Northwest Power and Conservation Council

November 8, 2004

MEMORANDUM

TO: Fish and Wildlife Committee

FROM: Bruce Suzumoto

SUBJECT: APRE report to Congress

Attached are the draft APRE report to Congress and the final basinwide APRE report. Staff will discuss the findings and recommendations of the draft and seek committee ideas on the most effective use and release of the report.

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851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Steve Crow
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

Report to Congress on Artificial Production

within the

Columbia River Basin

I. Introduction

In 1997, Congress requested that the Northwest Power and Conservation Council (formerly the Northwest Power and Planning Council) review all federally funded hatchery programs in the Columbia River Basin and develop a set of coordinated policies to guide the future use of artificial production. Congress perceived that a multitude of problems affected the artificial production "system" in the Basin and suspected that the system was not fulfilling its purposes. The nature and extent of the problems needed to be determined so that ways to "fix" the system could be designed and implemented.

Subsequent to the Congressional request, a variety of efforts were undertaken, including formation of a scientific review team in addition to institution of the Artificial Production Review and the Artificial Production Review and Evaluation (Section II). These efforts have resulted in a review of existing hatchery programs, identification of hatchery program changes, definition of the future role of hatcheries in the Basin, and recommendations for implementation of hatchery program changes which will allow artificial production to be coordinated with other salmonid restoration efforts.

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

The Council's response to the request from Congress began with the Artificial Production Review (APR). With the help of the Independent Scientific Advisory Board, the APR conducted a scientific review on the state of artificial production within the Basin and produced a set of guidelines for hatchery practices, ecological interactions, and genetics. 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."

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 current system. This evaluation was completed in the second phase of the Council's response to Congress: the Artificial Production Review and Evaluation (APRE) (Council Document 2003-17). The APRE examined 227 individual salmonid hatchery programs within the US portion of the Basin.

The year-long 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. APRE reviewed each program's stated purpose, evaluated how well the program met its intended objectives, and outlined potential risks in operating the program. The information was then compiled into provincial and Basin-wide overviews of artificial production.

In order to assure that the value of the work was preserved, an interactive, web-accessible database was developed (www.apre.info). The database was designed to be flexible and to allow 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. The information has already been used in a collaborative development of Hatchery Genetic Management Plans (HGMP).

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."[1]

The review and evaluation efforts of 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. Most of today's hatchery production still seeks to produce fish for out-of-Basin and mainstem harvest goals. 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.

[1]Artificial Production Review and Evaluation Draft Basin-Level Report, Northwest Power and Conservation Council Document 2003-17.

III. The Role of Hatcheries in the Future

A new paradigm for hatchery usage must be established—a paradigm in which species and populations diversity are emphasized and local needs are considered. Salmonid populations should 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. Hatcheries 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 deficit between what these strategies can 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 arenas of habitat, hydropower, and harvest will benefit hatchery 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 changes in scientific knowledge.

IV. Recommendations for Re-aligning Hatcheries

The first step in re-aligning hatchery programs to meet current and future Basin needs is to define regional goals and measurable objectives for conservation, harvest, and the role of artificial production. The goals and objectives of all applicable planning processes should be examined in aggregate in order to refine current needs. Hatcheries, as

discussed above, are one of the strategies by which conservation and harvest goals can be met. Changes in hatchery programs may be needed to reflect changed goals and objectives.

Carefully defining hatchery program goals and objectives as they relate to subbasin and regional conservation and harvest goals and objectives is an indispensable step. As demonstrated by the APRE, hatchery programs fell into four categories in terms of their defined goals and objectives (some fell into more than one category): 1) goals and objectives are missing, 2) goals and objectives are not well defined or understood by hatchery program personnel, 3) goals and objectives do not reflect current environmental or societal needs and/or 4) goals and objectives require no change. It is important to articulate individual program goals and objectives as carefully as possible so that changes are instituted only where needed; altering programs solely for the sake of change is neither environmentally responsible nor cost effective. Only when goals and objectives are examined in detail can changes be tailored for individual programs.

All goals and objectives in all Basin watersheds must be consistent with the Council's fish and wildlife vision statement contained in the 2000 Fish and Wildlife Program document (Council Document 2000-19)[2] and with NOAA Fisheries recovery goals. In addition, articulation of goals and objectives must specify when they are expected to be achieved. Decisions about changes in hatchery programs must take cost into account.

Once goals and objectives have been defined, hatchery programs must be designed and operated in a manner consistent with goals for natural stocks. This will require that each hatchery program, depending upon their 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." [3] 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.

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[2] 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.*

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

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.[4] An integrated program obtains fish from a specified natural population, limiting its 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.

