

DRAFT – FOR INTERNAL DISTRIBUTION ONLY 7/24/06

This information is generally sourced from HGMPs and the Steelhead Science Paper (SSP). It will be used to develop WRIA-specific information that would follow the overarching/guidelines sections of the steelhead Resource Management Plan. The information (including alternatives) summarized from this template will be combined with templates for the remaining nine WRIsAs to build the watershed/ecosystem-based specific policy recommendations section. Harvest, Hatchery and Monitoring needs and alternatives will be evaluated and prioritized in the Implementation section (7) of the Puget Sound RMP.

Section numbering corresponds to the structure of the plan outline (20060719) document.

Steelhead Management Plan (WRIA) Template

[from HGMP]



WRIA or River System	WRIA 03 (and 04) – Skagit River System
DPS (or ESU)	Puget Sound DPS
Co-Managers	Skagit System COOP, Swinomish, Upper Skagit, and Sauk-Suiattle
Sub-Region, Major Streams, and SaSI Stocks	North Puget Sound Subregion – Skagit, Sauk, Cascade excludes Samish (independent drainage that is associated with Nooksack WRIA 01)
Hatchery Facilities and Type of Program	Barnaby and Marblemount Hatcheries Segregated Harvest Programs
Date Last Updated:	24 Jul 06

SECTION 3 Environmental Setting

3.1 Geographic Bounds of the Planning Area Population Structure, origin and composition

What were the historical populations of Steelhead in Puget Sound [watershed]?

How have anthropogenic factors such as hatchery programs and habitat modifications affected population structure?

What is the source of broodstock for hatchery programs in each region?

[from HGMP]

Skagit River System

Puget Sound DPS; WRIA 3 (lower river) Excluding Samish River System which is managed with Nooksack and WRIA 4 (upper river).

RM 42: Davis Slough

RM 45.6: Grandy Creek

RM 56.5: Baker River Trap

RM 67.2: Sauk River

RM 70.2: Barnaby Slough

RM 78.1: Cascade River – Marblemount Hatchery (at Clark Creek tributary site)

3.2 Regulatory and Policy Framework – Delete and address in Plan Outline only? Would the overall framework for Puget Sound vary from WRIA to WRIA?

3.3 Socio-political and economic environment

3.X.X Co-management responsible organization and individuals [from HGMP]

Indicate lead contact and on-site operations staff lead. RFP manager, Tribal contact, Hatchery Program manager, and facilities manager

Name (and title): Patrick Frazier, Region 4 Fish Program Manager

Ted Thygeson, Complex Manager

Agency: Washington Department of Fish and Wildlife

Address: 600 Capitol Way North, Olympia, WA 98501-1091

Telephone: (425) 775-1311 Ext 120 (360) 676-2138

Fax: (425) 338-1066 (360) 738-6291

Email: frazipaf@dfw.wa.gov thygetlt@dfw.wa.gov

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

Name (and title):

Tribe:

Address:

Telephone:

Fax:

Email:

3.3.2 Value of fisheries (possible application: SEPA “recreation” and “cultural preservation”

3.3.2.1 Importance to Tribal culture (statement from each co-manager listed above, probably to address Commercial, Ceremonial and Subsistence).

3.3.2.2 Economic value of Recreational fishery (two methods: 1: from SSP (US Census data); 2: using Director’s office figures – different handlings to indicate tourism, “trickle down”, WSR, C&R)

3.3.2.3 Cultural value of sport fishery?

3.4 Habitat Overview / Environmental Conditions (collect information for this watershed, to use only in a summary way in the RMP. This will indicate areas for Habitat Program to expand for use in eventual Recovery Plan development, and clearly show that these issues were not avoided or overlooked during RMP preparation.)

[Recovery Plan guideline questions]

3.4.1 Habitat conditions

What are the current and habitat conditions affecting the population?

What habitats are used at which life stages?

What Habitat Conservation Plans (HCPs) under Section 10 ESA, Section 7 consultations, FERC licenses and other long-term agreements affect steelhead populations?

What are your assumptions concerning ocean conditions, climate, harvest mortality and other factors that occur outside the watershed or ESU?

What have been/are the key habitat characteristics and processes that most affect (support or threaten) the viability (abundance, productivity, diversity, spatial structure) of each wild fish population?

What has been/are the effects of hydro dams or other major projects on the viability of wild fish?

SEPA “Earth, Air, Water, Plants, energy and natural resources, environmental health”

3.4.2 Species Interactions and Ecological Relationships

What other species interact with the population?

Which other fish or wildlife species directly or indirectly affect the ability of the species to thrive? How?

