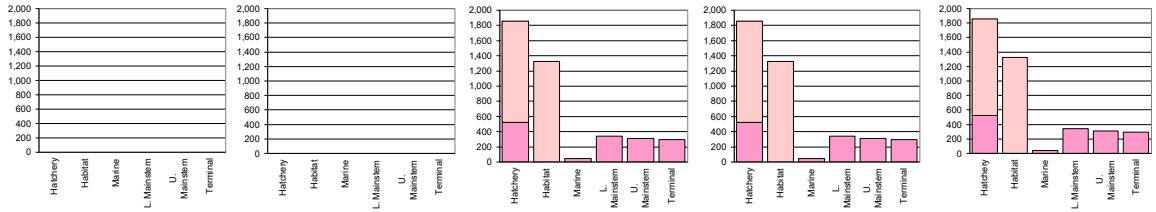
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		1.00	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.99	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->		30	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS ->	Effective pHOS ->	Effective pHOS -> 1.00	Effective pHOS -> 1.00	Effective pHOS -> 1.00
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->				0.3%	0.3%	0.3%
Calculated Natural SAR ->	0.8%		0.8%	0.8%	0.8%	0.8%

	Historic Max	Historic Min	Historic Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)							4,054	704	1,327	4,054	704	1,327	4,054	704	1,327

Table A50. AHA output for spring Chinook spawning in lower section of upper Salmon River, from mouth of Lemhi River to Redfish Lake Creek.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook
27-Salmon_Lower Salmon Mainstem Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Natural Reproduction only
Population Recovery Designation:		Contributing	Contributing	Contributing	Contributing	Contributing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	38		50,000	186		247,366	186		247,366	186		247,366	186		247,366	186		247,366
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000	1.50		2,000
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.100
	Total Exploitation Rate		NORs		HORs	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized			22%						30%			20%			23%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	None		None	None		None	None		None
	Broodstock by Source		Local	Imported	Smolt Release															
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			24						61			21			25
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%			100%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y			y			y
Patterns / Update	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
			Hatchery																	

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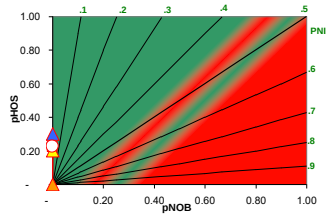
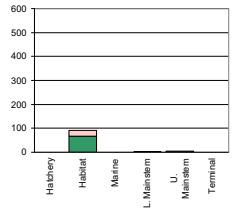
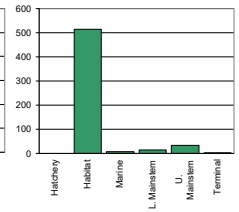
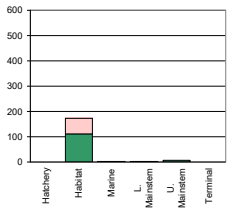
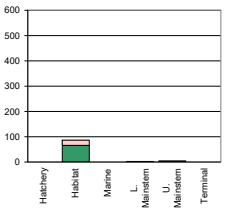
Realized Spawning Composition

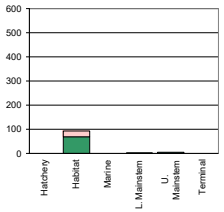












	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->		0.52	0.99	0.50	0.53	0.52
Generations until average fitness is reached ->			30	22		30
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.22	Effective pHOS ->	Effective pHOS -> 0.30	Effective pHOS -> 0.20	Effective pHOS -> 0.23
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->						
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%	

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	356	14	68	1,457	152	514	367	32	112	388	13	67	350	15	68
HoS Total Escapement (includes strays)	74	13	24				186	32	61	64	11	21	76	13	25

Table A51. AHA output for East Fork Salmon River spring/summer Chinook. HRT Alternative A represents a small, integrated conservation program, and HRT Alternative B represents a large segregated program in partial support for achieving LSRCP mitigation goals.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook

