Northwest Power and Conservation Council

June 7, 2005

MEMORANDUM

TO: Council Members

FROM: Bruce Suzumoto

SUBJECT: APRE report to Congress

Attached is the draft Artificial Production Review and Evaluation report to Congress. Staff is seeking Council approval to finalize and send the report. The report to Congress will be sent in conjunction with final APRE Basin-Level Report (Council Document 2004-17). At the Council meeting, staff will discuss the contents of the Congressional report and proposed recommendations.

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Northwest Power and Conservation Council

DRAFT

June 7, 2005

Artificial Production Review and Evaluation
Report to Congress

I. Background

In 1997, Congress requested that the Northwest Power and Conservation Council (at the time the Northwest Power Planning Council) review all federally funded hatchery programs in the Columbia River Basin and recommend a set of coordinated policies to guide the future use of artificial production.[1] Congress perceived a multitude of problems and suspected that the artificial production system was not fulfilling its purposes. The nature and extent of the problems needed to be determined so that they could be addressed.

In response to the Congressional request the Council formed a scientific review team and initiated the Artificial Production Review (APR) and the Artificial Production Review and Evaluation (APRE). The 1999 APR report to Congress (Council Document 99-15)[2] established policies to guide the use of artificial production and recommended that a review of hatchery operations be initiated for the Columbia Basin. Using policies and recommendations from the APR report, the APRE process completed a comprehensive review of hatchery program purposes, operations and performance. The findings of the review are summarized in the 2004 APRE Basin-Level Report (Council Document 2004-17)[3]. In all, the Council's efforts resulted in an in-depth review of existing hatchery programs, identification of hatchery program changes, definition of the future role of hatcheries in the basin, and recommendations for policies to coordinate hatchery programs with other salmonid restoration efforts.

II. Summary of Recommendations

[1] Senate Report 105-44, accompanying the FY 1998 Energy and Water Development Appropriations Bill, S. 1004, pp. 117-118

[2] Artificial Production Review, Northwest Power and Conservation Council Document 99-17.

[3] Artificial Production Review and Evaluation Final Basin-Level Report, Northwest Power and Conservation Council Document 2004-17.

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As part of a comprehensive effort to improve artificial production in the Columbia Basin, the Northwest Power and Conservation Council recommends that federal fish and wildlife agencies work with the Council, the Bonneville Power Administration, state fish and wildlife agencies and tribes to accomplish the following tasks:

- Consistent with basinwide goals and priorities, establish long-term management objectives for hatchery and wild stocks that describe measurable contributions to harvest and conservation

- Identify hatchery programs as either being integrated with wild stocks or segregated from wild stocks and articulate how each program will contribute to long-term management objectives

- Implement essential hatchery reforms that align with the basinwide goals and management objectives, prioritized in a manner that considers potential biological benefits and cost-effectiveness

- In a publicly transparent fashion, monitor, review and report progress toward accomplishing long-term management objectives for each hatchery and wild stock. The Council should annually report to Congress on progress toward hatchery reform in the Columbia Basin.

III. Current Status of Hatcheries: The Artificial Production Review and Evaluation

The Council began with the APR. With the help of the Independent Scientific Advisory Board (ISAB), the APR conducted a scientific review of the state of artificial production within the basin and produced a set of guidelines for hatchery practices, ecological interactions and genetics (Council Document 99-4)[4]. The APR also engaged regional stakeholders and hatchery operators in a series of workshops where hatchery reform recommendations and policies were discussed and developed. At the end of the process, the APR concluded that guidance was needed to determine whether and where to use artificial production in each subbasin. The decisions should be implemented as a part of a "broader strategy to meet regional fish recovery goals," according to the review.

While the APR concluded that an updated and comprehensive hatchery policy framework was needed, it also recognized that significant changes would be possible only after a deliberate and thorough examination of the artificial production system. This evaluation was completed in the second phase of the Council's response to Congress: the APRE. The APRE examined 227 salmonid hatchery programs within the United States portion of the basin. The yearlong process was the most comprehensive effort ever undertaken to assemble basic data and information about all hatchery programs releasing fish into the Columbia River Basin. The APRE reviewed each program's stated purpose, evaluated how well the program met its intended objectives, and

[4] Review of Artificial Production of Anadromous and Resident Fish in the Columbia Basin, A Scientific Basis for Columbia River Production Programs, Northwest Power and Conservation Council Document 99-4

outlined potential risks in operating the program. The information then was compiled into provincial and basinwide overviews of artificial production.

