

FISH AND WILDLIFE COMMISSION POLICY DECISION

POLICY TITLE: Anadromous Salmon and Steelhead Hatchery Policy

POLICY NUMBER: C-3624

Effective Date: TBD

Supersedes: Policy C-3619 Adopted November 5, 2009

See Also:

Approved by:

Washington Fish and Wildlife Commission

Purpose

The purpose of the Anadromous Salmon and Steelhead Hatchery Policy (Policy) is to guide hatcheries and their individual rearing programs to advance the conservation and recovery of wild salmon and steelhead by implementing hatchery reform measures; to perpetuate salmon and steelhead in accordance with existing mitigation programs and agreements for permanently lost or impaired habitat; and to provide sustainable economic and stability benefits to recreational, commercial and tribal fisheries in Washington State as appropriate.

Authority Definition and Intent

This Policy is applicable to hatcheries operated by the Washington Department of Fish and Wildlife (Department) with programs for anadromous salmon and steelhead. The intent of this Policy is to provide direction, goals, and objectives to improve hatchery effectiveness and ensure compatibility between hatchery salmon and steelhead production and wild salmon and steelhead conservation and recovery in a manner that optimally achieves the stated purpose of this Policy.

General Policy Statement

The Department shall operate salmon and steelhead hatchery facilities in a manner that optimally achieves the three tenants of the Policy's purpose statement. The highest priority policy commitment shall be the conservation of natural resources, including the conservation and recovery of depressed coincident wild salmon and steelhead populations, the maintenance or recovery of wild salmon and steelhead life history diversity, the maintenance of wild populations currently in a healthy condition, the conservation of genetic resources found in hatchery populations, and providing critical ecological benefits such as prey to endangered Southern Resident Orca (SRO) and marine nutrient re-cycling. Hatchery programs shall also have the policy directive to safely perpetuate salmon and steelhead resources to support sustainable fisheries that are managed to achieve

conservation goals for wild stocks, and to support reintroduction of salmon and steelhead above currently blocked habitat where feasible, thereby providing important socio-cultural benefits and satisfying legal obligations. The Policy purpose shall be accomplished by establishing clear goals for each hatchery program, conducting scientifically defensible operations, and using a well-informed monitoring and evaluation program to make adaptive changes to achieve hatchery program goals.

Hatchery programs are to be implemented as part of an “all-H” strategy that integrates hatchery, harvest, hydropower and habitat actions and allows for the recovery of depressed wild populations consistent with the federal Endangered Species Act (ESA). Although this Policy focuses on hatchery operations, in no way does it diminish the significance of habitat protection and restoration, nor does it replace or reduce the need for full restoration of currently damaged or impaired habitat. Hatchery programs should not detract from efforts to protect and rehabilitate currently damaged salmon or steelhead habitat capable of being improved for the benefit of both wild and hatchery salmon and steelhead. This Policy is also not intended to alter current harvest management policies, goals or strategies that pursue and implement mark-selective fishing on hatchery propagated salmon and steelhead.

Hatchery programs will be designated as one of the following in accordance with its primary purpose:

- Conservation Programs. Conservation hatchery programs are implemented with a conservation objective to achieve a net aggregate benefit for the diversity, spatial structure, productivity, and abundance of one or more depressed target wild salmon or steelhead populations that are in need of rebuilding or recovery to carrying capacity abundance.
- Mitigation Programs. Mitigation hatchery programs are implemented in accordance with existing agreements and programs to produce salmon or steelhead to offset adverse impacts from projects or events associated with permanently lost or impaired salmon or steelhead habitat.
- Fishery Supplementation Programs. Fishery supplementation hatchery programs are implemented with an objective to provide supplemental fishery benefits while allowing watershed-specific goals for the diversity, spatial structure, productivity, and abundance of coincident wild populations to be met.