28-Salmon_East Fork Salmon River Spring-Summer Chinook

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Harvest
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Integrated Hatchery + Supplementation	Segregated Hatchery
Population Recovery Designation:		Contributing	Contributing	Contributing	Contributing	Contributing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	37		37,500	181		185,524	181		185,524	181		185,524	181		185,524	181		185,524
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	Y	0.029	0.008	Y	0.029	0.008	Y	0.029	0.008	Y	0.029	0.008	Y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500	1.46		1,500
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.020	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.050	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.005	0.005		0.100
	Total Exploitation Rate		NORs		HORs	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.083	0.083		0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal										100%					
			PNI		pHOS-Realized			28%						29%	0.85		18%			39%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	None		None	Cons		Int	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release										30		52,744	567		1,000,189
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			24						27			28			19
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%	90%		10%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y	2.5		y	2.5		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
	Update		Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
			Hatchery																	

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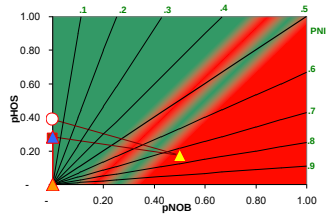
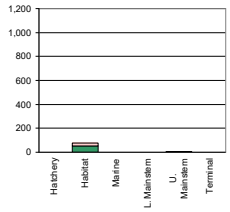
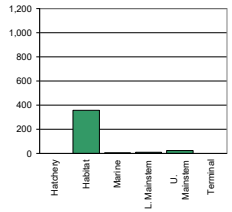
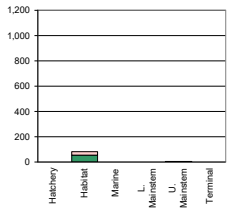
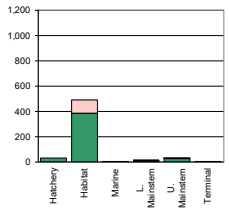
Realized Spawning Composition

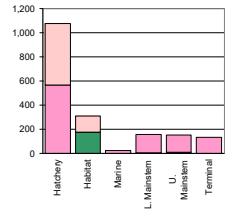












		Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.95	0.50
Average Fitness Factor (100 Generations) ->		0.51	0.99	0.51	0.93	0.50
Generations until average fitness is reached ->		27	30	26	44	18
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.28	Effective pHOS ->	Effective pHOS -> 0.29	Effective pHOS -> 0.18	Effective pHOS -> 0.39
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB -> 0.50	pNOB ->
Calculated Hatchery SAR ->					0.1%	0.1%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	187	13	51	980	100	355	178	14	55	1,318	95	388	595	55	174
HoS Total Escapement (includes strays)	74	13	24				83	14	27	317	55	104	422	73	138

Table A52. AHA output for Yankee Fork spring Chinook. HRT Alternatives A and B represent small integrated conservation programs to increase the overall recruit per spawner ratio for the population as a whole. Two different broodstock strategies are modeled.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook
29-Salmon_Yankee Fork Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Conservation
Harv&Hatchery Strategy:		Natural Reproduction only - Captive Rearing	Natural Reproduction only	Natural Reproduction only - Captive Rearing	Integrated Hatchery + Supplementation	Integrated Hatchery + Supplementation
Population Recovery Designation:		Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	1.45		600	1.45		600	1.45		600	1.45		600	1.45		600	1.45		600
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	36		15,000	179		74,210	179		74,210	179		74,210	179		74,210	179		74,210
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.45		600	1.45		600	1.45		600	1.45		600	1.45		600	1.45		600
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.020	0.020		0.020
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.050	0.050		0.050
	Harv -Terminal		NORs		HORs	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.005	0.005		0.005
	Total Exploitation Rate		NORs		HORs	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.083	0.083		0.083
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal										100%			50%		
			PNI		pHOS-Realized			34%						46%	0.72		40%	0.55		41%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	None		None	Cons		Int	Cons		Int
	Broodstock by Source		Local	Imported	Smolt Release										30		52,744	30		52,821
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			24						114			81			83
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%	25%		75%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y	2.5		y	2.5		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
	Update		Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
			Hatchery																	