In order to assure that the value of the work was preserved, the APRE developed an interactive, web-accessible database (http://www.nwcouncil.org/fw/apre). The database is flexible and to allows easy review and updates as new information becomes available or as hatchery programs change. It is expected that the database will save time and money in the future. Hatchery information is now organized in a consistent, accessible format and has been used in a collaborative development of Hatchery Genetic Management Plans (HGMP). A link to HGMP reports can be found on the APRE website.

The website contains data for more than 500 fish stocks in the basin. The database captures some of the most essential elements of artificial production programs and allows individual programs to be evaluated with respect to their objectives. The arrangement by subbasin allows for a greater understanding of interactions between hatchery and wild fish within watersheds. The APRE database is easily accessible so that managers can correct, update, and document information in a secure format.

The APRE arrived at several broad conclusions:

- Hatcheries are limited in what they can accomplish.

- The social, economic, and ecological purposes on which the current hatchery programs were established have changed and will continue to change.

- Hatcheries will continue to play a part in recovery and management of fish in the Columbia River and elsewhere.

- Hatcheries require reform to align their policies and practices with current social priorities and scientific knowledge, to determine hatchery performance and to operate in a cost-effective fashion.[5]

The APR and APRE demonstrated that artificial production programs need to be viewed in a new way. Many of the basin's hatchery programs were developed decades ago under a different set of needs, social conditions and mandates. For example, most of today's hatchery production remains focused on producing fish for out-of-basin and mainstem harvest. While these remain legitimate goals, they need to be better balanced with current priorities. More recently, conservation of the environment, ecosystems and species has become an important national and local priority.

In recent years many efforts have been made by hatchery operators to improve and update their programs to meet current conservation objectives. These efforts have included implementing a variety of operational changes and facility modifications. While this work should be applauded, much more needs to be done. Again, one of the greatest challenges to artificial production reform is that most hatchery programs were created under mandates and policies that stress

[5] From Artificial Production Review and Evaluation Final Basin-Level Report, Northwest Power and Conservation Council Document 2004-17.

different priorities than exist today. In many cases this has produced a conflict of objectives and ineffective attempts to solve the problems that arise.

IV. Council Recommendations

A. New paradigm for hatchery operations

Consistent with the APR and APRE, the Council believes that a new paradigm for hatcheries must be established, a paradigm in which the diversity of species and populations is emphasized and local needs are considered. In this paradigm, salmonid populations would be returned as closely as possible to their historic range, distribution and diversity through a variety of means including habitat protection, restoration and the appropriate use of hatcheries. Also in this paradigm, hatcheries would have a role in the future as part of an integrated strategy to meet conservation and harvest goals on a sustainable basis.

Salmonid populations can be aided through a variety of strategies including restoration of habitat, adjustments to the operation of the hydroelectric system, and changes in harvest limits, methods and seasons. While each of these strategies can improve the diversity, range and sustainability of salmonids, all are limited pragmatically in what they can accomplish. The difference between what these strategies could accomplish and the restoration goal will need to be made up by compatible artificial production programs. It should be noted, however, that all positive changes made in the areas of habitat, hydropower, and harvest will benefit hatchery fish as well as wild fish. Hatchery fish, like wild fish, need suitable habitat when released into the wild and need to be able to return to the basin in sufficient numbers to sustain the populations. Therefore, hatcheries cannot be viewed as a substitute for degraded habitat, for inappropriate harvest or for continued fish passage problems.

Hatchery plans must be part of and consistent with subbasin plans, the Endangered Species Act (ESA), and National Environmental Policy Act (NEPA) plans and requirements. Hatchery plans must be appropriate at all geographic levels within the basin: subbasin, province, evolutionarily significant unit (ESU) and the basin as a whole. In addition, the plans must be part of a comprehensive fish and wildlife program that identifies strategies and timeframes for meeting goals and expectations for stock recovery and harvest.