It is recognized that there may be hatchery program initiatives that may serve more than one designation category. A hatchery program with a primary conservation goal of providing additional prey to endangered SRO and a secondary objective of providing incidental fishery benefits to existing fisheries is an example of such a hatchery program initiative; another example is hatchery production with a primary mitigation goal of producing a number of fish from inundated and blocked habitat behind a dam built without fish ladders and a secondary conservation objective of supporting successful reintroduction to salmon and steelhead to their historic habitat above reservoirs created by the dam

Salmon and steelhead released into the wild from many state operated hatcheries are subject to Treaty-reserved Indian fishing rights. The Department shall manage hatchery programs in a manner that is consistent with *U.S. v. Washington*, *U.S. v. Oregon*, and other applicable state or federal laws or State-Tribal fishery management agreements. The

Department shall maintain a strong Tribal Co-Manager working relationship with affected Tribes that is characterized by open and frequent communication, full consideration of scientific and policy perspectives, and a cooperative approach to decision-making on salmon and steelhead hatchery program matters that directly affect Treaty-reserved fishing rights. This State Policy is not to be considered a Tribal Co-Manager-agreed joint policy agreement, an element of Tribal fishing rights case law, or a component of the Puget Sound Salmon Management Plan.

Upon adoption of this Policy by the Commission, the Director is tasked to begin development of a joint policy agreement on salmon and steelhead hatchery programs with Tribal Co-Managers that has similar development and joint commitment provisions to those in "The Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State." This Hatchery Policy serves as the State's interim guidance until a joint policy agreement is developed with Puget Sound, Coastal, or Columbia River Tribal Co-Managers. When completed and approved by Tribal Co-Managers and the Commission, new Tribal Co-Manager joint policy agreements shall supersede the provisions of this Policy in the geographic area applicable to the particular agreement.

Policy Guidelines

The Department shall apply the following policy guidelines in managing salmon and steelhead hatcheries to promote achievement of the purpose of this Policy.

1. It is recognized that there can be significant genetic risks to wild salmon and steelhead populations that accompany the operation of a salmon or steelhead hatchery program. Genetic risks can include direct negative effects from the interbreeding of hatchery-origin propagated salmon and steelhead with wild salmon and steelhead, such as reduction in genetic diversity or fitness, and indirect effects that may result in genetic selection, such as disease transmission, competition, or predation. Genetic risks shall be minimized in accordance with the provisions of Hatchery Management Plans (HMP) developed under Policy Guideline 4.
2. It is recognized that there can be significant ecological risks to wild salmon and steelhead populations that accompany the operation of a salmon or steelhead hatchery program. Ecological risks include such effects as direct or induced predation, competition, disease transmission, and hatchery facility effects. Ecological risks shall be minimized in accordance with the provisions of HMPs developed under Policy Guideline 4.
3. It is recognized there can be many benefits from well-managed hatchery programs that propagate salmon or steelhead. Production from hatcheries can boost the recovery of depressed wild populations; maintain important genetic traits of salmon and steelhead; aid in reintroducing and re-establishing natural production above blocked habitat; provide ecosystem services such as marine nutrient transfer and Southern Resident Killer Whale support; and support sustainable fisheries. Benefits

shall be provided in accordance with the provisions of HMPs developed under Policy Guideline 4.

4. An HMP shall be developed for every anadromous salmon and steelhead hatchery program under the authority of this Policy and each hatchery program shall operate in accordance with the provisions of its HMP. Each HMP shall be based on the best available science on the risks of hatchery production on wild salmon and steelhead and contain the essential elements of operational planning that will control aspects such as broodstock collection, mating protocols, and juvenile rearing and release strategies. See Appendix 1 to this Policy document with a 2020 prototype HMP table of contents as a contemporary example. HMP provisions are to reflect a balance between minimizing genetic and ecological risks to coincident wild populations and providing for the ecological and societal benefits of hatchery propagated salmon and steelhead.

Balance will be achieved through a structured decision-making process. This process makes use of a science-based risk management framework to quantitatively address risks and benefits of hatchery production and incorporates uncertainty in the estimates of the risks and benefits. Hatchery production will be adaptively managed through a monitoring and evaluation program that attempts to reduce uncertainty, updates assumptions, and, if needed, modifies hatchery goals. An example of a structured decision-making process is shown in Figure 1. The details of this process will be included in a technical procedures document to be developed in consultation with Tribal Co-Managers after this Policy has been adopted. The technical procedures document will be subjected to an environmental review separate from an environmental review of this Policy. HMPs will be developed after the completion and approval of the technical procedures document and will be based on the structured decision-making process described in that document. The Director shall strive to complete the technical procedures document within one year following the adoption of this Policy and provide the Commission with periodic briefings on its content as it is developed. The HMPs should be completed within five years following the adoption of this Policy.