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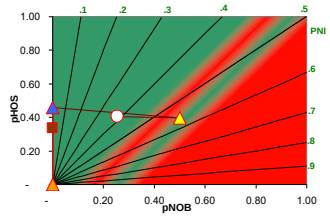
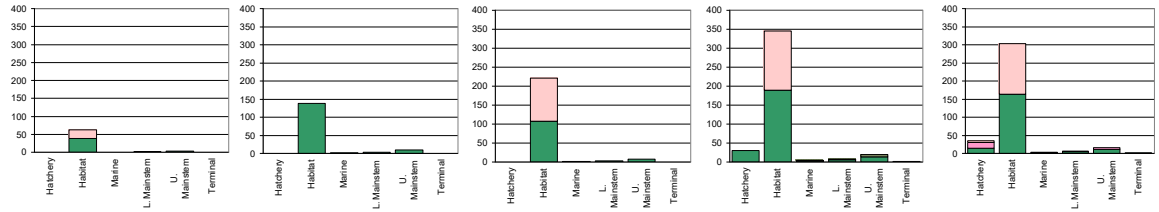
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.85	0.69
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.85	0.72
Generations until average fitness is reached ->		20	30	17	34	32
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.34	Effective pHOS ->	Effective pHOS -> 0.46	Effective pHOS -> 0.40	Effective pHOS -> 0.41
"Fitness Floor" -> 0.5		pNOB ->	pNOB ->	pNOB ->	pNOB -> 0.50	pNOB -> 0.26
Calculated Hatchery SAR ->					0.1%	0.1%
Calculated Natural SAR ->	0.8%		0.8%	0.8%	0.8%	0.8%

	Historic Max	Historic Min	Historic Ave	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	127	11	38	381	39	139	389	38	108	766	51	190	616	49	164			
HoS Total Escapement (includes strays)	74	13	24				348	60	114	479	83	157	427	74	140			

Table A53. AHA output for Valley Creek spring Chinook. HRT Alternative A represents a small, integrated conservation program, and HRT Alternative B represents a large segregated program in partial support for achieving LSRCP mitigation goals.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	Species/Race
Upper Salmon R	Spring Chinook
30-Salmon_Valley Spring Chinook	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Conservation	Conservation	Conservation	Conservation	Harvest
Harv&Hatchery Strategy:		Natural Reproduction only	Natural Reproduction only	Natural Reproduction only	Integrated Hatchery	Segregated Hatchery
Population Recovery Designation:		Contributing	Contributing	Contributing	Contributing	Contributing

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	1.55		800	1.55		800	1.55		800	1.55		800	1.55		800	1.55		800
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	39		20,000	192		98,946	192		98,946	192		98,946	192		98,946	192		98,946
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	1.55		800	1.55		800	1.55		800	1.55		800	1.55		800	1.55		800
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.020	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.050	0.050		0.080
	Harv -Terminal		NORs		HORs	0.005		0.100	0.005		0.100	0.005		0.100	0.005		0.005	0.005		0.100
	Total Exploitation Rate		NORs		HORs	0.083		0.246	0.083		0.246	0.083		0.246	0.083		0.083	0.083		0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal										100%					
			PNI		pHOS-Realized			28%						28%	0.80		25%			63%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	None		None	None		None	None		None	Cons		Int	Harv		Seg
	Broodstock by Source		Local	Imported	Smolt Release										30		52,744	577		1,001,113
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays			24						22			21			13
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%			100%			100%	50%		50%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y			y	2.5		y	2.5		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
			Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
	Update		Hatchery																	

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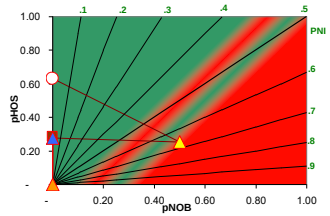
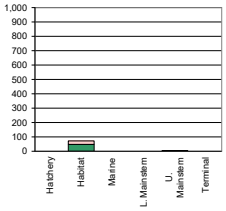
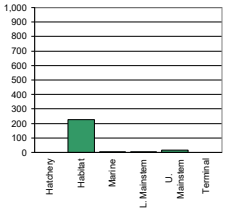
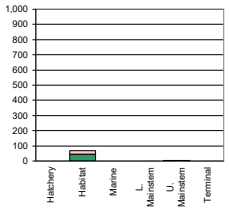
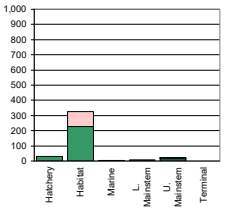
Realized Spawning Composition

