*U.S. DEPARTMENT OF COMMERCE*
*Office of Inspector General*

# *NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION*

## *Northwest Fisheries Science Center Needs Improved Research Management Processes to Better Implement its Salmon Research Plan*

*Report No. STD-14440/September 2002*

**PUBLIC RELEASE**

*Office of Audits, Science & Technology Audits Division*

**UNITED STATES DEPARTMENT OF COMMERCE**
**The Inspector General**
Washington, D.C. 20230

SEP 30 2002

**MEMORANDUM FOR:** Dr. William T. Hogarth
Assistant Administrator For Fisheries
National Oceanic and Atmospheric Administration

**FROM:** Johnnie E. Frazier

**SUBJECT:** *Northwest Fisheries Science Center Needs Improved Research Management Processes to Better Implement Its Salmon Research Plan*
Final Audit Report No. STD-14440-2-0001

Attached is our final report on the Northwest Fisheries Science Center's use of its Salmon Research Plan to guide its salmon recovery research. By creating the plan, the center took an important step toward managing its salmon research, but more can be done to ensure the credibility, effectiveness, and transparency of this process. The executive summary begins on page i, and recommendations appear on pages 7, 11, and 16. NOAA's response to our draft report is summarized in the report and its complete response is included in Appendix II.

We appreciate the level of attention and careful consideration that you and your staff took to address our findings and recommendations. Steps discussed in your response to our draft report should provide a firm foundation for developing an audit action plan. As required by DAO 213-5, please provide us with the audit action plan addressing all of the report recommendations within 60 days of this memorandum. Should you need to discuss the contents of this report or the audit action plan, please call me at (202) 482-4661, or Michael Sears, Assistant Inspector General for Auditing on (202) 482-1934.

Attachment

cc: Vice Admiral Conrad C. Lautenbacher, Jr., USN (Ret.)
Under Secretary for Oceans and Atmosphere

Scott Gudes
Deputy Under Secretary for Oceans and Atmosphere

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Chief Financial Officer/Chief Administrative Officer

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## EXECUTIVE SUMMARY

Under the authority provided by the Endangered Species Act of 1973, the National Marine Fisheries Service (NMFS) is responsible for preventing the extinction and protecting the habitats of marine fish, mammals, sea turtles, and anadromous fish (such as Pacific salmon), which migrate between the ocean and inland waterways.

NMFS' Northwest Regional Office and Northwest Fisheries Science Center are responsible for managing and protecting living marine resources, as well as, handling the endangered species program in the Pacific Northwest. As such, they are responsible for the area that includes both inland rivers and streams where salmon migrate in Washington, Oregon, Idaho, and Montana, including much of the Columbia River Basin, to large stretches of the Pacific Ocean. The regional office identifies living marine resources and lists species that are endangered or threatened in its coverage area, works with groups whose proposed projects could harm the listed species to mitigate the harm, and creates management policies and plans to protect those species and their habitat. The center, in turn, supports the regional office by assessing the status of living marine resources in the Pacific Northwest and conducting scientific research to determine how best to protect, recover, and wisely use these valuable resources. While the Center has a large and growing groundfish program and conducts research on other marine species, much of the center's activities focus on Pacific salmon species, or "salmonids"[1] (which include steelhead trout).

The Pacific Northwest presents some especially difficult challenges to the work of NMFS: the decline of salmon populations and NMFS' steps to restore them have often been at odds with the competing interests of communities, environmental groups, and businesses, and have in some cases resulted in litigation. It is in this environment that the Northwest Fisheries Science Center strives to conduct sound scientific research to improve the status of evolutionarily significant units (ESUs),[2] or populations of endangered and threatened Pacific salmon. With its headquarters in Seattle, the center is organized into five divisions that conduct basic and applied research that is needed to conserve and manage living marine resources and their habitats in the Pacific Northwest. In the area of salmon recovery, Center scientists conduct research on habitat, harvest, hydropower (dams), and hatcheries. (For example, scientists study what attributes contribute to a healthy salmon habitat and how to improve juvenile salmon survival during their passage through dams.) The divisions are supported by five field stations,

[1] The center's Salmon Research Plan—the topic of this report—refers to salmonid populations of salmon and steelhead trout. Throughout the report we use the term salmon to mean this entire range of populations.

[2] Of 26 salmon ESUs, the Northwest Region and Science Center have lead responsibility for recovery planning relating to 16 ESUs (those that are located in Washington, Oregon, and Idaho) and the Southwest Region and Center have responsibility for 9 ESUs (those located in California). The two Regions and Centers share responsibility for one ESU that is located on the Oregon/California border. As amended in 1978, the Endangered Species Act allows listing of "distinct population segments" of vertebrates as well as named species and subspecies. NMFS policy stipulates that a salmon population (or group of populations) will be considered "distinct" for purposes of the act if it represents an evolutionarily significant unit of the biological species. An ESU is defined as a population that (1) is substantially reproductively isolated from other conspecific (same species) populations and (2) represents an important component in the evolutionary legacy of the species.

which use freshwater and saltwater laboratories or other research areas to provide a staging ground for much of the center's research.

In fiscal year 2001, the center's budget for salmon research was $23.6 million out of its total budget of $44.4 million. However, less than half of this work was funded from NMFS' $184.8 million appropriation for salmon recovery efforts. With the bulk of NMFS' FY 2001 funds mandated for state and tribal use, the center received $9.3 million from the appropriation and obtained the balance of its salmon budget ($14.3 million) by performing work, primarily hydropower research, under reimbursable agreements. Much of its reimbursable funding comes from the Bonneville Power Administration and the U.S. Army Corps of Engineers. These two agencies operate and maintain many of the dams in the Columbia River Basin. As part of their responsibilities to preserve and protect endangered and threatened populations impacted by the operation of the dams, both of these agencies fund salmon research.

**The Salmon Research Plan**

In December 2000, the Northwest Regional Office issued the 2000 Federal Columbia River Power System Biological Opinion. This document sets out methods for mitigating the impacts of federally operated dams, powerhouses, and associated reservoirs on the migration of salmon up and down the Columbia and Snake Rivers. The 2000 opinion replaces the original 1995 opinion, which was limited to endangered and threatened populations only in the Snake River. Since that time, nine additional populations in the Columbia River Basin have been listed as endangered or threatened.

As described in the Salmon Research Plan and in our discussions with center managers, while helping the regional office formulate the 2000 opinion, the center discovered that it lacked basic scientific information, such as population estimates and the impact of various risk factors on population growth, needed to provide pertinent advice about actions affecting salmon. Given the number of salmon research projects that had been conducted over the years, often in specific targeted areas, this lack of information was a cause for concern and prompted the center to develop the Salmon Research Plan. The plan, completed in September 2000, is built on a framework of 10 broad questions (and numerous, specific subquestions) that sets an ambitious, interdisciplinary research agenda for salmon recovery designed to ensure that center projects directly further recovery efforts.

**OIG Audit**

We conducted a performance audit to assess management controls used to implement the Salmon Research Plan, specifically focusing on (1) procedures for obtaining peer review of the plan, (2) strategies and processes for implementing the plan, and (3) methods for ensuring that ongoing work answers the 10 research questions. OMB Circular A-123, Management Accountability and Control, requires federal agencies to develop management controls to ensure that programs achieve their intended results. To determine the appropriate controls for a science research program, we reviewed relevant

guidance from OMB, the National Academy of Science and its National Research Council, the U.S. General Accounting Office, and other organizations. Our findings and recommendations are summarized as follows:

**The salmon research plan is an important step toward meeting the center's goal of strengthening its salmon research program**. The Salmon Research Plan establishes the center's salmon research goals and priorities for salmon recovery, supports NMFS' strategic goal to recover and maintain protected species, and was shared with other NMFS organizations through a number of meetings and workshops to receive feedback and input. The center has already used the plan to implement several support programs that will improve the collection of salmon data and define the status and risk factors for each endangered and threatened population and related habitat. The steps taken by the center to develop the plan reflect some of the best practices considered essential to developing solid research programs.