HMP development shall begin with hatchery programs that may potentially affect populations listed under the ESA and have had Hatchery Genetic Management Plans (HGMPs) approved by the National Marine Fisheries Service at the time this Policy is adopted. These HMPs shall be completed prior to the development of all other HMPs. The highest priority to be completed are HMPs associated with the Southern Resident Orca (SRO) prey initiative (see Policy Guideline 6).

The Director shall approve new HMPs that are consistent with the provisions of this Policy and compliant with science-based risk management framework and structured decision-making processes described in the technical procedures document when it is completed. Until the HMPs are prepared and approved in accordance with this Policy, existing hatchery operational plans, goals and objectives in effect on June 14, 2018 shall remain intact as current policy direction, except as modified in accordance with watershed specific policies or initiatives adopted or modified by the Commission since

that date, such as the Columbia River Salmon Fishery Management Policy, the Willapa Bay Salmon Fishery Management Policy, and the 2018 SRO prey initiative.

5. It is the intent of this policy that hatchery production levels are based on the deliberative, transparent, and science-based process to be described in the technical procedures document discussed in Policy Guideline 4. As a result of this deliberative process, there may be increases in hatchery production and there may be decreases in hatchery production. See Figure 1 caption for an example.
6. Hatchery programs associated with the Southern Resident Orca (SRO) Prey Initiative shall have high priority. Following the Governor's Executive Order of March 2018 calling for measures to benefit SRO, the Commission adopted an initiative for approximately 50 million additional chinook smolts from hatchery programs in Puget Sound and the Columbia River for a primary purpose of providing more preferred prey for SRO. Subsequently, the final report of the Governor's SRO Task stated in Recommendation 6: "Significantly increase hatchery production and programs to benefit SROs consistent with sustainable fisheries and stock management, available habitat, recovery plans and the Endangered Species Act. Hatchery increases need to be done in concert with significantly increased habitat protection and restoration measures." The Director shall consult with Tribal Co-Managers and work with the National Marine Fisheries Service to develop an implementation plan for the SRO prey initiative. Hatchery production increases resulting from this initiative are to use suitable genetic strains and be appropriately located and sized to effectively provide prey to endangered SROs in concert with recovery plans for threatened wild salmon and steelhead.
7. All chinook, coho, and steelhead propagated in hatcheries shall be externally marked, except:
 - a. as modified by state-tribal agreements;
 - b. for conservation or other management purposes; or
 - c. to fulfill other research needs.
8. The Department shall strive to secure necessary funding to ensure that Department-operated hatchery facilities:
 - a. comply with environmental regulations for hatchery operations, including passage facilities, water intake screening, and pollutant and disease control systems; and
 - b. achieve the administrative necessities of this Policy.
9. A special, high level of protection from possible negative effects of hatchery programs to wild populations shall be provided to those wild populations that have not had substantial genetic modification from past hatchery practices, are now in a healthy condition with little or no same species/run hatchery influence and exist in relatively high-quality habitat enabling natural selection to climate change. The intent of this policy guideline is to provide an elevated level of protection to the relatively few populations that meet this premium status so as to prevent negative coincident

hatchery-related impacts; there is no policy intent in this policy guideline to detract from or diminish conservation measures in place for ESA-listed or other salmon and steelhead populations. The Department shall seek funding for a process to identify such populations. The Commission shall approve any proposed populations associated with this Policy Guideline. The approval process shall include consultation with appropriate Tribal Co-Managers in an open, transparent, public input process.

10. The Department shall plan for and implement an expanded use of methods to separate hatchery and natural origin salmon and steelhead below natural spawning grounds where scientifically justified, logistically feasible, and agreed to with area-specific Tribal Co-Managers. These methods shall include various weir designs, alternative methods that are less intrusive than weirs, and emerging technology. Expanded use of such methods are to be included in the annual update to the Commission described below.

Adaptive Management

The Commission recognizes that there is considerable uncertainty in the how and when the implementation of the policy will secure the benefits from achieving its stated purpose. In addition to the uncertainty of various scientific estimates of the negative effects of genetic and ecological risks and estimates of the positive ecological and fishery benefits, it is also recognized that there are likely to be unpredictable near-term fluctuations in environmental factors that affect salmon and steelhead abundance, including changes in short-term environmental patterns, long-term climate change, possible environmental disasters, and management implementation processes. Therefore, the Commission acknowledges that adaptive management procedures will be essential to achieve the purpose of this Policy. Therefore, the technical procedures document described in Guideline 4 above must include an adaptive management component. In addition, the Department will track policy implementation and provide the Commission with annual written reports updating progress. If the policy purpose, guidelines, directives, and hatchery program specific goals are not being achieved, efforts will be made to determine why and to identify actions necessary to correct course.