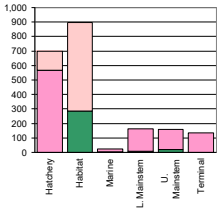












		Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		0.50	1.00	0.50	0.92	0.50
Average Fitness Factor (100 Generations) ->		0.50	0.99	0.50	0.90	0.50
Generations until average fitness is reached ->		22	30	23	44	15
Minimum Hatchery Program (% of BS Goal) ->		Effective pHOS -> 0.28	Effective pHOS ->	Effective pHOS -> 0.28	Effective pHOS -> 0.25	Effective pHOS -> 0.63
"Fitness Floor" ->	0.5	pNOB ->	pNOB ->	pNOB ->	pNOB -> 0.50	pNOB ->
Calculated Hatchery SAR ->					0.1%	0.1%
Calculated Natural SAR ->		0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	155	14	49	657	70	225	146	13	46	851	55	228	1,033	121	285
HoS Total Escapement (includes strays)	74	13	24				68	12	22	297	51	97	1,891	313	611

Table A54. AHA output for upper Salmon River spring Chinook, including Sawtooth Hatchery, upstream from Redfish Lake Creek. HRT Alternative A represents a large integrated program, and HRT Alternative B represents a two=stage stepping stone program.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook
31-Salmon_Upper Salmon Mainstem Spring Chinook	

	Historic		Current		No Hatchery		HSRG Solution		HRT Alternative A		HRT Alternative B	
Population Management Intent:			Harvest and Conservation		Conservation		Conservation		Harvest and Conservation		Harvest and Conservation	
Harv&Hatchery Strategy:			Segregated Hatchery		Natural Reproduction only		Integrated Hatchery		Integrated Hatchery		Stepping Stone - Integrated Hatchery	
Population Recovery Designation:			Primary		Primary		Primary		Primary		Primary	
Habitat												
Productivity (Adult)	Ad. Capacity	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000
Min NOR Escape	% Kelt	1		1		1		1		1		1	
Smolt Productivity	Sm. Capacity	45	50,000	223	247,366	223	247,366	223	247,366	223	247,366	223	247,366
Hydro													
Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092 / 0.040	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y
Juv Passage Surv.	Adult Passage	1.00	1.00	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82
Adjusted Productivity	Adj. Capacity	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000	1.80	2,000
Harvest													
Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Harv - L. Mainstem		NORs	HORs	0.020	0.080	0.020	0.080	0.020	0.020	0.020	0.080	0.020	0.020
Harv - U. Mainstem		NORs	HORs	0.050	0.080	0.050	0.080	0.050	0.050	0.050	0.080	0.050	0.050
Harv -Terminal		NORs	HORs	0.080	0.100	0.080	0.100	0.080	0.080	0.080	0.100	0.080	0.080
Total Exploitation Rate		NORs	HORs	0.152	0.246	0.152	0.246	0.152	0.152	0.152	0.246	0.152	0.152
Hatchery													
				pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
Broodstock Composition		pNOB-Goal	pHOS-Goal					67%		50%		50%	
		PNI	pHOS-Realized		38%			0.72	27%	0.50	50%		40%
Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	Harv	Seg	None	None	Cons	Int	Both	Int	Cons	Step
Broodstock by Source		Local / Imported	Smolt Release	532	1,001,011			106	199,393	267	499,207	200	376,320
Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		23				117		26	200 / 164	47
Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.	75%	25%		100%	50%	50%	25%	75%	50%	50%
Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]	2.0	y		y	2.5	y	2.5	y	2.5	y
Patterns (Update)	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.	Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
		Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
		Harvest --->		Current Harvest		Current Harvest		HSRG		HRT-A		HRT-B	
		Hatchery											

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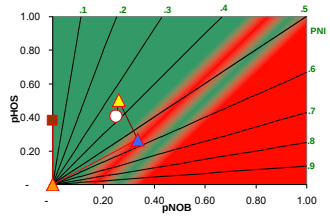
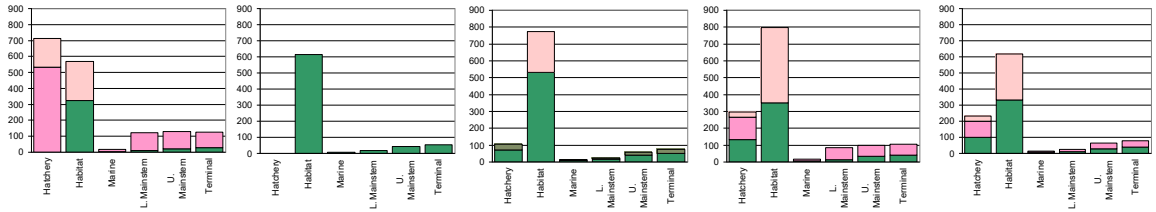
Realized Spawning Composition