List of Habitat initiatives that affect or pertain to this watershed. (Name, Purpose, Area affected, Status (plan, proposed, finalized, approved, funded, active, etc), even if not targeted for steelhead specifically.

3.5 Fisheries **Fisheries and normal season dates**

Tribal: need to obtain summary or current dates

Sport: June 1 to March 15th (minimum 14”, daily limit 2, hatchery steelhead only)

Alternatives

- 1) Harvest special permits or random drawings
- 2) Variable “trigger levels” for allowable harvest types

3.5.1 Fishing gears

Alternatives 1) Fly fishing only gear
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3.5.2 Fishing areas

Alternatives 1) Special permits

Wild Management Zones (WMZs) proposed.

1. Baker River, Suiattle River, and draft proposal to convert Cascade River from segregated harvest to WMZ for winter steelhead.
2. All summer steelhead streams are to be WMZs.

Alternatives 1. For Columbia river DPSs, temperature refugia areas? (such as Drano Lake)

3.5.3 Sources of Incidental mortality (build a table to capture source and estimated loss?) Trying to get closer to actual runsize by including all harvest impacts.

Steelhead Release (non-retention; wild steelhead release)

Age- and Size-Selective Effects of Fishing

Net fisheries directed at other species

Ocean mortality

Overall Estimated Distribution of Fishing Mortality

Alternatives 1. Estimates of unrecorded harvest, poaching, net drop out and delayed mortalities.

3.6 Summary of factors supporting or threatening the viability of current populations. (this may not actually be the responsibility of the watershed people, but much of the information could be derived from the Template entries and District personnel may have good insights on many related issues or aspects). Any form of response, table, list or prose would be helpful – the actual compilation will have to be worked out.

4.0 Population Assessment [from SSP]

What are the key biological characteristics of steelhead?

What management complexities result from the unique biological characteristics of steelhead?

What is the current condition of the population?

What were the historical populations?

What are the current abundance, productivity/growth rate, diversity and spatial structure (i.e. Viable Salmon Population, or VSP, parameters) for each population?

How do they compare with the historical characteristics of the population?

4.1. Population Identification [from SaSI]

SaSI stocks

- Finney Creek Summer
- Sauk Summer
- Cascade Summer
- Mainstem Skagit /Tribs Winter
- Sauk Winter
- Cascade Winter

Hatchery stocks (Proposed for SaSI)

- MS Skagit/Tribs Winter (both Marblemount and Barnaby Slough)

4.3 Population Structure, origin and composition [from SSP]

What were the historical populations of Steelhead in Puget Sound [watershed]?

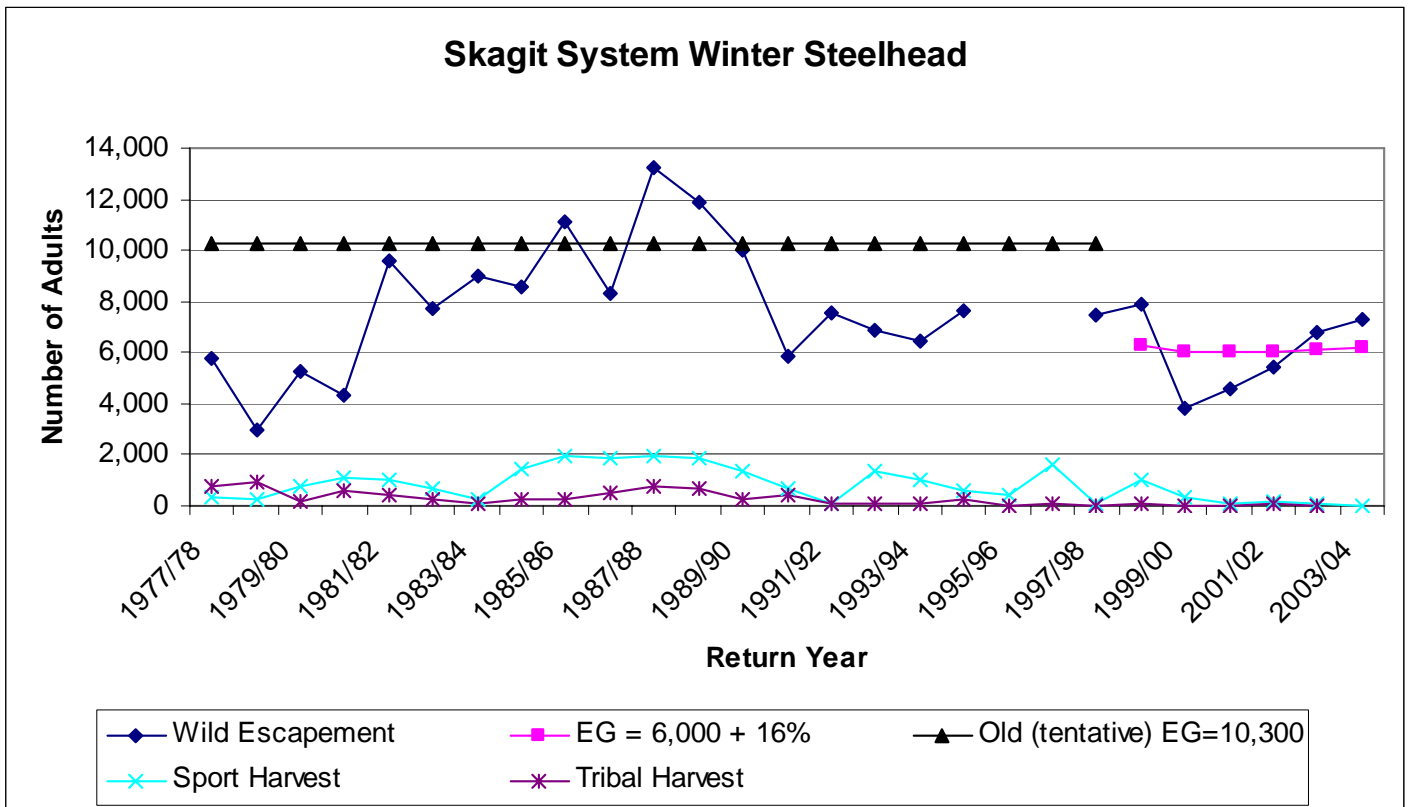
How have anthropogenic factors such as hatchery programs and habitat modifications affected population structure?