It is important to align the purposes, goals, and objectives of this Policy, and any changes resulting from implementing its provisions, with state and federally adopted recovery and rebuilding plans. Recognizing the authority of the federal government in federal ESA implementation, the Department shall meet with the appropriate federal representatives to promote consideration of ESA compliance for any hatchery production changes associated with implementing this Policy. The Department shall also meet with the Governor's Salmon Recovery Office and individual Salmon Recovery Boards to discuss the dynamic and adaptive nature of recovery planning and the best way to reach population recovery targets identified in contemporary salmon and steelhead recovery plans while also integrating any changes in hatchery programs as result of implementing this Policy. The Department shall include Tribal Co-Managers in all such efforts to coalesce salmon recovery policy implementation processes in areas of regional Tribal Co-Manager authority.

Appendix 1. Prototype Example of a Table of Contents to a Hatchery Management Plan for a Washington State Hatchery Program.

EXECUTIVE SUMMARY

SECTION 1. GENERAL PROGRAM DESCRIPTION

- 1.1 Name of hatchery or program.
- 1.2 Species and population (or stock) under propagation, and ESA status.
- 1.3 Responsible organization and individuals
- 1.4 Funding source, staffing level, and annual hatchery program operational costs.
- 1.5 Location(s) of hatchery and associated facilities.
- 1.6 Type of program.
- 1.7 Purpose (Goal) of program.
- 1.8 Justification for the program.
- 1.9 List of program "Performance Standards".
- 1.10 List of program "Performance Indicators", designated by "benefits" and "risks."
- 1.11 Expected size of program.
- 1.12 Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.
- 1.13 Date program started (years in operation), or is expected to start.
- 1.14 Expected duration of program.
- 1.15 Watersheds targeted by program.
- 1.16 Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

SECTION 2. PROGRAM EFFECTS ON FEDERAL ESA-LISTED SALMONID POPULATIONS AND NON-LISTED WILD SALMONID POPULATIONS. (USFWS ESA-Listed Salmonid Species and Non-Salmonid Species are addressed in Addendum A)

- 2.1 List all ESA permits or authorizations in hand for the hatchery program.
- 2.2 Provide descriptions, status, and projected take actions and levels for NMFS ESA-listed natural populations in the target area, as well as viable non-listed wild populations as appropriate.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

- 3.1 Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. Hood Canal Summer Chum Conservation Initiative) or other regionally accepted policies (e.g. the NPPC Annual Production Review Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.
- 3.2 List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, agency policies, or other management plans or court orders under which program operates.
- 3.3 Relationship to harvest objectives.
- 3.4 Relationship to habitat protection and recovery strategies.
- 3.5 Ecological interactions.
- 3.6 Relationship to existing state and federal adopted recovery plans and regional sustainability plans for wild salmon and steelhead, and associated goals, objectives, targets,

measures, and actions.

Explain any proposed deviations from the plan(s).

SECTION 4. WATER SOURCE

4.1 Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

4.2 Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

SECTION 5. FACILITIES

5.1 Broodstock collection facilities (or methods).

5.2 Fish transportation equipment (description of pen, tank truck, or container used).

5.3 Broodstock holding and spawning facilities.

5.4 Incubation facilities.

5.5 Rearing facilities.

5.6 Acclimation/release facilities.

5.7 Describe operational difficulties or disasters that led to significant fish mortality.

5.8 Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

6.1 Source.

6.2 Supporting information.

6.3 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

SECTION 7. BROODSTOCK COLLECTION

7.1 Life-history stage to be collected (adults, eggs, or juveniles).

7.2 Collection or sampling design.

7.3 Identity.

7.4 Proposed number to be collected:

7.5 Disposition of hatchery-origin fish collected in surplus of broodstock needs. 7.6 Fish transportation and holding methods.

