

Puget Sound Steelhead Advisory Group (PSSAG) Meeting Notes

April 24, 2017, 12AM – 7PM

Lynnwood Embassy Suites, 20610 44th Ave West, Lynnwood, Washington, 98036

Drafted by Cole Caldwell and James Scott (May 22, 2017)

Key Messages to Stakeholders Agreed at Meeting Conclusion

- Puget Sound steelhead are at about 5% of historical abundance.
- We have a big and complex challenge to conserve steelhead and provide sustainable fisheries.
- We received three in-depth presentations:
 - Jeff Hard, NOAA, Viability Criteria, Status, and Recovery Planning
 - Brian Missildine, HSRG and WDFW, Steelhead Hatchery Overview
 - Ken Warheit, WDFW, Potential Ecological and Genetic Risks of Hatchery Programs
- We are systematically evaluating this information in preparation for developing watershed-specific strategies.

Agenda Items discussed at the meeting:

1) Introduction

2) Review Draft Mission

- Have we captured the Mission?

3) Review Draft Sideboards

- Do we agree on the sideboards?

4) Review Draft Ground Rules

- Do we agree on the ground rules?

5) Foundational Information

- a) *Steelhead Biology* – What do we know? What distinguishes steelhead? What is the status of Puget Sound steelhead? What are the primary stressors?
- b) *Hatcheries Programs* – What are the potential purposes of hatchery programs? What are the types or strategies of hatchery programs? What are key terms used in describing hatchery programs? What are the current hatchery programs in Puget Sound?
- c) *Risks of Hatchery Programs* – What are the potential ecological and genetic risks of hatchery programs? What are the estimates of gene flow for Puget Sound hatchery programs?
- d) *Recreational Fisheries* – What has been the recreational fishery catch? What is the estimated economic value of the fishery? How have angler preferences changed through time? What are the interactions between hatchery programs and fisheries?

6) Review Draft Objectives

- Have we captured the objectives (“Success is...”) discussed at our previous meeting?
- Given the additional information provided today, are any changes needed in the draft objectives?

7) Schedule & Process

- Discuss longer term schedule

8) External Messages

- What are the 3-5 messages regarding this meeting that we want to provide to other interested stakeholder

9) Public Comment

10) Thoughts on Meeting

Advisors Attending

Al Senyohl

Rich Simms

Jonathan Stumpf

Rob Masonis

Andy Marks

Roger Goodan
Curt Kraemer
David Yamashita
Jamie Glasgow
Derek Day
Curt Wilson
Mark Spada

Public Attending

Conrad Gowell
Jeff Martin
Nick Chambers
Lauren Bruns

Staff Attending

Jim Scott (co-facilitator), Cole Caldwell (co-facilitator)
Brett Barkdull
Edward Eleazer
Annette Hoffmann
Brian Missildine
Ken Warheit
Jennifer Whitney

Notes from the first meeting per agenda item:

- **Introduction and Group Member Feedback/Ideas**
 - There was a request to provide name tags or cards for all members. This would help members to learn names, facilitate who is speaking, ask questions, determine when someone is finished speaking, and gauge conversation length.
 - There was a request to add to the PSSAG binder:
 - a list of names and titles of all group members;
 - key paper abstracts and a bibliography;
 - a list and definitions of acronyms.

- **Mission Statement Review**
 - The group agreed to the following change to the draft mission statement, “The PSSAG mission is to “Develop a broadly supported vision with forward-looking watershed-specific strategies that provides for conservation and recovery of steelhead and a diversity of sustainable recreational fishing opportunities across the rivers of Puget Sound.”
 - The group agreed that the Mission Statement may need to be modified as the PSSAG process develops.
 - The group determined that the Mission Statement should be broad and that the Objectives should be specific.
 - There was a discussion regarding whether the mission statement should include language about determining which rivers could be considered a gene pool river. There was a concern that the group may be trying to avoid the term “gene bank”. RESOLUTION: It was determined that this concern was likely too specific for the mission statement and that this issue will be covered by strategies outlined in Objective #8.
 - There was a discussion regarding whether the mission statement should include clarification on who the PSSAG represents (e.g. fisherman, the species, business, etc.). It was decided that this would be discussed further in association with the Objectives.
 - There was a discussion regarding whether the mission statement should consider defining the words “forward-looking”. This was determined to be defining the scale the PSSAG will be working with and would be discussed further as specific watersheds are discussed.