What is the source of broodstock for hatchery programs in each region? [From HGMP]

4.4 Abundance and Productivity [from SSP]

4.3.1 Trends in abundance and productivity by Population [from SSP]

What are the short-term and long-term trends in abundance and productivity of naturally-spawning populations of steelhead?



What have been the temporal trends in smolt-to-adult return rates and how have these trends affected population performance?

Skagit River System Hatchery Winter Steelhead (Samish River excluded)

Release	Release Yr	Return YR	Runsize	Escapement	Harvest	SAR	Exploitation*	Facilities
186,228	1976	1977/78	8,035	1,537	6,498	4.31%	81%	Whitehorse, Barnaby
358,839	1977	1978/79	9,585	961	8,624	2.67%	90%	Whitehorse, Barnaby, Puyallup, Lakewood, Skykomish Sportsmen
306,117	1978	1979/80	7,446	721	6,725	2.43%	90%	Skykomish Sportsmen, Whitehorse, Barnaby, Lakewood, Puyallup, Arlington
326,600	1979	1980/81	4,722	1,127	3,595	1.45%	76%	Skykomish Sportsmen, Whitehorse, Barnaby, Lakewood, Puyallup, Sauk Pond
329,964	1980	1981/82	4,683	735	3,948	1.42%	84%	Skykomish Sportsmen, Whitehorse, Barnaby, Sauk Pond
179,440	1981	1982/83	2,766	434	2,332	1.54%	84%	Skykomish Sportsmen, Barnaby, Bellingham, Lakewood
236,735	1982	1983/84	5,843	917	4,926	2.47%	84%	Whitehorse, Sauk Ponds, Bellingham, South Tacoma
237,248	1983	1984/85	13,185	3,702	9,483	5.56%	72%	Sauk Pd, Whitehorse, Bellingham, Lk Whatcom, Chambers Cr, Puyallup, Skykomish Sport.
258,257	1984	1985/86	8,529	1,339	7,190	3.30%	84%	Sauk Pd, Whitehorse, County Line Pd, Lakewood, Lk Whatcom, Marblemopunt, Puyallup
336,417	1985	1986/87	6,183	964	5,219	1.84%	84%	Sauk Pd, Whitehorse, Barnaby, Bel'h'm, Co Line, Lk'wood, Lk Whatcom, Marblem'nt, Puyallup
298,357	1986	1987/88	7,562	1,195	6,367	2.53%	84%	Whitehorse, Bellingham, Lk Whatcom, Puyallup
136,096	1987	1988/89	4,973	779	4,194	3.65%	84%	Skykomish Sport, Barnaby, Co Line, Harrison Pd, Puyallup
228,328	1988	1989/90	5,350	840	4,510	2.34%	84%	Skagit Sys COOP, Whitehorse, Barnaby
286,833	1989	1990/91	2,161	339	1,822	0.75%	84%	Whitehorse, Barnaby, Skagit Sys COOP
163,031	1990	1991/92	3,834	611	3,223	2.35%	84%	Skagit Sys COOP, Barnaby, County Line Pd, Sultan HS
213,492	1991	1992/93	2,930	460	2,470	1.37%	84%	Skagit Sys COOP, Whitehorse, Barnaby, Lakewood, Puyallup, Skykomish Sportsmen
167,374	1992	1993/94	916	143	773	0.55%	84%	Skagit Sys COOP, Whitehorse, Barnaby, Lakewood
364,161	1993	1994/95	2,427	496	1,931	0.67%	80%	Skykomish Sport, Whitehorse, Barnaby
366,591	1994	1995/96	1,959	392	1,567	0.53%	80%	Whitehorse, Barnaby
354,122	1995	1996/97	2,346	347	1,999	0.66%	85%	Marblemount, Whitehorse, Barnaby, Davis Slu Rearing Pd
323,048	1996	1997/98	935	449	486	0.29%	52%	Barnaby, Marblemount, Whitehorse
328,461	1997	1998/99	1,119	262	857	0.34%	77%	Barnaby, Marblemount, Whitehorse
562,675	1998	1999/00	844	96	748	0.15%	89%	Barnaby, Marblemount, Whitehorse
445,434	1999	2000/01	1,974	290	1,684	0.44%	85%	Barnaby, Marblemount, Whitehorse
501,221	2000	2001/02	3,550	427	3,123	0.71%	88%	Barnaby, Marblemount, Whitehorse
463,460	2001	2002/03	562	113	449	0.12%	80%	Barnaby, Marblemount, Whitehorse