	Hatchery	Habitat	Marine	L. Mainstem	U. Mainstem	Terminal
Relative Hatchery Optimum ->	80	80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.50	1.00	0.85	0.61	0.66	0.66
Average Fitness Factor (100 Generations) ->	0.50	0.99	0.85	0.66	0.70	0.70
Generations until average fitness is reached ->	18	30	34	40	39	39
Minimum Hatchery Program (% of BS Goal) ->	Effective pHOS -> 0.38	Effective pHOS ->	Effective pHOS -> 0.27	Effective pHOS -> 0.50	Effective pHOS -> 0.40	
"Fitness Floor" -> 0.5	pNOB ->	pNOB ->	pNOB -> 0.33	pNOB -> 0.26	pNOB -> 0.25	
Calculated Hatchery SAR ->	0.1%		0.1%	0.1%	0.1%	
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%	

	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
NOR Escapement	1,134	110	322	1,897	209	615	2,003	147	533	1,555	12	352	1,316	35	334
HoS Total Escapement (includes strays)	755	130	247				740	128	242	1,366	237	445	864	150	283

Table A55. AHA output for segregated broodstock portions of Sawtooth Hatchery spring Chinook. The HSRG proposed separate integrated and segregated programs. The HRT proposed coupling these programs as a two-stage stepping stone program (HRT Alternative B).

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook

31A-Salmon_Upper Salmon Mainstem
Spring Chinook (Sawtooth Hatchery)

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:		Harvest and Conservation	Conservation	Harvest	Harvest and Conservation	Harvest
Harv&Hatchery Strategy:		Segregated Hatchery	Natural Reproduction only	Segregated Hatchery	Integrated Hatchery	Stepping Stone Segregated Hatchery
Population Recovery Designation:		N/A	N/A	N/A	N/A	N/A

			Historic			Current			No Hatchery			HSRG Solution			HRT Alternative A			HRT Alternative B		
Habitat	Productivity (Adult)	Ad. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
	Min NOR Escape	% Kelt	1			1			1			1			1			1		
	Smolt Productivity	Sm. Capacity	0		0	0		1	0		1	0		1	0		1	0		1
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092	0.040	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y	0.029	0.008	y
	Juv Passage Surv.	Adult Passage	1.00		1.00	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82	0.34		0.82
	Adjusted Productivity	Adj. Capacity	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0	0.00		0
Harvest	Harv - Marine		NORs		HORs	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010	0.010		0.010
	Harv - L. Mainstem		NORs		HORs	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080	0.020		0.080
	Harv - U. Mainstem		NORs		HORs	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080	0.050		0.080
	Harv -Terminal		NORs		HORs	0.080		0.100	0.080		0.100	0.080		0.100	0.080		0.100	0.080		0.100
	Total Exploitation Rate		NORs		HORs	0.152		0.246	0.152		0.246	0.152		0.246	0.152		0.246	0.152		0.246
Hatchery						pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS	pNOB		pHOS
	Broodstock Composition		pNOB-Goal		pHOS-Goal															
			PNI		pHOS-Realized									100%	1.00					100%
	Purpose	Type	Cons/Harv/Both		Int/Seg/Step/None	Both		Seg	None		None	Harv		Seg	Both		Int	Harv		Step
	Broodstock by Source		Local	Imported	Smolt Release							638		1,200,461					200	376,320
	Brood Exported (from HOR Surplus)		Export Goal/Realized		Strays															
	Destination for HOR Returns		% to Hatchery		% to Nat. Spawn.			100%			100%	75%		25%			100%	75%		25%
	Productivity of Hatchery Fish		Recruits/Spawner		Fitness? [Y / N]			y			y	2.5		y			y	2.5		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->			Current Habitat			Current Habitat			Current Habitat			Current Habitat			Current Habitat		
	Update		Hydro ----->			Current Hydro			Current Hydro			Current Hydro			Current Hydro			Current Hydro		
			Harvest --->			Current Harvest			Current Harvest			HSRG			HRT-A			HRT-B		
			Hatchery																	