- There was a discussion about if the mission statement should consider defining the words “recreational”. The group decided that this term should be included in the mission statement.
- **Sideboards Review**
 - The group agreed that the Sideboards needed additional work.
 - The group suggested changing the title of the Sideboards theme to, “Legal and Policy Considerations for Fishery and Artificial Production Strategies” and removing the verbs at the start of each bullet. This reflects an interest in pursuing new approaches and the potential flexibility in some current policies.
 - The group suggested recognizing general resource constraints (e.g. field staff limitations) in the Sideboards.
 - The group discussed the advantages and disadvantages of referencing the Strategies and Actions of the Statewide Steelhead Management Plan, but decided to keep Sideboard #3 with the addition of the word “considerations” in the title and introductory sentence.
 - The group suggested adding a Sideboard to the list that includes consideration of the implications of strategies that will require new resources.
- **Ground Rules Review**
 - The group suggested that the facilitator ask for consensus on decisions or ideas. This effort could help to identify differences and capture mutual consensus.
 - The group would like results of Ground Rule #7 (Key Messages) to be posted on the web page so that group members can direct key individuals/organizations to the information. Key messages should include and highlight: major messages, critical issues, and group accomplishments.
 - Ground Rule #8 (Decision Process) will be addressed by the group as it develops watershed-specific strategies.
 - It was suggested that the group consider removing Ground Rules 1d, 2b, 3a, and 4d as they were not necessary. No consensus was reached on this matter.
 - Ground Rule #2 may need to include “Avoid side conversations” or “Only one conversation at a time”.
 - The group suggested added another Ground Rule. The rule would be to turn cell phones off.
- **Foundational Information Review**
 - All power point presentations are available on the advisory group web page.
 - *Key points from Jeff Hard presentation on “Viability criteria, status, and recovery planning for Puget Sound steelhead”*
 - Puget Sound steelhead abundance is <5% of the historical level, many populations are small and continuing to decline, natural productivities are generally below replacement, status of many populations including nearly all summer run populations is uncertain, declining smolt-to-adult returns (SARs) are pervasive throughout the Salish Sea since the 1980s (slide 3).
 - The Technical Recovery Team (TRT) identified:
 - 3 Major Population Groups (MPGs) consisting of populations in the Northern Cascades, Central & South Puget Sound, and Hood Canal/Strait of Juan de Fuca regions (slide 17); and
 - 32 historical populations (slide 17).
 - The TRT used a Bayesian Network to assess the viability of populations, MPGs, and the Puget Sound DPS. This decision support tool (slide 24):
 - explicitly incorporates uncertainty;
 - can include almost any relevant variable; and
 - provides a transparent, systematic way to assist decision-making or evaluate alternatives.