No matter what type of propagation program is determined to be the best for meeting specific goals and objectives for watersheds within the Basin, hatchery reforms must be promptly implemented. An action plan, coordinated with NOAA Fisheries processes, must be developed and short- and long-term priorities must be identified. The action plan and priorities must balance achievement of harvest and conservation goals with reduction of risk to natural populations and take into account current and future habitat conditions. For example, where production programs degrade endangered populations, priority actions identified in the HGMPs must be implemented.

V. Strategies for Implementation of Hatchery Re-alignment

The goal of the implementation phase is to help the co-managers develop hatchery plans that are consistent with the Council's Fish and Wildlife Program, are aligned with and complementary to the subbasin plans, and contribute to the NOAA Fisheries recovery goals. The process will result in an integrated strategy combining subbasin and hatchery plans to meet harvest and recovery goals for the Columbia Basin. The strategy will be reflected in the Council's Fish and Wildlife Program and will be in accordance and compatible with NEPA and ESA recovery documents and schedules. The ultimate result will be a Basin-wide comprehensive plan which will guide implementation of hatchery measures consistent with, and complementary to, habitat and harvest measures.

Implementation of hatchery re-alignment must start with agreement on regional goals and measurable objectives for conservation, harvest, and the role of hatcheries. Development of a protocol to allow communication between co-managers and subbasin planning groups would be very important to this effort. 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 gain an understanding of how hatcheries can be integrated into their plans to achieve subbasin goals.

While comprehensive agreements are being developed, the highest priority reforms must be implemented without delay. Highest priority actions would include changes to hatchery programs known to have substantial adverse effects on the most depressed or endangered wild fish populations.

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

Once agreement has been reached, a results-oriented, performance-based management system must be established to evaluate hatchery operations and their results in comparison with program goals and objectives. The system would use scientific information from monitoring programs to reduce ecological and biological risks and maximize benefits (and cost effectiveness) of using the hatchery programs. It requires that desired results be defined and consistent with the Council's vision statement, legal mandates, and Basin planning goals. It also requires that program performance be measured and formally reviewed on an established schedule.

A strategic plan will be developed and will contain definitions of goals and objectives. Standards will be established to define the level of performance to be achieved by program activities. Application of the standards will be objective and measurable. "Measurability" will likely be defined through performance indicators such as trends in abundance and harvest.

Periodic hatchery reviews will be used to evaluate progress toward resource goals and levels of risk; the evaluations will identify where program changes are needed. Evaluation will require formulation of a set of questions, linked to measurable performance indicators and standards, whose answers will determine the success of the hatchery programs. "Success" will be based on a program's consistency with resource goals (considering both benefits and risks), coordination with other strategies (habitat, harvest, hydrosystem), and progress toward meeting the goals.

A panel could be established to aid the evaluation and re-alignment efforts. The panel could include scientists, the hatchery manager, agency representatives, the funding entity, and the operating entity. Representatives of the panel would attend the periodic reviews to provide advice, contribute to the applicable reports, identify research needs, and ensure consistency across the Basin.

An essential part of implementation is the development and establishment of an internet-based system 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 (but not limited to) 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 the public, contributing to transparency and empowering self-governance.

VI. Conclusions

The Council's review of artificial production within the Columbia River Basin resulted in a number of conclusions which will be used to shape design and implementation of an

action plan aimed at improving the role of hatcheries in achieving Basin-wide fisheries goals.

- Artificial production programs need to be viewed in a new way compatible with current needs (including local needs), social conditions, and mandates including conservation of the environment, ecosystems, and species.

- Salmonids should be returned as closely as possible to their historic ranges, distribution, and diversity through a variety of means including habitat protection, restoration, and the appropriate use of hatcheries.

- Hatchery plans must be part of and consistent with other plans and requirements including subbasin plans, the Endangered Species Act, and NEPA.

- The first step in achieving integration of hatcheries into a Basin-wide comprehensive plan is to define regional goals and measurable objectives for conservation, harvest, and the role of artificial production.

- Hatchery programs must be designated and operated as either integrated or segregated.

- Hatchery reforms must be prioritized and promptly implemented. Prioritization must balance achievement of harvest and conservation goals with reduction of risks to natural fish populations. Highest priority reforms must be implemented immediately.

- Once agreement on regional goals and measurable objectives has been reached, a results-oriented, performance-based management system must be established to guide hatchery reforms.

- An internet-based system to disseminate data and information, generate reports, and facilitate communication and record-keeping must be developed to aid in evaluating goals and objectives and determining needed hatchery program changes.
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