*Tribal landings and sport harvest rates – incidental mortalities not estimated.

26-year averages: 4,401 757 3,644 1.71% 82%

1997/98 Emergency regulation closure.

Skagit River System Winter-run Steelhead

WRIA 03.0176

Skagit County

WDFW District 14, 16018 Mill Creek Blvd, Mill Creek 98012, (425) 775-1311

Example: Hatchery smolt releases during the spring of 1977 will produce the majority of adults returning for the 1978-79 winter and 1979 summer harvest seasons

1May-30Apr													Smolt	Revised: 04-12-06
Return Year (N)	Sport Harvest (1Nov-30Apr)			Tribal Harvest (1Nov-30Apr)			Escapement			Total Runsize			-May Release Return N+2	Comments
	Hatchery	Wild	H&W Total	Hatchery	Wild	H&W Total	Hatchery	Wild	H&W Total	Hatchery	Wild	H&W Total		
1960/61													95,933	System EG = 6,000 + 16%
1961/62			11,782										79,134	
1962/63			13,638										148,372	Samish River excluded from Skagit River System data
1963/64			22,216										101,002	
1964/65			13,324										560,831	Hatchery returns Dec and Jan; spawn mid-Jan
1965/66			16,699										418,162	Wild peak returns Mar and Apr for system
1966/67			16,830										257,440	Range: L. Oct - L. May for components
1967/68			20,392										215,543	Wild peak spawn Apr and May for system
1968/69			13,708										278,327	Range: E. Mar - M. Jul for components
1196/70			7,581										366,363	
1970/71			11,065										319,969	Segregated hatchery programs
1971/72			14,818										347,812	
1972/73			8,992										155,202	
1973/74			6,717			3,668							291,797	
1974/75			5,743			15,968							251,803	
1975/76			1,647			6,029							284,851	
1976/77			1,241			2,415							186,228	
1977/78	3,033	371	3,404	3,465	787	4,252	1,537	5,757	7,294	8,035	6,915	14,950	358,839	
1978/79	4,638	240	4,878	3,986	901	4,887	961	2,982	3,943	9,585	4,123	13,708	306,117	
1979/80	2,679	799	3,478	4,046	154	4,200	721	5,288	6,009	7,446	6,241	13,687	326,600	1 fish daily limit (select areas) in Mar.
1980/81	1,231	1,105	2,336	2,364	623	2,987	1,127	4,308	5,435	4,722	6,036	10,758	329,964	1 fish daily limit (select areas) in Mar.
1981/82	1,635	1,023	2,658	2,313	384	2,697	735	9,609	10,344	4,683	11,016	15,699	179,440	1 fish daily limit Mar, then C&R Apr. in select areas.
1982/83	632	666	1,298	1,700	281	1,981	434	7,732	8,166	2,766	8,679	11,445	236,735	1 fish daily limit (select areas) in Mar. Also April C&R
1983/84	1,698	296	1,994	3,228	79	3,307	917	8,963	9,880	5,843	9,338	15,181	237,248	WSR mid-Feb, 1 fish daily limit Mar, then C&R Apr.
1984/85	4,793	1,435	6,228	4,690	283	4,973	3,702	8,603	12,305	13,185	10,321	23,506	258,257	WSR mid-Feb, 1 fish daily limit Mar, then C&R Apr.
1985/86	2,525	1,916	4,441	4,665	233	4,898	1,339	11,098	12,437	8,529	13,247	21,776	336,417	
1986/87	1,689	1,852	3,541	3,530	536	4,066	964	8,305	9,269	6,183	10,693	16,876	298,357	Multiple brood years erratically from 1982 to 1992
1987/88	2,206	1,922	4,128	4,161	746	4,907	1,195	13,194	14,389	7,562	15,862	23,424	136,096	
1988/89	1,230	1,892	3,122	2,964	676	3,640	779	11,854	12,633	4,973	14,422	19,395	228,328	
1989/90	1,283	1,351	2,634	3,227	272	3,499	840	10,017	10,857	5,350	11,640	16,990	286,833	
1990/91	141	637	778	1,681	465	2,146	339	5,818	6,157	2,161	6,920	9,081	163,031	WSR Jan and Feb by E-Reg