In addition, these steps also support OMB investment criteria recently issued in support of the President's science agenda for fiscal year 2004. The criteria challenge managers at all levels of government to create well-conceived plans that, for every program, identify goals, priorities, and links to national and "customer" needs; justify how funds will be allocated to ensure quality; and implement appropriate outcome measures and milestones for tracking progress toward goals and assessing whether funding should be enhanced or redirected. The center's work on the Salmon Research Plan and its ongoing activities to implement the actions developed during our review put it in a better position to complete OMB's investment criteria. Ultimately, we believe these steps will lead to a research program that addresses the best practices recommended by the National Research Council and other organizations and the research results desired by the center (see page 5).

**The center should improve its peer review process.** Despite the many positives of the Salmon Research Plan, its true value for improving the quality of the center's salmon-related work has not been rigorously evaluated via a transparent and documented peer review process that considers whether the questions reflect the correct priorities. Peer review is considered by experts at the National Academy of Science to be one of the most effective methods for evaluating the quality and merit of scientific research plans, proposals, programs, and products, and is commonly used by government agencies and other organizations to obtain independent assessments of such work. Peer review can promote operational efficiency by helping steer an organization's activities in a productive direction.

Although the Northwest Fisheries Science Center reportedly often uses peer review to check reports before they are finalized and has research papers published in peer-reviewed professional journals, it did not conduct a formal peer review of the Salmon Research Plan and does not have a documented peer review policy or a well-defined process for performing peer review of its research plans. NMFS guidance requires that science centers have formal peer review policies and processes, but offers no specific direction for establishing such procedures. NMFS should revise this guidance to clearly delineate the requirements for documented peer review processes. In addition, the

Northwest Fisheries Science Center should document its existing peer review process, add a step for obtaining formal comment on research plans, and use this revised process to formally peer review the Salmon Research Plan (see page 6).

**The center needs to develop multiyear plans for implementing the Salmon Research Plan.** Multiyear plans are a management control that takes broad objectives, such as those posed by the 10 questions in the Salmon Research Plan, and details a blueprint for measuring progress toward achieving them. According to experts at the National Research Council and other organizations, multiyear plans have several benefits: they (1) provide a framework for integrating research programs across functional and organizational boundaries; (2) establish a mechanism for evaluating ongoing research, identifying data gaps, and involving stakeholders; (3) introduce transparency into program/center activities by providing interim performance measures that link to longer term strategic goals; (4) enhance efforts to obtain needed resources; and (5) provide methods to better anticipate, evaluate, and complete research activities within time frames that are more realistic than annual projections.

Based on guidance that described attributes of a multiyear plan provided by the National Research Council and other government organizations, we evaluated the planning documents we received from the center to determine whether the documents constituted multiyear plans that could be used to implement the research programs that would answer the 10 questions in the Salmon Research Plan. We found that although the Salmon Research Plan had been in place for nearly 2 years, the center has developed multiyear plans for only 3 of the 10 research questions (see table 1). In addition, while NMFS Northwest regional managers (who benefit from the center's research) participated in meetings used to develop the plan, these managers told us that they have had limited formal involvement in decisions related to implementing the Salmon Research Plan.

**Table 1. OIG Evaluation of Whether Research Questions Were Supported by Multiyear Plans**

| 10 Research Questions[3] | OIG Findings Regarding the Question: *Is there a multiyear plan that addresses how this research question will be answered?* |
|---|---|
| 1. How can we identify the requirements for viability in a salmonid ESU so that we can provide quantitative goals for recovery? | No. |
| 2. Is salmon harvest compatible with recovery of ESA listed populations? | No. |
| 3. To what extent do hydropower operations contribute to the declining population trends evident in many salmon populations, and how can we quantify the benefits of major alterations in hydropower operations? | No. |
| 4. To what extent do hatchery operations of any kind contribute to or mitigate the risk of extinction faced by wild salmon populations? | Yes, however some significant attributes missing. |
| 5. Can we establish explicit links between salmon productivity and habitat attributes that can be protected or restored via management actions? | Yes, however some significant attributes missing. |
| 6. Should our strategies for salmon recovery take climate change into account? | No, however some climate change projects are in the multiyear plan for question 7. |
| 7. How do ocean and estuarine conditions and the "4-H" risk factors interact and potentially constrain opportunities for recovery? | Yes, however some significant attributes missing. |
| 8. Is there a way of making the ideal of "ecosystem and multispecies management" operational for salmon? | No, however some nutrient and predation projects are in the multiyear plans for question 5 and 7. |
| 9. What are the impacts of nonindigenous species on salmon and how might these impacts be mitigated? | No, however some nonindigenous species projects are in the multiyear plan for question 7. |
| 10. Using economic analyses to establish conservation priorities. | No. |

Center managers concurred with our assessment that multiyear plans could be completed for most of the questions, and reported that they have some of the information they need to proceed with plans for certain questions. For some other questions, they pointed out that the center has only recently obtained either the expertise or the funding to conduct the necessary research.

In regards to the hydropower research, managers stated the research needs are well known and defined in the 2000 biological opinion and research plans completed by the outside funding agencies with input from center staff. However, we believe that a multiyear hydropower research plan is important to (1) ensure that the highest priority hydropower questions and subquestions in the center's Salmon Research Plan are being fully addressed, (2) provide a single source of information that can be used by decision makers and interested stakeholders to understand the projects, funding, and milestones for the research being conducted by the center in this area, and (3) show via performance measures how research in this area is contributing to salmon recovery.

[3] The Salmon Research Plan, Volume II. Although the Salmon Research Plan describes these research areas as 10 questions, the research area listed as number 10, "*Using economic analyses to establish conservation priorities"* is not phrased as a question in the plan.

NMFS Northwest regional and center management should ensure that a consistent method exists for involving the Northwest Regional Office and other stakeholders in developing multiyear plans to achieve the goals of all 10 research questions. The Northwest science center should also (1) develop multiyear plans that include standard planning attributes, (2) work with regional staff to identify potential sources of funding for projects contained in the multiyear plans, and (3) follow appropriate peer review processes (see page 8).

**The center needs better processes for managing ongoing work.** The Salmon Research Plan challenges the center to carefully evaluate its research projects and prioritize those projects that "contribute in a major way to answering one of these key questions." We found that the center lacked adequate controls for (1) documenting how ongoing in-house and reimbursable funded research is answering questions in the plan, (2) ensuring that its annual planning and project approval process documents the specific ways in which proposed work will support the plan, and (3) tracking actual time spent on projects to provide decision makers with the data they need to make informed decisions about the cost of salmon recovery research and ensure that funds obtained from reimbursable agreements are sufficient to cover the work. The center also could not demonstrate how the Salmon Research Plan is used as criteria during program reviews done by internal and external reviewers to assess the merit of its programs. However, it incorporated the appropriate research questions from the plan as criteria for the next program review during our audit.

The science center should assess and document the extent to which existing projects support finding answers to the salmon questions, clearly link the Salmon Research Plan to its annual planning and project approval process, implement a system to track full program costs, and permanently incorporate the research questions into its program review criteria (see page 11).

In response to the draft report, NOAA agreed with all of our recommendations and further stated that all of its NMFS science centers could benefit from undertaking similar actions. NOAA also made a number of comments that we summarized and addressed at the end of this report, some of which resulted in our adding further clarification or additional details to the report. NOAA's complete response to our findings and recommendations is included as Appendix II.

# INTRODUCTION

Under the authority provided by the Endangered Species Act (ESA) of 1973, the National Marine Fisheries Service (NMFS) is responsible for preventing the extinction and protecting the habitats of marine fish, mammals, sea turtles, and anadromous species (such as Pacific salmon), which migrate between the ocean and inland waterways.