- Based on an assessment of abundance, productivity, diversity, and spatial structure, the TRT estimated a 1% probability that the DPS is viable (slide 32), with the following estimates of viability for each MPG:
 - 36% Northern Cascades (slide 30)
 - 17% Central & South Puget Sound (slide 30)
 - 16% Hood Canal/Strait of Juan de Fuca (slide 30)
 - Viability criteria include (slides 33, 34):
 - consideration of abundance, productivity, diversity, and spatial structure – or viable salmonid population (VSP) characteristics;
 - all MPGs must be viable;
 - $\geq 40\%$ of the constituent populations of each life history type (winter- and summer-run) must be viable in each MPG.
 - The 2015 Status Review found little change in abundance since the last review in 2011 (slide 36);
 - about half of the populations have an abundance of fewer than 500 adults (slide 37);
 - if current conditions continue, most populations in Puget Sound are expected to remain stable or decline further (slide 43);
 - the geometric mean abundance increased by 5.4% from 2010-2014 relative to 2005-2009 (slide 37);
 - hatchery assessment - most populations in the DPS are composed largely of natural spawners, and this fraction has increased to near 100% since the 2005-2009 period (slide 40); and
 - harvest assessment - terminal exploitation rates have been substantially reduced, with an average rate of about 2% (down from rates of 10%-60% through the late 1980s)(slide 41).
 - NOAA Fisheries anticipates completing a recovery plan by 2019 (slide 44);
 - Key analyses include:
 - identification of pressures (e.g., residential development) and stressors (e.g., fragmented or degraded habitat, limited use of suitable habitat, altered hydrographs, and low early marine survival) (slides 45, 47); and
 - life cycle modeling to identify bottlenecks (early marine survival, low rates of repeat spawning, limited smolt capacity and rearing habitat in some systems) and develop recovery goals (slides 50, 51).
 - Next steps include (slide 52):
 - determining delisting criteria and recovery goals;
 - developing recovery scenarios; and
 - drafting the recovery plan (strategy and actions, time and cost, relation to other plans, implementation, and Research, Monitoring, and Evaluation).
- *Advisory Group Discussion of Hard Presentation*
 - The overall status of Puget Sound steelhead is bleak – about a 1% probability that the DPS is viable.
 - Spatial structure and diversity are important components of determining viability.
 - There are many factors affecting viability and no magic bullet to solve the recovery issue. Multiple actions need to be coordinated and used to get to viability.
 - The PSSAG needs to look at new dials to support the recovery of Puget Sound steelhead.
 - Marine survival is key for viability and recovery.
 - There is high uncertainty in the data.
 - The Elwha provides a good example of the benefits of opening habitat to recolonization.
 - Large-scale experiments may prove valuable for watersheds in the long term given the amount of uncertainty.

- The PSSAG can influence how and where harvest and hatcheries will influence populations and watersheds.
 - The PSSAG has no influence on early marine survival, natural predation, competition, climate change, or habitat decisions, but can use the data from these factors to guide decisions.
 - This Bayes Network approach could be a useful tool for the PSSAG to evaluate strategies.
 - This tool should be used and compared to hatchery information, genetic information, and all identified Sideboards during the decision making process.
- *Key points from Brian Missildine presentation on “Steelhead Hatchery Overview”*
 - Two primary purposes of hatcheries are to provide fish for harvest (Harvest Program) and to contribute to natural populations (Conservation Program) (slide 5).
 - There are two general hatchery strategies (slide 6):
 - The intent of a segregated program is to create a hatchery-adapted population genetically distinct from the natural populations. For a Primary population, the intent is to have a gene flow of $\leq 2\%$ (slide 7). A segregated program may be an appropriate strategy when:
 - very low probability of hatchery fish spawning with natural populations;
 - mitigation programs where spawning habitat no longer exists;
 - where smolt release and adult collection facilities are physically separated from natural spawning areas.
 - Integrated program incorporate natural-origin fish in the hatchery broodstock with the intent that natural selection in the wild drives the fitness of the population as a whole (slide 9). For a primary population, the intent is to have the Proportionate Natural Influence (PNI) ≥ 0.67 and the Proportion of Hatchery- Origin Spawners in natural spawning areas (pHOS) ≤ 0.30 (slide 10).
 - Key points for segregated and integrated programs are:
 - must be able to ID hatchery- and natural-origin fish in broodstock and on spawning grounds;
 - program sizes must be matched to productivity and capacity of natural environment;
 - must be able to control numbers of hatchery fish spawning naturally; and
 - both strategies represent trade-offs.
 - There are 14 steelhead hatchery programs in Puget Sound tributaries, with 9 programs operated to provide harvest benefits and 5 operated to provide conservation or research benefits.
- *Advisory Group Discussion of Missildine Presentation*
 - Hatchery terms and definitions should be provided to the group.
- *Key points from Ken Warheit presentation on “Potential Ecological and Genetic Risks of Hatchery Programs”*
 - Potential ecological interactions include competition for food and space, predator attraction, predator buffering, and predation (slide 4).
 - Low probability of competition of food or space, or direct predation, from juveniles in freshwater (slide 6).
 - Potential for competition of spawning sites, but spawning for segregated hatchery-origin and wild population are largely separated in time (slide 6).
 - Potential for density dependent effects (e.g., Kostow and Zhou analysis of NF Clackamas R.) (slide 6).
 - Domestication is the cultivating or taming of a population or organisms in order to accentuate traits that are desirable to the cultivator or tamer. Examples include early maturation, rapid juvenile development, and early spawn timing (slide 11).