1991/92	976	51	1,027	2,309	84	2,393	611	7,514	8,125	3,834	7,651	11,485	213,492	1992 SaSSI status "Healthy"
1992/93	1,721	1,318	3,039	749	46	795	460	6,900	7,360	2,930	8,264	11,194	167,374	
1993/94	600	1,052	1,652	173	74	247	143	6,412	6,555	916	7,538	8,454	364,161	
1994/95	987	561	1,548	944	271	1,215	496	7,656	8,152	2,427	8,488	10,915	366,591	
1995/96	1,040	455	1,495	527	22	549	392			1,959			354,122	No surveys - high flows
1996/97	1,839	1,609	3,448	160	73	233	347			2,346			323,048	No surveys - high flows
1997/98	347	49	396	139	22	161	449	7,448	7,897	935	7,519	8,454	328,461	
1998/99	561	1,030	1,591	296	46	342	262	7,870	8,132	1,119	8,946	10,065	562,675	EG 10,300 (tentative) revised downward
1999/00	497	361	858	251	39	290	96	3,780	3,876	844	4,180	5,024	445,434	
2000/01	1,572	53	1,625	112	18	130	290	4,584	4,874	1,974	4,655	6,629	501,221	WSR
2001/02	2,860	131	2,991	263	45	308	427	5,394	5,821	3,550	5,570	9,120	463,460	2002 SaSI status Depressed
2002/03	439	46	485	10	32	42	113	6,818	6,931	562	6,896	7,458	421,213	
2003/04	878	11	889			314	392	7,332	7,724				513,330	
2004/05	709+	6+	715+				358	6,175	6,533				529,821	
2005/06													466,100	Catch Record Card (CRC) reporting season change:
2006/07														Prior to 2000: 1 May to 30 April CRC year
2007/08														Year 2000: 1 May to 31 Mar CRC year
2008/09														2001 and on: 1 April to 31 March CRC year

Sport Harvest: Began 12 month CRC recording in 1962; Skagit system data had a 0.6 Bias Correction multiplier thru 75-76 season (P. Hahn, WDFW).

Hatchery Escapement: 1995-2005: Source is Adult_Tickets database for trapped less released for Marblemount and Barnaby.

Other Hatchery Releases: Steelhead releases into the Skagit System began in 1936 at Grandy Creek and the Skagit River (undifferentiated), data quality very erratic.

How has production potential of the population been affected by anthropogenic (human intervention) factors?
Paragraph on local insight or observation sought here.

Proposals and Alternatives

4.3.1.1 Spawner Abundance Estimation Methodologies

Proposals and Alternatives

4.3.2 Extinction Risk [from SSP]

4.4 Genetic Diversity and Spatial Structure [from SSP]

How have anthropogenic factors such as habitat modification, fishery management, and artificial production programs affected the diversity and spatial structure of steelhead populations?

Paragraph on local insight or observation sought here.

Proposals and Alternatives

What was the distribution of summer and winter steelhead in each watershed prior to European settlement?
[from SSP]

Do we attach a map here? [can modify from SSP - right now we just have the DPS map]

How has the range of summer and winter steelhead changed from the pre-settlement distribution? [from SSP]
What factors caused the change in distribution?

Paragraph on local insight or observation sought here.

Needs? More work? Prioritize (will be prioritized in the plan).

4.5 Biological Objectives

4.5.1 Conservation / Spawner Goals

What are the viability criteria, in terms of abundance, productivity, spatial distribution and genetic diversity?
What are the conservation objectives we will use to manage fisheries and gauge success of artificial production programs?