NMFS fulfills these missions via activities conducted at its headquarters in Silver Spring, Maryland, and five regional offices, each of which is responsible for identifying species that are endangered or threatened and developing regulations, guidelines, and management policies to protect those species and their habitats. Regional science centers, in turn, support these policies by assessing the status of living marine resources at risk for significant population loss and by conducting research to determine how best to protect, recover, and wisely use these valuable resources.

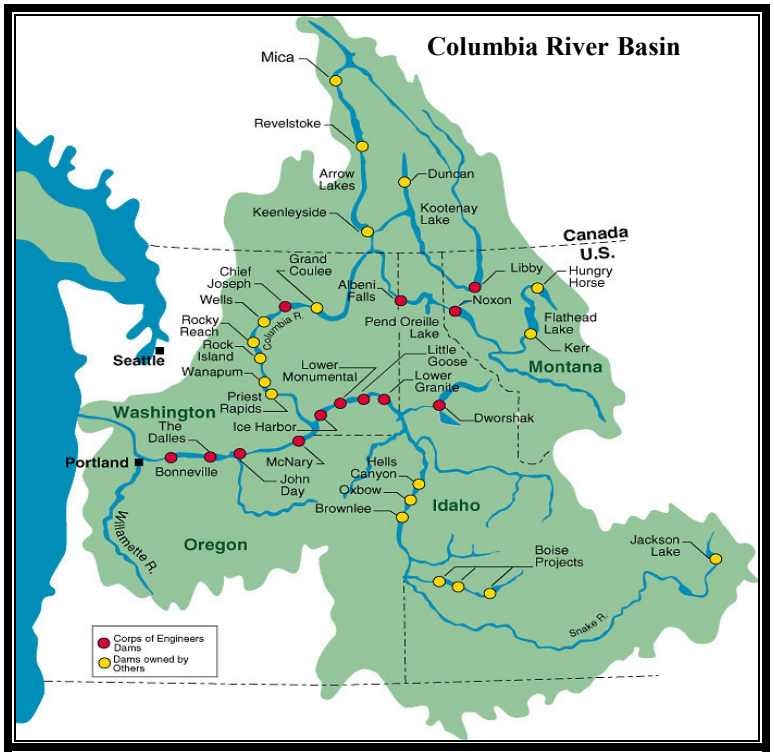
NMFS' work is often controversial. The Endangered Species Act requires the U.S. Fish and Wildlife Service or NMFS, depending on the species, to determine whether to add a species to the federal lists of endangered and threatened wildlife and plants. Once listed, species are afforded the full range of protections available under the act, including prohibitions on killing, harming, or otherwise taking them. In addition, ESA requires all federal agencies to protect threatened and endangered species and to consult with the U.S. Fish and Wildlife Service or NMFS, depending on the species, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitats. NMFS issues biological opinions that comment on whether a federal action is likely to harm a species or habitat. When such effects are possible, NMFS may offer terms and conditions on the action or give reasonable alternatives to the proposed action. The consultation process that produces a biological opinion can also result in the action agency changing its proposed action. The stakes for those impacted by the consultation process and biological opinions are often high: agency negotiations or NMFS' findings can determine whether water is released for irrigating a farmer's crops, land is leased for grazing cattle, salmon are harvested, or dams and roads are built.

## Saving Salmon in the Pacific Northwest

The Pacific Northwest region presents some especially difficult challenges for NMFS: the decline of salmonid[1] populations (including salmon and steelhead trout) and NMFS' steps to restore them have at times clashed with the interests of communities, environmental groups, and businesses, and have in some cases resulted in litigation. It is in this environment that the Northwest Fisheries Science Center strives to conduct sound scientific research to improve the status of evolutionary significant units (ESUs)[2] of endangered and threatened Pacific salmon.

[1] The center's Salmon Research Plan—the topic of this report—refers to salmonid populations of salmon and steelhead trout. Throughout the report we use the term salmon to mean this entire range of populations.
[2] Of 26 salmon ESUs, the Northwest Region and Science Center have lead responsibility for recovery planning relating to 16 ESUs (those that are located in Washington, Oregon, and Idaho) and the Southwest Region and Center have responsibility for 9 ESUs (those located in California). The two Regions and Centers share responsibility for one ESU that is located on the Oregon/California border. As amended in

Headquartered in Seattle, the center is organized into five divisions that conduct basic and applied research used by NMFS' Northwest Regional Office and other decision-makers to conserve and manage living marine resources and their habitats in the Pacific Northwest. This area includes both inland rivers and streams where salmon migrate in Washington, Oregon, Idaho, and Montana, including much of the Columbia River Basin, to large stretches of the Pacific Ocean off the Washington and Oregon Coasts. The center's salmon research is largely devoted to understanding the complexities of salmon biology and ecology, and has a diverse focus that includes genetics, fish health and disease, hydrosystem (dam) passage, hatchery reform, habitat restoration, harvest models, and biological productivity.




*Source: U.S. Army Corps of Engineers, Northwestern Division Website*
*http://www.nwd-wc.usace.army.mil/report/colmap.htm*

The Northwest Regional Office and science center's service area includes the entire U.S. portion of the Columbia River Basin—an area that spans 4 states.

The center is also supported by five field stations, which use freshwater and saltwater laboratories or other research areas to provide a staging ground for the center's research.

1978, the Endangered Species Act allows listing of "distinct population segments" of vertebrates as well as named species and subspecies. NMFS policy stipulates that a salmon population (or group of populations) will be considered "distinct" for purposes of the act if it represents an evolutionarily significant unit of the biological species. An ESU is defined as a population that (1) is substantially reproductively isolated from other conspecific (same species) populations and (2) represents an important component in the evolutionary legacy of the species.

Though salmon research is the one of the center's primary missions, less than half of this work is funded by NMFS. In fiscal year 2001, for example, the center's budget for salmon research was $23.6 million (of a total budget of $44.4 million). NMFS' appropriation for salmon recovery efforts was $184.8 million, but because the bulk of these funds were mandated for state and tribal use, the center received $9.3 million from the appropriation. It obtained the balance of its salmon budget ($14.3 million) by performing work, primarily hydropower research, under reimbursable agreements. Much of its reimbursable funding comes from the Bonneville Power Administration and the U.S. Army Corps of Engineers. These two agencies operate and maintain many of the dams in the Columbia River Basin. As part of their responsibilities to preserve and protect endangered and threatened populations impacted by the operation of the dams, both of these agencies fund salmon research.

**The Salmon Research Plan**

In December 2000, NMFS issued the 2000 Federal Columbia River Power System Biological Opinion which was intended to mitigate the impact of federally operated dams, powerhouses, and associated reservoirs on the migration of salmon and steelhead up and down the Columbia and Snake Rivers. The 2000 opinion replaces the original 1995 opinion, which was limited to listed species only in the Snake River. Since that time, nine additional populations in the Snake and Columbia rivers have been listed.

As described in the Salmon Research Plan and in our discussions with center managers, while helping the regional office formulate the 2000 opinion, the center discovered it lacked basic scientific information, such as population estimates and the impact of various risk factors on population growth, needed to provide pertinent counsel on actions affecting salmon. Given the number of salmon research projects that had been conducted over the years, often in specific targeted areas, this lack of information was a cause for concern and prompted the center to develop the Salmon Research Plan. This document, authored by several of the center's senior scientists and completed in September 2001, poses 10 broad questions (and numerous, specific subquestions) that—in challenging the center to answer—aim to promote scientific research which supports recovery. Its clearly stated goal is to set a standard against which the potential contribution of each proposed study can be measured: "If a research project does not contribute in a major way to the answering of one of these key questions," the plan states, "then the priority of that project needs to be reconsidered." (See the appendix for a listing of the questions and subquestions.)