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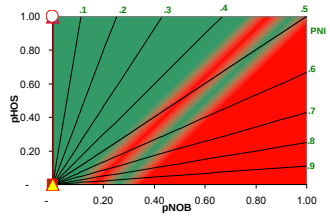
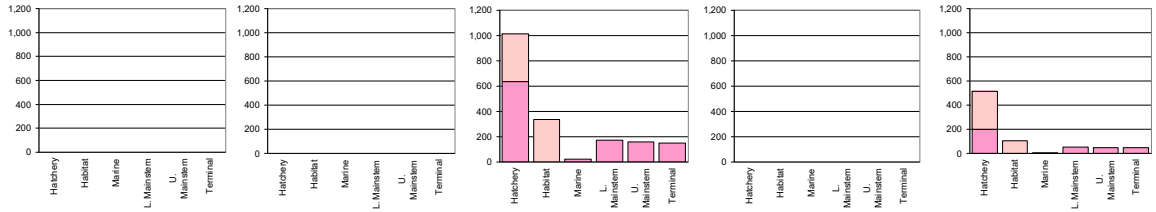
Realized Spawning Composition





	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->		80	80	80	80	80
Weir Factor ->						
Relative Reproductive Success (HOS) ->		80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->		0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->		1.00	1.00	0.19	1.00	0.19
Average Fitness Factor (100 Generations) ->		0.99	0.99	0.24	0.99	0.24
Generations until average fitness is reached ->		30	30	43	30	43
Minimum Hatchery Program (% of BS Goal) ->				1.00		1.00
"Fitness Floor" ->						
Effective pHOS ->						
pNOB ->						
Calculated Hatchery SAR ->				0.1%		0.1%
Calculated Natural SAR ->	0.8%		0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT A Max	HRT A Min	HRT A Ave	HRT B Max	HRT B Min	HRT B Ave
NOR Escapement		0	0	0	0	0	0	0	0	0	0	0	0	0	0
HoS Total Escapement (includes strays)							1,024	177	335				321	55	105

Table A56. AHA output for Panther Creek spring Chinook.

All H Analyzer (AHA)

Apply & Recalculate

Population (Ctrl + Page Up/Down to Scroll)

Subregion/Subbasin	*Species/Race*
Upper Salmon R	Spring Chinook
32-Salmon_Panther Creek Spring Chinook (Extirpated)	

	Historic	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Population Management Intent:	Conservation-Reintrodution	Conservation-Reintrodution	Conservation-Reintrodution	Conservation-Reintrodution	Conservation-Reintrodution	Conservation-Reintrodution
Harv&Hatchery Strategy:	Habitat Restoration	Habitat Restoration	Habitat Restoration	Habitat Restoration	Habitat Restoration	Habitat Restoration
Population Recovery Designation:	Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing	Stabilizing

			Historic		Current		No Hatchery		HSRG Solution		HRT Alternative A		HRT Alternative B	
Habitat	Productivity (Adult)	Ad. Capacity	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200
	Min NOR Escape	% Kelt	1		1		1		1		1		1	
	Smolt Productivity	Sm. Capacity	3	30,000	12	148,419	12	148,419	12	148,419	12	148,419	12	148,419
Hydro	Ocean Surv / Baseline SAR	Vary? (Y/N)	0.092 / 0.040	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y	0.029 / 0.008	y
	Juv Passage Surv.	Adult Passage	1.00	1.00	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82	0.34	0.82
	Adjusted Productivity	Adj. Capacity	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200	0.10	1,200
Harvest	Harv - Marine		NORs	HORs	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	Harv - L. Mainstem		NORs	HORs	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
	Harv - U. Mainstem		NORs	HORs	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
	Harv -Terminal		NORs	HORs	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Total Exploitation Rate		NORs	HORs	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Hatchery					pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS	pNOB	pHOS
	Broodstock Composition		pNOB-Goal	pHOS-Goal										
			PNI	pHOS-Realized		94%				94%		94%		94%
	Purpose	Type	Cons/Harv/Both	Int/Seg/Step/None	None	None	None	None	None	None	None	None	None	None
	Broodstock by Source		Local / Imported	Smolt Release										
	Brood Exported (from HOR Surplus)		Export Goal/Realized	Strays		24				18		19		10
	Destination for HOR Returns		% to Hatchery	% to Nat. Spawn.		100%		100%		100%		100%		100%
	Productivity of Hatchery Fish		Recruits/Spawner	Fitness? [Y / N]		y		y		y		y		y
Patterns	Patterns shown here are assigned to the population from the AHA or ROL file. Red cells indicate patterns are not assigned to this population/scenario in the rollup application. The shown pattern needs to be added to the application, or a different pattern should be assigned to this population in the ROL/AHA file.		Habitat ----->		Current Habitat		Current Habitat		Current Habitat		Current Habitat		Current Habitat	
			Hydro ----->		Current Hydro		Current Hydro		Current Hydro		Current Hydro		Current Hydro	
			Harvest --->		Current Harvest		Current Harvest		HSRG		HRT-A		HRT-B	
	Update		Hatchery											