Alternatives
1. MSH based, but re-set EGs
2. MSR (recreation) – basically wild steelhead release [from Wild Steelhead Coalition paper]
3. A variation off of the Canadian system
4. Others? (allocation, harvest rates, etc)

4.5.2 Management Periods

Management is directed at steelhead during what temporal periods? (if relevant)

Alternatives

4.5.3 Key Population Management Recommendations

What is the relationship between population-scale goals and goals for the entire ESU/DPS?
What is the expected time frame and significant benchmarks for meeting the goals?
What are key considerations in measuring achievement of the goals?

5 Harvest Management

What strategies and tools are available to manage steelhead fisheries?

Alternatives

What changes, if any, must occur in management of harvest to contribute to population health?
How will changing harvest objectives influence artificial production?

5.1 Trends in Historic Catch, and Effort by population

What are trends in the catch and effort in steelhead fisheries? [from SSP]
Tables; short narrative if needed

5.2 Management Trade-offs [from SSP]

5.2.1 Treaty/Nontreaty Allocation/Sharing Principles

5.2.2 Balancing community needs

5.2.3 Etc. (SSP)

5.3 Abundance Forecasting and Season-Setting Processes

5.3.1 Pre-season Planning

Steps for Application of Management Objectives to Annual Fisheries Planning

5.3.1.1 Preseason Abundance estimation methods/model description

Alternatives

5.3.2 In-Season Management

Contingencies & regulation implementation

5.3.2.1 Under what circumstances would we modify fisheries?

Alternatives

5.3.2.2 How do we modify fisheries?

5.3.3 Post-Season Evaluation

How will the effectiveness of harvest actions be measured? What are the metrics? How will we report the outcomes?

5.4 Fishery Objectives and Distribution of Opportunity

What trade-offs are made (between science and socio-economic considerations) in choosing strategies?

5.4.1 Non-treaty (recreational) fisheries

5.4.2 Treaty fisheries

6 Type of hatchery program. [from HGMP]

Define as either: Integrated Recovery; Integrated Harvest; Isolated Recovery; or Isolated Harvest (see Attachment 1 - Definitions” section for guidance). 534,000 total planned

releases: 250,000 from Barnaby; Isolated harvest for Barnaby 284,000 from Marblemount Isolated harvest for Marblemount (from FBD 2006 draft)

6.1 Program Description [from HGMP]

6.1.1 Purpose (Goal) of the hatchery program.

Define as either: Augmentation, Mitigation, Restoration, Preservation/Conservation, or Research (for Columbia Basin programs, use NPPC document 99-15 for guidance in providing these definitions of “Purpose”). Provide a one-sentence statement of the goal of the program, consistent with the term selected and the response to Section 1.6. Example: “The goal of this program is the restoration of spring chinook salmon in the White River using the indigenous stock”.

The goal of the Marblemount program is release **334,000** steelhead smolts to provide steelhead for sport and tribal harvest opportunities (5,000 adults annually) and to have a self-sustaining hatchery run (400 adults; total for Marblemount and Barnaby Slough).

The goal of the Barnaby Slough program is release approximately **200,000**-winter steelhead to provide steelhead for sport and tribal harvest opportunities (5,000 adults annually) and to have a self-sustaining hatchery run (400 adults; total for Marblemount and Barnaby Slough).

Justification for the hatchery program. [from HGMP]

Indicate how the hatchery program will enhance or benefit the survival of the listed natural population (integrated or isolated recovery programs), or how the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish (integrated or isolated harvest programs).

Marblemount:

This hatchery program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Hatchery fish will be released as smolts at a time to minimize or eliminate adverse interactions with listed fish.
2. Fish will be acclimated before release.
3. Hatchery fish will be propagated using appropriate fish culture methods and consistent with the Co-Managers' Disease Policy, spawning and genetic guidelines and state and federal water quality standards.
4. Juvenile fish produced in excess to production goals will be dealt with appropriately such as by being planted in a lake without an outlet.

To minimize impacts on listed fish by WDFW facilities operation and the Marblemount steelhead program, the following Risk Aversions are included in this HGMP:

Barnaby:

This hatchery program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Hatchery fish will be released as smolts at a time to minimize or eliminate adverse interactions with listed fish.
2. Fish will be acclimated before release.
3. Hatchery fish will be propagated using appropriate fish culture methods and consistent with the Co-managers' Fish Health Policy and state and federal water quality standards, e.g. NPDES criteria.
4. Juvenile fish produced in excess to production goals will be dealt with appropriately such as by being planted in a lake without an outlet.