## OBJECTIVES, SCOPE, AND METHODOLOGY

From January through June 2002, we conducted a performance audit to assess management controls used to implement the Salmon Research Plan, specifically focusing on the center's (1) procedures for obtaining external peer review of the plan, (2) strategies and processes for implementing the plan, and (3) methods for ensuring that ongoing work answers the 10 research questions. To determine appropriate controls for scientific research programs, we reviewed research management and peer review guidance provided by the National Academy of Science and the associated National Research

Council,[3] U.S. General Accounting Office, and others. Some of this guidance was based on consultation these organizations provided to the Environmental Protection Agency (EPA) in response to congressional pressure to improve EPA's science programs. The research process they recommended to EPA science centers and laboratories is similar to that started by the Northwest center, and thus offers a good model for comparison. To underscore the importance of careful management of research and development programs, we also reviewed research management guidance recently provided by OMB as part of President Bush's management agenda.

To understand NMFS planning and research management processes, we interviewed managers, scientists, and administrative staff from NMFS headquarters, Northwest Regional Office, and Northwest Fisheries Science Center, as well as from the science center's field stations in Manchester and Pasco, Washington. We reviewed NMFS' strategic plans, policies, and procedures, GAO reports, OMB guidance regarding management controls, and pertinent laws and regulations. We examined selected reimbursable agreements, spending plans, current year operating plans, issue papers, and other appropriate documentation. We did review—for background information only—computer-generated data regarding appropriated and reimbursable funds used by the center for salmon research in fiscal year 2001, and believe that for our purposes, the data was sufficiently reliable.

Our primary concern was whether internal controls related to the plan's development and implementation were adequate. Overall, we found that the science center did not have sufficient processes or documented policies for ensuring the adequacy of its peer review, planning, or program review processes.

We conducted our audit in accordance with generally accepted government auditing standards, under authority of the Inspector General Act of 1978, as amended, and Department Organization Order 10-13, dated May 22, 1980, as amended.

[3] The National Research Council was organized by the National Academy of Sciences to improve understanding of science and technology, and to advise the federal government on related issues.

## FINDINGS AND RECOMMENDATIONS

### I. The Salmon Research Plan Is An Important Step Toward Meeting The Center's Goal Of Strengthening Its Salmon Research Program

The center, in developing the Salmon Research Plan, took an important proactive step to identify research priorities to guide its salmon research. Such steps are now being recommended as part of the President's science agenda for fiscal year 2004, which calls for federal agencies to maximize the efficient and effective use of the nation's research and development (R&D) resources. In support of the President's agenda, OMB recently issued R&D investment criteria, which challenge managers at all levels of government to create well-conceived plans that, for every program, identify goals, priorities, and links to national and "customer" needs; justify how funds will be allocated to ensure quality; and implement appropriate outcome measures and milestones for tracking progress toward goals and assessing whether funding should be enhanced or redirected. The Center's work on the Salmon Research Plan and the actions outlined in our report put them in position to complete the investment criteria laid out by OMB.

Not only did the center position itself to satisfy the criteria identified by OMB, but it also initiated a research management process that utilized best practices recommended to other science organizations. While no explicit criteria exists for how to implement science research programs, experts that have reviewed government research programs recommend a number of best practices for research and development efforts that directly relate to the OMB criteria. Many of these practices emerged from assessments by the NRC, GAO, and other experts of EPA's research management needs. In that instance, it was determined that EPA did not have a coherent agenda and operating plan to guide scientific efforts at its headquarters, laboratories, and centers, or to support its focus on high-risk environmental problems.[5] Similar to the situation at NMFS' Northwest center, EPA's voluminous scientific data had many critical gaps that required long-term research to fill.

The experts recommended that EPA (1) create a strategic planning and management process, (2) require individual labs and centers to develop research plans that support the strategic plan, and (3) make lab and center directors responsible for defining and justifying the priority problems for their part of the organization and for identifying and developing research and technical support programs that reflect those priorities. The experts also called on EPA to use priority-setting processes that are transparent and documented, thereby giving decisions greater credibility among the broad range of stakeholders within and outside the agency.

The Northwest science center's Salmon Research Plan embodies attributes recommended for EPA, and is thus a significant accomplishment: the center's plan responds to goals contained in NMFS' strategic plan, namely, to recover and maintain protected species. It establishes program priorities and was shared with other NMFS organizations through a

[5] EPA (U.S. Environmental Protection Agency), Safeguarding the Future: Credible Science, Credible Decisions. Expert Panel on the Role of Science at EPA, 1992.

number of meetings and workshops to receive feedback and input. The center has already implemented several support programs referred to in the plan: a data management group that will improve data handling and expand collection to include salmon-related information from state and tribal fishery biologists, and a "cumulative risk initiative"—a process for clearly defining the status and risk factors for each endangered and threatened population and related habitat.

## II. The Center Should Improve Its Peer Review Process

Given the numerous stakeholders and myriad competing interests involved in Pacific salmon recovery, and the importance of the center's recovery efforts, the quality and merit of the Salmon Research Plan must be evaluated and documented. Peer review is considered one of the most effective methods for evaluating the quality of federally funded and conducted research, and government agencies often use this process to obtain assurance of program quality. Peer review is a means of assessing the merit of research programs by independent, unbiased experts who have the technical and scientific knowledge to perform such analysis.[4] The Northwest science center did not subject the Salmon Research Plan to a formal peer review—largely because it has no formalized process for such plans. Thus, it has no documented unbiased affirmation that the plan identifies the most critical research questions, can foster stakeholder buy-in, and reflects the credibility and transparency of the center's planning process.

### A. The center did not obtain formal comments on its Salmon Research Plan.

Despite the many positives of the Salmon Research Plan, its true value for improving the quality of the center's salmon-related work has not been rigorously evaluated via a transparent and documented peer review process that considers whether the questions reflect the correct priorities.

Center management staff recognized the importance of peer review and put the plan to a test they believed was adequate: they reported presenting it to NMFS staff at a December 2000 planning and management meeting, posting it for review on the center's web site, and providing it to an independent science advisory board and selected outside stakeholders with the notation, "for your information and for comment as appropriate." These staff also stated that all of the comments they received on the plan were general, and described the plan "as a clear, cogent articulation of the key questions that should guide research toward salmon recovery." Staff also noted that they had "received no specific feedback…and in particular, no comments to suggest that any of the questions were not on the mark."

We asked staff to provide us with documentation of this review process and the comments that resulted, but they could not produce any. We also checked the web site to view the plan and found that it was not available there, but was instead on the center's

[4] Committee on Science, Engineering, and Public Policy of the National Academy of Science, 1999. *Evaluating Federal Research Programs, Research and the Government Performance and Results Act.* Washington, DC: National Academy of Press.

"internal" intranet, which is accessible to employees only. When we pointed out the error, the center quickly rectified it by placing the plan on its Internet site.[5]

We do not doubt that the center sought a review of the plan at the NMFS management conference and from an independent advisory board. But without appropriate documentation of a review by independent experts who have no conflict of interest with the center, the Salmon Research Plan lacks the high level of transparency, accountability, and credibility it needs to ensure that it is an effective tool for forging the appropriate research to meet the center's data-gathering goals.

**B. The center does not have a documented peer review process.**

NMFS' *Science Quality Assurance Program, Fisheries Science Center Accreditation Standards*, establishes broad guidelines for peer review that each center must follow: "science centers shall develop a routine peer review process for stock assessments, scientific advice, and science programs." The details of the process are left to the centers' discretion.

Staff at the Northwest science center explained that virtually all center activities are subject to some level of peer review. For example, scientists review reimbursable project reports before the reports are finalized. In addition, research is written up and submitted to peer-reviewed professional journals. However, the center does not have a written policy that documents its standards and process for peer review, and has never developed a process for the peer review of planning documents like the Salmon Research Plan**.** Staff stated that they had begun developing an internal quality standard to detail the level and type of review the center would conduct for different products, but did not complete it because NMFS headquarters wanted to assess all of the center's programs under the Science Quality Assurance Program before additional actions were taken. We believe the science center should complete this standard because it would be a useful tool for ensuring that all products and proposed activities receive the appropriate level and type of peer review and that reviewer comments are documented. We also believe NMFS' guidance on peer review should clearly state that centers must put their policies in writing.