By their nature, hatcheries are compromises. The benefits accrued from artificial production must be balanced with risks to wild stocks and the environment when compared to alternative means of achieving the same or similar goals. In order to minimize risks, hatcheries must be consistent with ecological and genetic principles. Finally, hatchery programs must be flexible, responding in a timely fashion to changes in social, cultural and ecological needs as well as to changes in scientific knowledge.

B. Recommendations for improving artificial production in the Columbia Basin

Recommendation: Consistent with basinwide goals and priorities, establish long-term management objectives for hatchery and wild stocks that describe measurable contributions to harvest and conservation.

The Council currently is helping to clarify measurable goals and objectives for fish and wildlife in the Columbia basin. Basinwide goals and measurable objectives for fish conservation and harvest must be articulated clearly to help determine the proper role of artificial production. Hatcheries then can be incorporated into strategies to reach conservation and harvest goals. The Council's 2000 Columbia River Basin Fish and Wildlife Program calls for hatchery programs to be consistent with its vision (Council Document 2000-19)[6] and NOAA Fisheries' recovery goals.

An important finding of the APRE was that most basin hatchery programs lacked measurable objectives for two of their primary purposes — providing for harvest and contributing to natural escapement. Most programs had a variety of operational goals such as numbers of fish released, number of eggs taken or in-hatchery survival objectives, but many did not state how many returning adults were designated for harvest or how many adults were intended to spawn naturally. Without this information it is difficult to assess how well a particular program is performing or meeting its stated purpose. Columbia basin hatchery programs must establish measurable long-term management objectives for the stocks they produce and describe how they will contribute to the harvest and conservation of fish populations.

Recommendation: Identify hatchery programs as either being integrated with wild stocks or segregated from wild stocks and articulate how each program will contribute to long-term management objectives.

Hatchery programs should be designed and operated in a manner consistent with goals for natural stocks. This will require that each hatchery program, depending upon its intended purpose, be designated as either integrated with or segregated from naturally spawning populations. All operations and facilities must be compatible with the needs of the type of program selected to achieve the goals and objectives.

Segregated and integrated programs are operated very differently and are used to obtain quite different results. A segregated program is used when the "intent is for the hatchery population to represent a distinct population that is reproductively isolated from naturally spawning populations." [7] The purpose of this type of program is to minimize interaction between hatchery and wild populations and to create a "new, hatchery-adapted population to meet goals for harvest or other purposes" such as research or education. A segregated hatchery population is intended to have little or no genetic influence on wild fish populations.

Integrated programs, on the other hand, are intended to produce fish whose adaptation and fitness are driven by the natural environment. The goal of an integrated program is to "manage the hatchery population as an integral, benign component" of a population containing both hatchery and natural fish and to demographically increase the abundance of the fish within the natural population.[8] An integrated program obtains fish from a specified natural population, limiting its

[6] The vision statement reads: *The vision for this program is a Columbia River ecosystem that sustains an abundant, productive and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing benefits from fish and wildlife valued by the people of the region. This ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act.*

[7] From the HSRG/WDFW/NWIFC Technical Discussion Paper #2: Segregated Hatchery Programs, June 3, 2004

[8] From the HSRG/WDFW/NWIFC Technical Discussion Paper #1: Integrated Hatchery Programs, June 3, 2004

genetic material to that population. Few hatchery programs at this time are operating under the management guidelines for integrated programs, though it appears that integrated programs have great potential for producing fish with which to restore depleted populations within the basin.

Many fish and wildlife agencies and tribes are now emphasizing the need to operate hatchery programs in a manner consistent with the goals for natural stocks. NOAA Fisheries, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and the Yakama and Colville Tribes have been leaders in supporting a process to clarify objectives and better integrate hatchery programs with wild stocks. This process needs to continue and expand to all hatchery programs in the basin.

Recommendation: Implement essential hatchery reforms that align with the basinwide goals and management objectives, prioritized in a manner that considers potential biological benefits and cost-effectiveness.