- Early-generation hatchery fish average only half the reproductive success of their wild-origin counterparts when spawning in the wild (Christie paper “On the reproductive success of early-generation hatchery fish in the wild”)(slide 14);
 - Genes may be “expressed” in the hatchery environment in response to crowded hatchery conditions. However, these results say nothing about how these changes may affect fitness in the wild, or if they are reversible in the wild (Christie paper “A single generation of domestication heritably alters the expression of hundreds of genes”)(slide 15).
 - Wild population productivity may decline if wild and hatchery-origin individuals spawner together, creating “hybrid” offspring of lower fitness (slide 16)
 - Gene flow is the rate at which genes from a hatchery population are incorporated into a wild population (slide 19).
 - A measure of gene flow is the Proportion Effective Hatchery Contribution (PEHC), or the proportion of the parental population that is of hatchery-origin (slide 21).
 - Estimates of PEHC for past early winter hatchery programs ranged from 0% to 8%, and 0% to 96% for past early summer programs (slide 24).
 - Current genetic work is identifying the specific chromosomes that are important to the survival and diversity of wild fish.
- *Advisory Group Discussion of Warheit Presentation*
 - A key question that should be asked prior to initiating or evaluating a hatchery program is “Why have the program?”
 - With a segregated program the allowable level of genetic interaction is small (2% gene flow for Primary population), and larger rates of gene flow could result in a large loss of fitness for the wild population.
 - Even with wild broodstock programs, studies have found that returning adults from the hatchery program may produce fewer adults in the subsequent generation than wild fish.
- *Agenda item 5(d) (Recreational Fisheries)* was not covered and will be added as an agenda item for the next meeting in May.
- **Draft Objectives Review**
 - It was agreed upon that everyone in the group would review the draft objectives and provide comments for discussion at the upcoming May meeting.
- **Schedule and Process Review**
 - All weekday meetings will occur from 1200-1900
 - All weekend meeting will occur from 0930-1630
 - Meetings will occur in two week intervals
 - May 25th will be the next PSSAG meeting
 - Meetings will generally occur at the Lynnwood Embassy Suites, St. Helens Room 20610 44th Ave West, Lynnwood, Washington, 98036
 - At least 11 people should be in attendance at every meeting
- **External Messages Discussion**
 - Puget Sound steelhead are at about 5% of historical abundance.
 - We have a big and complex challenge to conserve steelhead and provide sustainable fisheries.
 - We received three in-depth presentations:
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- We are systematically evaluating this information in preparation for developing watershed-specific strategies.
- **Thoughts on Meeting**
 - It would be helpful to frame up the key questions by watershed prior to the initiation of advisory group discussions of objectives and strategies.
 - There is no single smoking gun.
 - The group has the ability to help shape population designations (e.g., Primary, Contributing, stabilizing) for the recovery plan.
 - The group wants to “crosswalk” management information with the information from the available science/presentations.
 - It would be helpful to summarize the key points from each watershed (have the presenters review the summary to ensure that it is accurate and important points are not missed).
 - Trust in each other and in the process.
 - Remember the value of fish that are not caught.
 - Provide the reading list well in advance of the meeting.
 - Leave plenty of time for questions after the presentations.
 - Invite presenters and other experts to attend the meetings.
 - Be flexible in making Saturday’s available for meetings.