7.7 Describe fish health maintenance and sanitation procedures applied.

7.8 Disposition of carcasses.

7.9 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

SECTION 8. MATING

8.1 Selection method.

8.2 Males.

8.3 Fertilization.

8.4 Cryopreserved gametes.

8.5 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

SECTION 9. INCUBATION AND REARING -Specify any management goals (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1 Incubation:

9.2 Rearing:

SECTION 10. RELEASE

10.1 Proposed fish release levels.

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

10.3 Actual numbers and sizes of fish released by age class through the program. 10.4

Actual dates of release and description of release protocols.

10.5 Fish transportation procedures, if applicable.

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

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

10.8 Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

10.9 Fish health certification procedures applied pre-release.

10.10 Emergency release procedures in response to flooding or water system failure.

10.11 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

SECTION 11. MONITORING AND EVALUATION

11.1 Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.2 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish and unlisted wild populations resulting from monitoring and evaluation activities.

11.3 Risk management/assessment framework and mechanism for adaptive management designed to achieve the specific goals of the programs based on the monitoring and evaluation program.

SECTION 12. RESEARCH

12.1 Objective or purpose.

12.2 Cooperating and funding agencies.

12.3 Principle investigator or project supervisor and staff.

12.4 Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5 Techniques: include capture methods, drugs, samples collected, tags applied.

12.6 Dates or time period in which research activity occurs.

12.7 Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8 Expected type and effects of take and potential for injury or mortality.

12.9 Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table

- 1).
- 12.10 Alternative methods to achieve project objectives.
- 12.11 List species similar or related to the threatened species; provide number and causes of mortality related to this research project.
- 12.12 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY ADDENDUM A. PROGRAM EFFECTS ON OTHER (AQUATIC OR TERRESTRIAL) ESA-LISTED POPULATIONS. (Anadromous salmonid effects are addressed in Section 2).

- 15.1 List all ESA permits or authorizations for USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species associated with the hatchery program.
 - 15.2 Describe USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species and habitat that may be affected by hatchery program.
 - 15.3 Analyze effects.
 - 15.4 Actions taken to minimize potential effects.
 - 15.5 References
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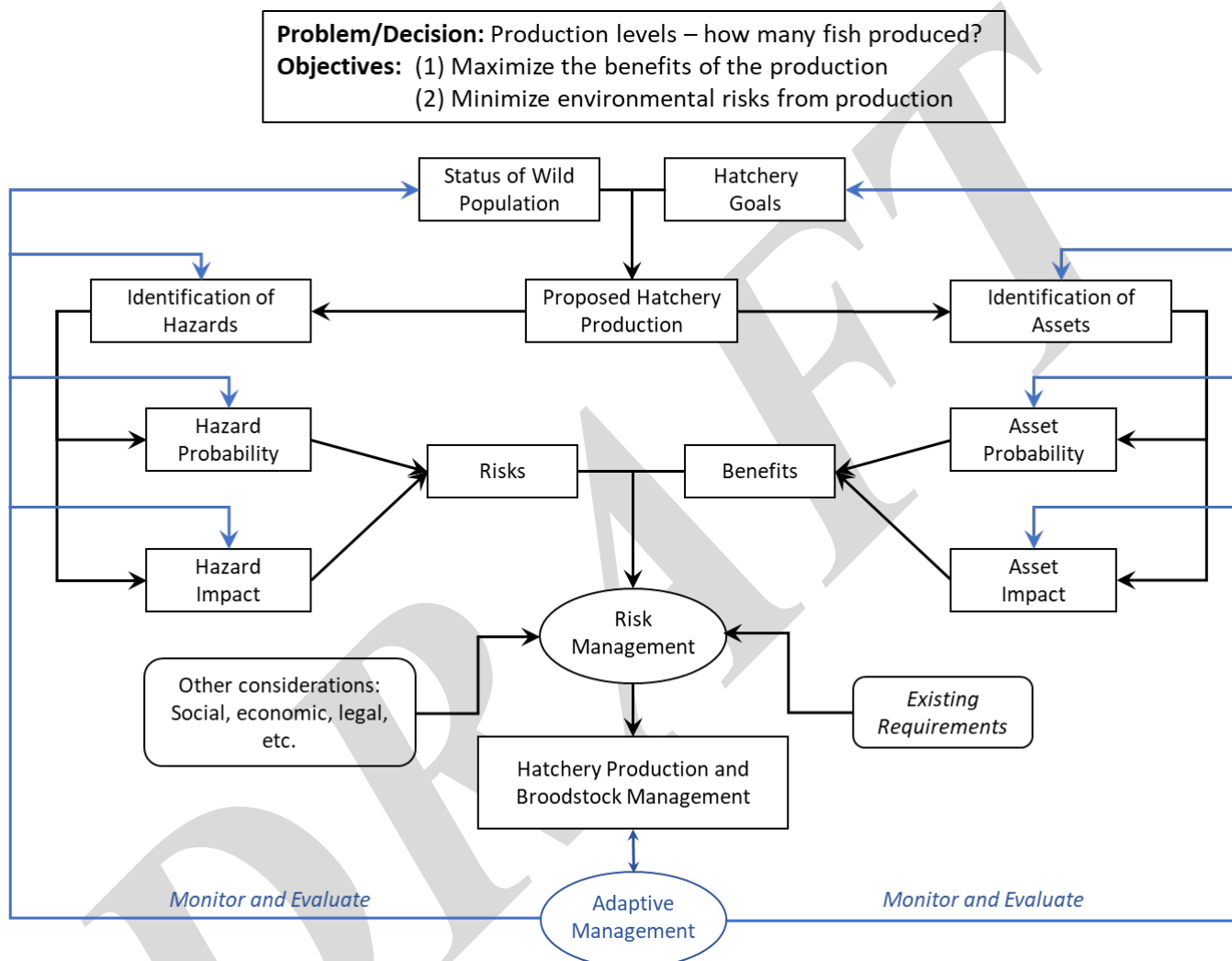