**C. Recommendations**

The assistant administrator for fisheries should take the necessary actions to ensure that:

1. NMFS headquarters revises the *Science Quality Assurance Program, Fisheries Science Center Accreditation Standards*, to clearly require science centers to develop documented peer review processes.
2. Northwest Fisheries Science Center managers
   - document existing peer review processes,

[5]The Salmon Research Plan can be accessed through the *featured link's* section of the center's home page located at http://www.nwfsc.noaa.gov/.

- develop a peer review process for research plans that includes a step for obtaining formal comments, and
- use this new process to conduct a formal review of the Salmon Research Plan.

### D. NOAA's Response to Recommendations

NOAA concurs with the recommendations.

## III. The Center Needs to Develop Multiyear Plans for Implementing the Salmon Research Plan

Once the center verifies the quality and merit of the Salmon Research Plan, it should use multiyear plans to track its progress toward answering the 10 questions from one year to the next. Multiyear plans are a management control that takes broad objectives, such as those posed by the 10 questions, and details a blueprint for measuring progress toward achieving them. Although the Salmon Research Plan has been in place for nearly 2 years, the center has developed multiyear plans for only a few of the research questions, and some of these are incomplete. According to the National Research Council and other experts, multiyear plans have several benefits: they (1) provide a framework for integrating research programs across functional and organizational boundaries; (2) establish a mechanism for evaluating ongoing research, identifying data gaps, and involving stakeholders; (3) introduce transparency into program/center activities by providing interim performance measures that link to longer term strategic goals; (4) enhance efforts to obtain needed resources; and (5) provide methods to better anticipate, evaluate, and complete research activities within time frames that are more realistic than annual projections.

OMB Circular No. A-123, Management Accountability and Controls, requires agencies to develop management controls for federal programs, such as policies and procedures that ensure, among other things, a program (1) achieves the intended results, (2) uses resources in a way that is consistent with the agency's mission, (3) complies with applicable laws and regulations, and (4) provides decision makers and stakeholders with reliable and timely information. These outcomes are similar to the benefits of multiyear plans cited by National Research Council and other experts. Therefore, we believe that multiyear plans are a reasonable management control for the center's salmon research program.

### A. Center managers need multiyear plans and strategies for answering the 10 questions.

Our review of the guidance provided by these experts and of the center's existing multiyear planning documents uncovered a number of attributes inherent in strong multiyear plans: typically, such plans are developed in coordination with key stakeholders, require peer review, and clearly delineate (1) research projects and priorities; (2) staff and funding requirements; (3) project milestones; (4) roles and responsibilities of significant partners; and (5) interim performance measures that link to long-term strategic goals. We evaluated the planning documents we received from the

center against these attributes to determine whether the documents constituted multiyear plans that supported the objectives of the 10 questions in the Salmon Research Plan. We determined that the center prepared multiyear plans for three of the research questions (questions 4, 5, and 7), although they did not contain all the key attributes. None of these multiyear plans had clear performance measures and only one had been peer reviewed.

The center did not prepare multiyear plans for seven other questions. However, some research projects related to questions 6, 8, and 9 were addressed in the multiyear plans for questions 5 and 7. (See table 1.)

**Table 1. OIG Evaluation of Whether Research Questions Were Supported by Multiyear Plans**

| **10 Research Questions**[1] | **OIG Findings Regarding the Question:** *Is there a multiyear plan that addresses how this research question will be answered?* |
|---|---|
| 1. How can we identify the requirements for viability in a salmonid ESU so that we can provide quantitative goals for recovery? | No. |
| 2. Is salmon harvest compatible with recovery of ESA listed populations? | No. |
| 3. To what extent do hydropower operations contribute to the declining population trends evident in many salmon populations, and how can we quantify the benefits of major alterations in hydropower operations? | No. |
| 4. To what extent do hatchery operations of any kind contribute to or mitigate the risk of extinction faced by wild salmon populations? | Yes, however some significant attributes missing. |
| 5. Can we establish explicit links between salmon productivity and habitat attributes that can be protected or restored via management actions? | Yes, however some significant attributes missing. |
| 6. Should our strategies for salmon recovery take climate change into account? | No, however some climate change projects are in the multiyear plan for question 7. |
| 7. How do ocean and estuarine conditions and the "4-H" risk factors interact and potentially constrain opportunities for recovery? | Yes, however some significant attributes missing. |
| 8. Is there a way of making the ideal of "ecosystem and multispecies management" operational for salmon? | No, however some nutrient and predation projects are in the multiyear plans for question 5 and 7. |
| 9. What are the impacts of nonindigenous species on salmon and how might these impacts be mitigated? | No, however some nonindigenous species projects are in the multiyear plan for question 7. |
| 10. Using economic analyses to establish conservation priorities. | No. |

The science center has neither formal policy nor procedures for developing multiyear plans. However, it did delegate responsibility for implementing the Salmon Research Plan and assign the title—salmon senior scientist—to the director of one of its divisions.

[1] The Salmon Research Plan, Volume II. Although the Salmon Research Plan describes these research areas as 10 questions, the research area listed as number 10, "*Using economic analyses to establish conservation priorities,"* is not phrased as a question in the plan.

The position's duties entail ensuring development and coordination of centerwide activities to implement the Salmon Research Plan, collaborating with center officials to develop research that addresses high-priority questions, and working with other divisions and regional offices to secure funding for needed research—all objectives that multiyear plans would address.

We found that the salmon senior scientist did not develop a strategy for coordinating implementation of the Salmon Research Plan. He explained that he allowed division directors to decide how to answer the questions on their own. As a result, the center wound up with a research agenda that lacked comprehensive multiyear planning which would better ensure that the goals of the Salmon Research Plan are met.

Without multiyear plans the center increasingly risks the following:

- **Being unable to readily demonstrate to Congress and other stakeholders how ongoing and planned research is moving toward answering the 10 questions.** Multiyear operating plans that detail salmon recovery efforts and track their progress could provide such information and be posted on the center's web site for review by all interested parties.

- **Missing funding opportunities for priority projects.** Regional staff stated that they could use multiyear plans that identify out-year research projects and funding needs to leverage dollars from one of the center's major sponsors—Bonneville Power Administration.

- **Lacking performance data to manage research priorities.** Multiyear planning generates historical performance data against which the center can assess its success at answering the questions and take actions to improve or revise its agenda accordingly. To develop such data, experts recommend using interim performance measures that link to long-term strategic goals. The ultimate outcome of the center's activities should be data that supports implementation of successful recovery actions for endangered and threatened stock. Reaping the benefits of these actions will take years, and as described in the Salmon Research Plan, the center recognizes that choosing the wrong approach could have disastrous consequences.

Center managers concurred with our assessment that multiyear plans should be completed for most of the questions and reported that they have some of the information they need to proceed with plans for certain questions. Center managers also explained that for a few questions, for example question 10 concerning economic analyses, the center has not been in the position to complete multiyear plans. These managers explained that these questions were future priorities for which the center has had to hire experienced staff and obtain the necessary funding. These actions are now underway and center managers stated that they will create multiyear plans for these areas in the near future.

For question number 3, concerning the impact of hydropower operations on declining salmon populations, center managers explained that research needs are well known. For

example, these managers explained that research needs are discussed as part of the reasonable and prudent activities recommended in the 2000 biological opinion and in detailed research plans completed by the Northwest Division of the Corps of Engineers and the Northwest Power Planning Council, an organization created to guide Bonneville Power Administration funding. According to the center managers, staff conducting hydropower research already participate in setting the research agenda for these programs. However, we believe that the center should create its own multiyear hydropower plan to (1) ensure that the highest priority hydropower questions and subquestions in the center's Salmon Research Plan are being fully addressed, (2) provide a single source of information that can be used by decision makers and interested stakeholders to understand the projects, the amount of funding, and milestones for the research being conducted by the center in this area, and (3) show via performance measures how research in this area is contributing to salmon recovery.