To minimize impacts on listed fish by WDFW facilities operation and the Barnaby Slough steelhead program, the following Risk Aversions are included in this HGMP:

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

- **For hatchery programs (from HGMP)**

Operational Information	Number
Annual operating cost (dollars)	\$351,149
The above information for annual operating cost applies cumulatively to the Marblemount Hatchery Fish Programs (including Marblemount Hatchery steelhead) and cannot be broken out specifically by program. Funding sources are General Fund – State, General Fund - Federal & Wildlife State – Local (Seattle City Light).	
Operational Information	Number
Annual operating cost (dollars)	\$351,149
The above information for annual operating cost applies cumulatively to the Marblemount Hatchery Fish Programs (including Barnaby Slough steelhead) and cannot be broken out specifically by program. Funding sources are General Fund – State, General Fund - Federal & Wildlife State – Local (Seattle City Light).	

Additional funding source information Make table with in-place and proposed?

- **For Harvest activity (enforcement, outreach and education, etc.**
- **For monitoring activity: General Fund, Wildlife Fund (?)**
- **For habitat recovery: Shared Strategy (?)**

Table 1. Summary of risk aversion measures for the Marblemount steelhead program.

Potential Hazard	HGMP Reference	Risk Aversion Measures
Water Withdrawal	4.2	Usage of surface water at Marblemount Hatchery is regulated through trust water right permit # S1-20241. Water used in the hatchery is routed back to the creek immediately below the hatchery.
Intake Screening	4.2	The intake at Marblemount hatchery does not comply with current NOAA requirements. However, all intake screens are 1" x .125" mesh and are in compliance with state and federal guidelines (NMFS 1995,1996). No chinook are passed above Clark Creek. Jordan Creek is utilized only from May through September.
Effluent Discharge	4.2	Effluent from the Marblemount Hatchery is regulated through NPDES permit # WAG 13-3015.
Broodstock Collection & Adult Passage 6.1.3	2.2.3, 7.9	Winter steelhead voluntarily enter an off-channel trap in a time period (late December to March) when chinook are unlikely to be present.
Disease Transmission 6.2.4	9.2.7	The program is operated consistent with the co-manager's Fish Health Policy (1998).
Predation & Competition 6.2.3	2.2.3, 10.11	Fish are released at a time, size, and life-history stage (smolts) to foster rapid migration to marine waters. Trucking of smolts from out-of-basin (Whitehorse Ponds) rearing location for release into the Skagit River basin have been eliminated. Smolts are released in May to allow chinook to grow to a size that reduces the potential for predation. Studies are/will be conducted in riverine, estuarine, and nearshore areas to evaluate the ecological risks posed by the release of steelhead smolts.

6.1.4 Program background [from WTG files]

Table of historic artificial production programs; levels; broodstock

6.1.5 Current production Program [from FBD]

6.2 Biological Considerations

How has/do current artificial production programs and facilities support steelhead populations/stocks/groups?
How has/do current artificial production programs and facilities affect the viability of wild fish?

6.2.1 Survival

What has been the survival rate of the juveniles released? **Move table in 4.3.1 to here?**

6.2.2 Genetic Effects [from SSP]

What is the fitness (or adult-to-adult survival) of naturally-spawning steelhead of hatchery origin relative to the indigenous population?

What are the potential genetic and ecological effects of artificial production on natural populations?

6.2.3 Competition and predation

6.2.4 Operational Considerations / Facility Effects

How does hatchery effluent or the release of diseased fish affect the prevalence or severity of disease in natural populations?

6.3 Artificial Production Actions and Effects

What changes, if any, to hatchery programs and facilities are necessary to support recovery?

How will those changes affect harvest (and habitat)?

How will the effectiveness of the action be measured?

How can hatchery supplementation programs support or threaten recovery?

How can/does mass marking support or threaten recovery?

6.3.1 HSRG Facility Recommendations

6.3.2 Wild Management Zones

6.3.3 Other Recommendations

6.3.4 Action Plan

Priorities, schedule, estimated costs (i.e. operational and capital facilities planning)

7 Plan Implementation

7.3 population Monitoring

7.3.1 Spawning ground survey methodologies

7.3.2 Operational survey plans

7.3.3 Biological sampling goals

How many scales or genetic samples need to be taken in order to provide meaningful information? In fisheries? From hatcheries? From spawning grounds?

7.4 Artificial Production Monitoring

7.4.1 Escapement Estimation methodologies

7.4.2 Survival estimation

7.4.3 Disease?

What else? **Risk Management?**

List of hatchery program “Performance Standards”. (from HGMP)

“Performance Standards” are designed to achieve the program goal/purpose, and are generally measurable, realistic, and time specific. The NPPC “Artificial Production Review” document attached with the instructions for completing the HGMP presents a

Example: “ (1) Conserve the genetic and life history diversity of Upper Columbia River spring chinook populations through a 12 year duration captive broodstock program; (2) Augment, restore and create viable naturally spawning populations using supplementation and reintroduction strategies; (3) Provide fish to satisfy legally mandated harvest in a manner which minimizes the risk of adverse effects to listed wild populations; (4)....”.

list of draft “Performance Standards” as examples of standards that could be applied for a hatchery program. If an ESU-wide hatchery plan including your hatchery program is available, use the performance standard list already compiled.