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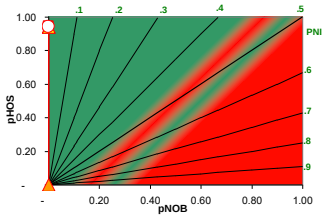
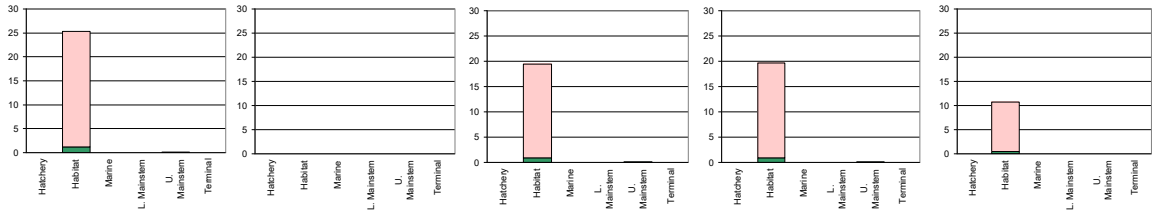
Realized Spawning Composition





	Current	No Hatchery	HSRG Solution	HRT Alternative A	HRT Alternative B
Relative Hatchery Optimum ->	80	80	80	80	80
Weir Factor ->					
Relative Reproductive Success (HOS) ->	80%	80%	80%	80%	80%
Initial Fitness Factor (A) ->	0.81	0.81	0.81	0.81	0.81
Fitness Factor after 100 generations (B) ->	0.50	1.00	0.50	0.50	0.50
Average Fitness Factor (100 Generations) ->	0.50	0.99	0.50	0.50	0.50
Generations until average fitness is reached ->	12	30	12	12	12
Minimum Hatchery Program (% of BS Goal) ->					
"Fitness Floor" -> 0.5	Effective pHOS -> 0.94	Effective pHOS ->	Effective pHOS -> 0.94	Effective pHOS -> 0.94	Effective pHOS -> 0.94
	pNOB ->	pNOB ->	pNOB ->	pNOB ->	pNOB ->
Calculated Hatchery SAR ->					
Calculated Natural SAR ->	0.8%	0.8%	0.8%	0.8%	0.8%

	Current Max	Current Min	Current Ave	No Hatchery Max	No Hatchery Min	No Hatchery Ave	HSRG Solution Max	HSRG Solution Min	HSRG Solution Ave	HRT Alternative A Max	HRT Alternative A Min	HRT Alternative A Ave	HRT Alternative B Max	HRT Alternative B Min	HRT Alternative B Ave
NOR Escapement	5	0	1	0	0	0	4	0	1	4	0	1	2	0	0
HoS Total Escapement (includes strays)	74	13	24				56	10	18	57	10	19	31	5	10

Pacific Region Fishery Resources
911 NE 11th Avenue
Portland, OR 97232
503/872.2763
E-Mail: Don_Campton@fws.gov

U.S. Fish and Wildlife Service
www.fws.gov

For Columbia River Basin Hatchery Review Information
www.fws.gov/pacific/Fisheries/Hatcheryreview/

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March 2011