### B. Multiyear plans should be developed in consultation with the regional office and other internal and external stakeholders.

Multiyear plans are important because they provide a better framework for integrating research programs across organizational boundaries, such as those that exist between the center and regional office. While NMFS regional managers (who benefit from the center's research) participated in meetings used to develop the plan, these managers told us that they have had limited formal involvement in decisions related to implementing the Salmon Research Plan. They reportedly reviewed the plan initially and thought the questions were on target, but have only been involved in helping develop the three existing multiyear plans. Seven questions remain for which they have had no formal input regarding related center research and regional office needs.

The regional director and several senior staff told us they want to be more involved in planning salmon recovery research. Because the center's work should support the Northwest region, we believe the participation of regional staff would facilitate the development of comprehensive multiyear plans for all the questions. Center managers agreed, and suggested meeting quarterly with regional officials to promote this collaboration.

In addition, the guidance we reviewed from other federal research entities recommended using multiyear plans to identify gaps in existing research and to gain input from stakeholders in the planning process. Other NMFS regions and centers as well as numerous state and local organizations conduct salmon research or rely on the Northwest science center's research to support their own recovery agendas. The center's multiyear planning process needs to include steps that identify the planned and completed research of outside entities and incorporate, to the extent possible, the needs of its stakeholders.

### C. Recommendations

The assistant administrator for fisheries should take the necessary actions to ensure that NMFS regional and center management establish a consistent method for involving the Northwest Regional Office and other stakeholders in developing strategies to achieve the

goals of all 10 research questions, and should require the center director to do the following:

1. Develop multiyear plans that clearly delineate (1) research projects and priorities; (2) staff and funding requirements; (3) project milestones; (4) roles and responsibilities of significant partners; and (5) interim performance measures that link to long-term strategic goals.
2. Work with the Northwest Regional Office to identify potential sources of funding for research projects included in the multiyear plans.
3. Follow appropriate peer review processes and document the results.

### D. NOAA's Response to Recommendations

NOAA concurs with the recommendations.

## IV. The Center Needs Better Processes for Managing Ongoing Work

As discussed earlier, OMB Circular No. A-123 requires federal agencies to implement management controls to ensure that programs achieve their intended results. In establishing the Salmon Research Plan, the Northwest center created a standard against which to evaluate its recovery activities:

> It is hard to imagine a well-designed experiment or study involving salmon that would not in some way be useful to salmon recovery or provide a valuable specific contribution. The value of all relevant research, however, is not the point. Given the dire status of salmon stocks, we must establish scientific priorities, and make sure that we answer the most important questions first. Indeed, the purpose of producing this research plan is to provide a standard against which each research project can be measured. . . .If a research project does not contribute in a major way to the answering of one of these key questions, then the priority of that project needs to be reconsidered.[8]

We examined whether the center had adequate management controls in place to ensure the program's success at finding answers to the targeted questions in the Salmon Research Plan, as the plan requires. Areas where improvements can be made are detailed below.

### A. The center has not documented how ongoing research is answering questions in the plan.

Knowing how much of the center's work currently supports the plan provides an important baseline for organizing and directing center resources (including staff). However, center managers have not documented how or whether existing research

[8] Salmon Research Plan, p.1.

supports the Salmon Research Plan, instead they evaluate the relevance of research to the plan primarily through discussions at management meetings. The center director stated that managers have a good handle on which work should be continued and which should be phased out based on a project's performance in relation to the questions. However, she noted that neither this analysis nor the resulting decisions have ever been documented. Center managers also acknowledged that not all salmon research is prompted by the Salmon Research Plan. Other drivers—such as the 2000 Federal Columbia River Power System Biological Opinion—dictate research priorities.

The center agreed that it should formally document its assessment of existing research against the standards in the Salmon Research Plan, and we believe that the presence of multiple research drivers underscores the importance of this documentation: not only would it provide the center with a baseline of data for work under way to answer the 10 questions, it would also identify what new work needs to be initiated and how much of the existing workload is directed toward priorities other than those stipulated in the Salmon Research Plan. This data would thus inform the multiyear planning process by pointing the way toward emerging research priorities as they relate to the 10 questions in the plan.

**B. The center should ensure that its annual planning and project approval processes document the specific ways in which proposed projects will support the Salmon Research Plan.**

Guidance from federal research entities recommends that the methods and criteria for selecting research priorities and projects be transparent enough to enable decision makers to evaluate the adequacy of both the budget development process and the resulting budget proposal. The experts note that such transparency would not only improve communication and understanding of the budget process for those outside the center, but would also bring greater efficiency to internal decision making.

The science center reported that its processes for annual planning and project approval incorporate a review of the work to be funded, to ensure that it meets the standard of the Salmon Research Plan. To assess whether these processes do in fact successfully align center work with the goals of the plan, we examined the methods used for requesting new funding, assigning base (appropriation) funding, and approving reimbursable agreements. We found that the center has no formal process for weighing the value of current research projects against the plan's goals, and thus for determining with certainty which projects to fund.

The science center needs to improve its annual project approval process to include documentation of a project's relation to and priority for achieving the goals of the Salmon Research Plan, and should incorporate the process into its standard operating procedures. The center agreed that it could do a better job of documenting its decision-making process and of ensuring that high-priority work is identified and funded.

The specific areas where improvements in its current processes should be made include the following:

**Requests for new funding relate to the plan, but should be more clearly linked to specific questions in the plan.** The center uses spending plans that detail funding needs and reasons for the request. We found that its FY 2001 spending plan does not specifically mention the Salmon Research Plan or any of its individual questions, but much of the work it discusses appears similar to the research described in the plan.

**Base-funded project decisions should be documented and linked to specific questions in the plan.** The center's processes for assigning appropriated funding are undocumented, and do not clearly link to the Salmon Research Plan. Funding decisions are based on input from several sources: center management meetings, issue papers, and current-year plans that detail the types of research to be conducted along with related milestones and annual resources. The center does not document decisions made at the meetings and thus has no formal record of how management evaluated projects in light of FY 2001 funding availability. In addition, its issue papers did not specifically link to the Salmon Research Plan, and it did not complete current-year operating plans for fiscal year 2001, which made it difficult for us to assess how funds and other resources were being used.

Center managers explained that current-year operating plans were to have been replaced by a new planning and budgeting system under development by NMFS headquarters. Completion of the system was unexpectedly delayed leaving the center without plans or a process to follow for fiscal year 2001. Although all of the components of the new system are not yet complete, the planning component has since been installed, managers reported, and is being used for current-year planning in FY 2002. While this system moves the center closer to a transparent project approval process, it still does not document how the selection of base-funded programs supports the Salmon Research Plan.

**Reimbursable work should be linked to specific questions in the plan.** Both proposals and agreements for reimbursable work lack specific links to the Salmon Research Plan. In the case of proposed research, the center provides, for management approval, a transmittal memorandum that contains brief, basic information about the project —the project's title and a three- or four-word description—but no links to the Salmon Research Plan. The reimbursable agreement, which accompanies the memo, provides more detail but no mention of the plan. The center maintains that its reimbursable work does support the 10 questions. To make that connection clear, we believe that future transmittals should include a sentence or two stating which question the work addresses and whether the project was envisioned in the multiyear plan.

**C. The center needs a process for tracking full project costs to provide managers with accurate historical information on which to base approval of proposed research activities.**

The Northwest science center does not adequately track resources and costs for individual projects. Our review of fiscal year 2001 records and our discussions with center managers revealed, for example, that the center does not have procedures in place to track the amount of time researchers spend per project. Instead, managers use budgeted amounts of time as the actual amounts expended.