See section 1.10. (From both HGMPs)

List of hatchery program “Performance Indicators”, designated by "benefits" and "risks." (from HGMP)

7.5 Adaptive Management – other information.

The tribal goal for hatchery winter steelhead is to harvest 5,000 adults commercially. This goal is not being achieved. The non-tribal goals are to have a self-sustaining hatchery run of 400 adults. This equates to a ~1% return on total smolt releases into watershed (534,000 smolts).

Winter steelhead escapement levels in the Skagit River for hatchery and wild for return years 1995 through 2005 were the following: (can add more years or just refer to the Historical Database sheet)

Return year	Hatchery	Wild	Total
1993/1994	143	6,412	6,555
1994/1995	496	7,656	8,152

1995/1996	392	No surveys-high flow	
1996/1997	347	No surveys-high flow	
1997/1998	449	7,448	7,897
1998/1999	262	7,870	8,132
1999/2000	96	3,780	3,876
2000/2001	290	4,584	4,874
2001/2002	427	5,394	5,821
2002/2003	113	6,818	6,931
2003/2004	392	7,332	7,724
2004/2005	358	6,175	6,533

Source: W. T. Gill, WDFW historical steelhead database.

Date hatchery program started (years in operation), or is expected to start. Include a summary statement of pre-1960 hatchery release activity. (From Historical Database sheets).

Barnaby 1961; Marblemount 1995.

First record of hatchery steelhead releases into the Skagit System was in 1936.

Harvest program history. Can make winter steelhead total harvest graphs back to 1961 for sport and 1973 for Tribal.

Include Harvest regulation history (sport and Tribal) as available. E-reg responses to triggers and the results obtained? (Obtain fill-in regulation history data later?)

Include wild escapement goal re-evaluations and changes (or dual co-manager goals). This will require an explanation for the 10,300 (Tribal not agreed to) tentative revision down to 6,000 plus 16% of escapement over 6,000 in 1999.

Indicate alternative actions considered for attaining hatchery program goals, and reasons why those actions are not being proposed. (from HGMP and HSRG)

Alternative 1: Maintain current segregated program levels and enhance monitoring of the wild populations.

Alternative 2: Increase separation of segregated stocks from wild populations to prevent genetic introgression. Develop an acclimation pond site downstream of Rockport where spawning habitat is extremely rare or downgraded due to bank engineering. Re-establish focus on earlier egg take protocols.

Alternative 3: Decrease size of segregated programs to reduce associated impacts to wild populations. Would require enhanced monitoring and establishment of baselines to justify the anticipated loss of sport and tribal harvest.

Alternative 4: Increase size of segregated programs to enhance harvest opportunity. This

would probably conflict with ESA requirements to protect listed Chinook (and steelhead?) juveniles.

Alternative 5: Eliminate the segregated harvest programs to significantly reduce potential interaction with the natural populations and eliminate impacts on ESA listed species. This alternative is not considered acceptable as the programs currently support a popular sport and Tribal fishery.

Alternative 6: Eliminate the non-local program and use the native stock for new programs at one of both of these facilities. Marblemount would possibly have a higher priority than Barnaby due to its upstream location. WDFW is currently conducting a research project on the Kalama River that will provide information on the feasibility of using the native population. This alternative would require utilizing local stock, and better information is needed on the status of the wild populations. A particular issue may be the difficulty in reliably producing a viable one-year smolt in a system that favors two, or even three-year smolts naturally. Accurate HOS/NOR ratios would be needed to evaluate program success and would require installation of a weir (problematic with a river this size) or increased ground based (as opposed to current flyover) monitoring of spawning grounds, and/or establishment of good index zones. Additionally, change to integrated programs would probably reduce harvest opportunity in terms of abundance and possibly season timing, particularly during the earlier (Tribal accustomed) harvest period, since that benefit of the early returning Chambers Cr stock would be lost.

Indicate alternative actions considered for type of fishery (C&R, WSR, WMZ, fly only, etc).

FURTHER DEVELOP THE CONSERVATION STRATEGY GOAL TABLES (CURRENT, SHORT-TERM AND LONG-TERM) FOR BOTH THE HATCHERY AND WILD STOCK STATUS (BIOLOGICAL SIGNIFICANCE AND VIABILITY), HABITAT AND HARVEST
Changes in levels from current status would indicate expected outcome for the hatchery program and other conservation strategies. (This idea came from the table placeholder in the Elochoman HGMP – and is still under development according to K. Keoun)