Figure 1. An example of a structured decision-making process for hatchery production, using two directed acyclic graphs or flow diagrams. This process is designed to provide the tools to make production-level decisions at salmon and steelhead hatcheries. The fish produced from each hatchery can be considered an asset when they provide benefits (e.g., harvestable fish) or a hazard when they become environmental risks (e.g., reduce fitness of wild populations). There are two fundamental objectives to this process: (1) maximize benefits from hatchery production, and (2) minimize risk to the maintenance or recovery of wild populations from hatchery production. The first graph, denoted by black arrows, represents the risk management process, and starts with a hatchery facility, with explicit goals, and wild population(s). The status of the wild population includes its ESA listing, recovery plans (if they exist), and any demographic, ecological, or genetic data relevant to the population's viability. The status of the wild population and goals of the hatchery are used to

determine an initial or proposed hatchery production. The proposed production is then filtered through a quantitative and objective benefit and risk assessment, and subjective risk management process. Asset or hazard probability is the likelihood that the asset or hazard will occur, and their impact is the extent to which they result in a positive or negative effect, respectively. Risk or benefit can be thought of as a combination of the hazard's or asset's probability and impact, respectively. Risk and benefit assessments are generally science-based processes. The risk management process may include nonscience-based factors, such as social, economic, legal, or political considerations. Production levels may be set *a priori* by existing requirements. The second graph, denoted by blue arrows, flows in the opposite direction and represents the adaptive management process. Data are collected and evaluated on all components associated with the risk management process and may be used directly to change production levels and broodstock management, or indirectly through an improved understanding of the status of the wild population or by adjustments to the goals of the hatchery. Adaptive management may also decrease uncertainty associated with hazard or asset probabilities and impacts. As an example, using this Figure as a model, the Department proposes to increase production from a facility. The risks and benefits from the proposed hatchery production would be evaluated. Hazards would be assessed relative to the status of the affected wild populations and include the potential effects of hatchery-origin fish spawning naturally. Assets would include potential increases in harvest opportunities. Where possible, benefits and risks will be quantified, and compared to desired/legal outcomes such as limits to the number of hatchery fish spawning naturally, or minimum production levels legally required. Once the risk and benefits assessments are completed the Director, or designee, will consider the assessments, relative to existing production requirements, and social, economic, political, legal, and other mitigating factors. The Director, or designee would then approve or disapprove the production increase. Regardless of the decision, a broodstock management plan designed to minimize potential risks will be established or renewed. If an increase in production is approved, the adaptive management process will evaluate that increase to determine if the increase resulted in a larger than expected negative effect to the wild populations. If not, the increased production is maintained. Otherwise, production is decreased to the previously accepted level. This process should allow for the appropriate sizing of hatchery production, given the status of the affected wild populations, constraints from risks, opportunities from benefits, existing legal requirements, and different levels of risk tolerance associated with different environmental, social, economic, or political conditions.