In our August 1995 report, *Opportunities to Improve Management of NMFS Science Centers* (STL-7634-5-0001), we recommended that NMFS develop and implement a budget process that, among other things, includes procedures for tracking budget estimates to actual expenditures. NMFS responded at the time, that a planning, budgeting, and evaluating system then under development would provide this ability. However, NMFS has been working on this system since 1996, but has yet to complete it. With more than 70 percent of the center's budget in fiscal year 2001 tied to labor costs, knowing specifically where and how these funds are being used is important. Pending completion of NMFS' automated system, the science center needs its own process for tracking actual time spent on projects to provide officials with the data they need to make informed decisions about the cost of salmon recovery research, ensure that funds obtained from reimbursable agreements are sufficient to cover the work, and manage the center's overall operations effectively.

**D. The center should include the Salmon Research Plan in its criteria for assessing the merit of programs via the program review process.**

Program reviews are a form of peer review in which experts from within and outside an agency evaluate the relevance of research to agency goals. These reviews assess the appropriateness of the research to the agency's mission and its potential value for intended users, ultimately dictating whether a program should continue or terminate. Including the 10 questions in the assessment criteria for program reviews would further document a program's value in relation to the plan. Over time, these reviews provide key information that can redirect resources from low-priority projects to higher-priority pursuits.

According to center managers, selected program reviews have been conducted over the past several years to ensure that the center is using the best available science to accomplish its mission. However, we were unable to verify whether these reviews evaluated the related program against relevant questions in the Salmon Research Plan. During our audit, we learned that center officials were planning to review the hatchery program—one of the three areas in the Salmon Research Plan for which a multiyear plan exists. We suggested that the center use the related high-priority questions and subquestions from the Salmon Research Plan as the review's benchmarks. The center agreed to do so, and this review, scheduled for completion later in the year, should exemplify how the plan can be

used as a performance standard. We believe the center should also document its program review process and incorporate it into its standard operating procedures.

### E. Recommendations

The assistant administrator for fisheries should take the necessary actions to ensure that Northwest science center director

1. assesses and documents the extent to which existing projects support finding answers to the critical salmon research questions and subquestions;
2. modifies the annual review process to ensure that links to the Salmon Research Plan are clearly delineated, and that project approval procedures are standardized and documented;
3. implements a system to record and report on full project costs; and
4. uses the plan's questions and subquestions as performance criteria in program reviews, and document the review process.

### F. NOAA's Response to Recommendations

NOAA concurs with the recommendations. Regarding the third recommendation, the center accepts the recommendation, but would like to see the tracking system developed at the NMFS headquarters level.

OIG Comments. We agree that it may be appropriate for NMFS Headquarters to take the lead on developing this system and understand that steps to implement one are ongoing. In the meantime, the center should take steps to enhance its existing process by tracking actual costs at a project level, rather than a broader program or subtask level. These steps should not require the center to develop its own new automated system.

## V. Summary of NOAA's Response to the Draft Report

In response to the draft report, NOAA agreed with all of our recommendations and further stated that all of its NMFS science centers could benefit from undertaking similar actions. In addition, NOAA made three general comments to emphasize steps that the center has taken to build its processes for planning, implementing, and tracking research. These comments are discussed below. NOAA also made a number of specific comments that we addressed, when necessary, by adding further clarification or additional details to the report. Several of the specific comments regarding the distinction between effective processes versus documenting the processes and the extent of regional office involvement are addressed as part of our response to the three general comments. NOAA's complete response to our findings and recommendations is included as Appendix II.

NOAA General Comment #1

> The center states that it has placed considerable emphasis on the organization, planning, tracking, and accountability of its research. It noted that, while more can be done, it has had to make choices based on limited resources. The center indicated that in the future it plans on adjusting its resources to focus more on documentation of its actions; however, this rebalancing will require a shift of some resources from scientific research to administrative tasks.

OIG Comment: Improving documentation will aid in making the center's process more transparent. However, our report discusses the need to not only document processes but to make sure the processes are effective for accomplishing the results. For example, we state that the peer review process should be improved and documented, the multiyear planning process needs to be created, implemented, and documented, and that the process for managing ongoing work needs to be improved and documented. Thus, the emphasis is equally balanced on improving, as well as, documenting the process.

Regarding the need to shift resources from science to administration, we believe that the center can address our recommendations regarding peer review and managing ongoing work by opting to use its administrative staff assigned to each division, as well as other support staff responsible for administration and planning, before reassigning scientists. Regarding our recommendations related to multiyear planning, center officials have told us that they have much of the information needed to complete the plans. Given the sensitivity, complexity, and importance of salmon recovery in the Pacific Northwest, we believe this investment is warranted.

NOAA General Comment #2

> The center points out that it has put forth a significant amount of effort to give regional staff the opportunity to influence the Salmon Research Plan's content and subsequent implementation. The center lists numerous planning meetings involving the regional office from 1996 through December 2000 as evidence of its efforts to involve the regional office.

OIG Comment: We agree that the center has created opportunities to involve the regional office in the development of the Salmon Research Plan. The intent of our discussion was to emphasize the importance of regional involvement in formally reviewing the plan and implementing it using the multiyear planning process. The center has agreed to involve the region in reviewing the plan and developing multiyear plans to address all of the 10 major questions. We believe the regional office should use these opportunities to proactively participate in setting the salmon research agenda.

NOAA General Comment #3

> The center states that while peer review of the Salmon Research Plan was not documented, the vast majority of its scientific products are peer reviewed. The center also noted that the Salmon Research Plan was reviewed by the Independent Scientific Advisory Board and the Recovery Science Review Panel (a panel of scientists that

helps guide the scientific and technical aspects of recovery planning for listed salmon and steelhead species on the west coast ). The center states that a policy being developed by NMFS Science Quality Assurance Program will articulate a policy for peer review of stock assessments, scientific advice, and science programs. Finally, the center will be developing a plan to receive formal management and stakeholder review of the Salmon Research Plan. As part of this plan, the center will formally solicit comments on the Plan from its website.

OIG Comment: We agree with NMFS' steps to complete the peer review policy. We also understand and discuss in the report that many of the center's scientific products are peer reviewed and that the plan was reviewed by the Independent Scientific Advisory Board, but that this was not a formal process with written comments. According to the detailed comments provided in the center response, the center only recently found a comment provided by the Recovery Science Review Panel in March 2002. While such a comment is helpful, the fact that it come over 2 years after the issuance of the plan supports our point that a timely, formal review was not conducted after the plan was issued in December 2000.