Once management objectives for hatchery programs are clearly established, hatchery reforms must be promptly implemented. An action plan must be developed, and short- and long-term priorities identified. The action plan and priorities must balance achievement of harvest and conservation goals and the reduction of risk to natural populations. The implementation phase should encourage hatchery operators to take actions that are consistent with the Council's fish and wildlife program, are aligned with subbasin plans, and that contribute to the recovery goals established by NOAA Fisheries for threatened and endangered species.

Prioritizing hatchery reforms should be tied closely to achieving management objectives, cost-effectiveness, certainty of biological benefits, and which populations are in the greatest need. Initial actions could emphasize improving hatchery broodstocks and their relationship to natural spawning populations. A logical first step may be to target immediate hatchery reforms that could affect the most at-risk natural populations.

It will be very important to this effort to develop a protocol to allow communication between fish and wildlife managers and subbasin planning groups. With such a protocol in place, subbasin planning groups would be able to communicate their goals and objectives to hatchery co-managers and, in return, would learn how hatcheries can be integrated into subbasin plans to achieve subbasin goals.

Recommendation: In a publicly transparent fashion, monitor, review and report progress toward accomplishing long-term management objectives for each hatchery and wild stock. The Council should annually report to Congress on progress toward hatchery reform in the Columbia Basin.

A results-oriented, performance-based management system must be established to evaluate hatchery operations and their results in comparison with established goals and objectives. As part of this system, periodic hatchery reviews should be conducted to evaluate progress toward meeting management objectives as well as to assess operational risks to natural populations. These reviews will help identify where program changes are needed and how they can be implemented.

A review panel could be established to aid the evaluation and re-alignment efforts for each hatchery. The panel could include scientists, hatchery managers, agency and tribal representatives and funding entities. Representatives of the panel would attend the periodic reviews to provide advice, contribute to the applicable reports, identify research needs and ensure review consistency across the basin.

An Internet-based system should be developed to aid in evaluating goals and objectives and determining needed changes in hatchery programs. The system should be designed to efficiently and effectively disseminate data and information needed for the review process and to generate reports, including HGMPs. Data and information must be available to all interested parties and linked to existing regional databases. The system would result in more efficient record keeping and would assure that data and information is current, timely and accessible. Planners and managers could communicate with one another as well as with the public, contributing to transparency and encouraging public involvement.

The findings of these hatchery assessments will help inform future project implementation decisions for projects paid for by the Bonneville Power Administration and other funding sources. As part of the implementation and reform effort, the Council should annually report to Congress on accomplishments toward improvement of hatchery operations in the Columbia Basin.

V. The Council's Current Activities on Hatchery Reform

As noted above, the first step in integrating hatcheries into a basinwide comprehensive plan is to define regional goals and measurable objectives for conservation, harvest and the role of artificial production. In collaboration with other regional entities, the Council is initiating a process that will help clarify salmon and steelhead population objectives at the subbasin, provincial and basinwide levels. This effort will integrate the effects of artificial production, habitat, harvest and hydropower, and derive how far current and proposed activities can go toward meeting regional objectives. The exercise will rely on the APRE report, subbasin plans and other sources as the basis for estimating current and future results. The primary products of the exercise will be numerical estimates of how many and what type of salmon and steelhead adults will escape to the spawning grounds, be harvested and return to hatcheries.

The Council will use the results of the process to help develop biological objectives at the provincial and basinwide levels. Following an amendment process, the Council will adopt the biological objectives into its fish and wildlife program. Once adopted, measurable biological objectives will assist in determining when and how hatchery programs will be implemented.

The Council is developing an Internet-based information system to facilitate communication, disseminate information and promote accountability. The system will receive input from hatchery, habitat, harvest and hydropower data sets to inform how actions will assist in meeting regional objectives. The information system will promote transparency of hatchery activities and help monitor hatchery reforms as they are implemented. In addition to the information system, the Council is helping to develop decision support tools to that will utilize the system to assist policy and technical discussions.

The Council's current activities aim to support future hatchery reform activities. Using the clarified objectives for hatcheries and the integrated information system as a starting point, the Council will work with the federal agencies, fish and wildlife co-managers and regional stakeholders to implement report recommendations.

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