# APPENDIX I

## Salmon Research Questions and Subquestions[1]

1. How can we identify the requirements for viability in a salmonid ESU so that we can provide quantitative goals for recovery?
   - What are the consequences for population viability analysis of making a mistake in defining the population unit(s)? What types of mistakes are the most likely and which have the most serious consequences?
   - What are the demographic and genetic consequences of dispersal among salmon subpopulations?
   - How can we evaluate viability of systems that include a composite of natural and hatchery fish?
   - To what extent does life history and/or habitat diversity increase sustainability of a population or larger conservation unit?
2. Is salmon harvest compatible with recovery of ESA listed populations?
   - Are the current indirect exploitation rates on ESA listed salmon populations limiting recovery of threatened populations?
   - Can selective gear be developed to allow harvest of hatchery and healthy stocks?
   - Can we better estimate incidental mortality rates in selective fisheries?
3. To what extent do hydropower operations contribute to the declining population trends evident in many salmon populations, and how can we quantify the benefits of major alterations in hydropower operations?
   - With respect to currently proposed or other hydrosystem operational measures, how can we improve direct survival of salmonids migrating through the hydropower system?
   - How can we identify and quantify indirect or delayed effects of hydrosystem operations on salmonid survival and fitness?
4. To what extent do hatchery operations of any kind contribute to or mitigate the risk of extinction faced by wild salmon populations?
   - Is it possible to produce juvenile fish from hatcheries that can contribute to increased natural productivity and aid in recovery of listed populations?
   - What are the impacts of releases of hatchery fish on the viability of wild salmon populations?
5. Can we establish explicit links between salmon productivity and habitat attributes that can be protected or restored via management actions?
   - What is the relationship between habitat attributes at various scales and salmonid production?
   - What is the effect of human induced habitat changes on salmonid populations?
   - What are effective restoration strategies for restoring degraded habitat and what are the quantitative effects on fish abundance?
6. Should our strategies for salmon recovery take climate change into account?
   - What features of climatic cycles and trends have the greatest influence on salmonid survival and via what mechanisms?
   - In order to accommodate severe environmental change, do we need more subpopulations of salmon than we might otherwise require?
   - Can we anticipate impacts of climate change on species with which salmonids interact that might in turn profoundly alter salmon population dynamics?
7. How do ocean and estuarine conditions and the "4-H" risk factors interact and potentially constrain opportunities for recovery?
   - Obtain a better understanding of the distribution and movement patterns of juvenile salmonid in the estuaries and the ocean.
   - Obtain a better understanding of how variation in health and physiological condition of salmonid control growth and survival in estuaries and the ocean.
   - Obtain a better understanding of trophic-dynamics and food webs important to salmonids, especially of the relative importance of top-down vs. bottom-up processes in controlling salmonid production.
8. Is there a way of making the ideal of "ecosystem and multispecies management" operational for salmon?
   - Can long-term areal closures serve as a management tool that conserves biomass, reduces disruption to system structure and protects vulnerable habitats?
   - To what extent can nutrient enhancement or predator reduction increase salmon productivity?
   - Do non-salmonid fisheries (e.g. squid, anchovy, herring, pollock, etc…) influence the dynamics of salmon populations?
9. What are the impacts of nonindigenous species on salmon and how might these impacts be mitigated?
   - What is the total collective impact of nonindigenous species on recruits per spawner and annual rates of population growth in west coast salmonids?
   - Are there pragmatic management actions that could alleviate the harm caused by nonnative species?
   - Are there incipient nonindigenous species problems that are potential future threats to wild salmon, but not out of control?
   - Can we begin to learn from these analyses what combinations of species and ecosystem processes most exacerbate the undesirable impacts of nonindigenous species in marine systems?
10. Using economic analyses to establish conservation priorities.
    - What are the likely increases in the annual rate of population growth for salmon populations as a result of well-defined, specific management actions?
    - What are the economic costs for particular management actions?
    - How can the uncertainty in cost and benefit estimates be combined in a simple and informative manner?
    - How does the analysis vary if we relax the assumption of linearity (i.e., that the benefit per dollar is a constant ratio across the entire range of demographic rates)?

[1] Some questions paraphrased for brevity.

APPENDIX II

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
CHIEF FINANCIAL OFFICER/CHIEF ADMINISTRATIVE OFFICER

SEP 26 2002

MEMORANDUM FOR: Michael Sears
Assistant Inspector General for Audits

FROM: Sonya G. Stewart

SUBJECT: OIG Draft Report: Northwest Fisheries Science Center Needs Improved Research Management Processes to Better Implement Its Salmon Research Plan Draft Report No. STD- 1440-01-0001

Attached is the National Oceanic and Atmospheric Administration's written comments concerning the draft inspection report. We appreciate the opportunity to provide comments to your draft inspection report.

Attachment

**NOAA Comments on the Draft OIG Report entitled, "Northwest Fisheries Science Center Needs Improved Research Management Processes to Better Implement Its Salmon Research Plan"**
**(STD-1440-1-0001/August 2002)**

## General Comments

In general, this is a very useful report that supports and reinforces the Northwest Fisheries Science Center's continuing efforts to improve its research planning, implementation, tracking, and review. As the report notes, the Center has taken many positive steps in the development of its Salmon Research Plan. The Center has made similar progress in the development of research plans for west coast groundfish and a new program focusing on marine mammals. Recommendations from this report and subsequent actions by Center staff will no doubt improve the Center's efficiency and effectiveness and we agree that all Science Centers and agency programs could benefit from undertaking similar actions.

While the Center agrees that it can and should improve its processes for planning, implementing and tracking research, we feel that this report does not adequately recognize the actions that the Center has taken over the past several years to build such processes and would like to make the following general comments.

1. **Product vs. Process.** The Center has placed considerable emphasis on the organization, planning, tracking, and accountability of its research. While the Center may not have focused as much attention as was needed on documenting its processes, it is important to note that the Center is operating in an environment where resources are constrained (both human and budgetary) and choices must be made about where to focus efforts. Achieving a balance between "doing" and "documenting" is always a challenge. In light of this report, the Center will adjust its balance to focus more on the documentation of its actions. We agree that this will be very useful, but without additional resources this will require shifting some of our resources from science to administration.

2. **Role of the Regional Office in Science Center Planning.** In several locations throughout the OIG report, it is noted that the Regional Office did not have an opportunity to formally review the Salmon Research Plan and that regional staff wanted to be more involved in planning salmon recovery research. While we will certainly work with regional staff to enable them to be more involved in the planning aspects of our research, it is important to recognize the significant amount of effort that Center staff put forth to give regional staff the opportunity to influence the salmon research plan's content and subsequent implementation. Over the past several years, on numerous occasions and in a number of different ways, the Center has actively engaged the Northwest Regional staff in planning its research agenda. A few key examples include:

    - Annually, beginning in 1996, staff representing the NW and SW Fisheries Science Centers and Regional Offices (along with staff from the NMFS

Headquarters) met over a 2-3 day period to review and coordinate research and management priorities, and allocate new funding that was being provided to meet the growing demands of implementing the Endangered Species Act for listed Pacific Salmon species. For these meetings, both the science centers and regional offices prepared detailed proposals describing their highest priority needs and worked together to allocate funds. Following comprehensive discussion, and adjustment where necessary, funds were allocated to the highest priority projects.

- In June 1998, the Center hosted a comprehensive Pacific Salmon Briefing in Seattle. Attending and participating were staff of the Northwest and Southwest Centers, the Northwest and Southwest Regional Offices (including both Regional Administrators), and NMFS Headquarters. During this briefing, both science centers provided overviews of their research and regional office staff provided input on their priorities. A significant amount of time was spent ensuring that science was linked to management needs. In fact, one of the topics on the agenda was the coastwide draft plan for Estuarine and Ocean Ecology of Salmon (one of the subplans of the Salmon Research Plan).

- In November 1998, the Center organized a professionally facilitated retreat between Center staff and NW regional staff to share management needs and set research and management priorities. Dr. Ulysses S. Seal, Chairman of the Conservation Breeding Specialist Group, IUCN-The World Conservation Organization facilitated the three-day retreat. The report developed from this retreat provided the impetus to develop the Salmon Research Plan.

- In December 2000, the Salmon Research Plan was presented at the annual West Coast Salmon Meeting. Staff from the NW and SW Science Centers, NW and SW Regional Offices, and NMFS Headquarters participated in this meeting. The purpose of this meeting was two-fold: 1) to review progress, and 2) allocate new funds. At this time, NW Science Center staff recommended that the Salmon Research Plan be used as the framework for prioritizing research and allocating funds; however, no follow up action was taken on this recommendation--partially because the Agency was involved in refining its Science Quality Assurance Plan.

3. **Peer Review.** While it is true that the Center's peer review of the Salmon Research Plan and the other scientific products are not routinely documented as is noted in the OIG report, it is important to recognize that the Center already uses peer review for the vast majority of its scientific products. For example, the Center frequently seeks review and guidance from two scientific advisory boards: The Independent Scientific Advisory Board[1] and the Recovery Science Review Panel[2]. Both boards are composed of academic scientists with international standing. It is also important to recognize that all Science Centers, including the Northwest Fisheries Science Center, as directed by the NMFS Assistant Administrator under the NMFS Science Quality Assurance Program,

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[1] A board established by the Northwest Power Planning Council and the NMFS to provide independent scientific advice and recommendations on issues related to regional fish and wildlife recovery programs under the Northwest Power Act and the Endangered Species Act.

[2] This consists of six highly qualified, independent scientists that help guide the scientific and technical aspects of recovery planning for listed salmon and steelhead species throughout the West Coast.

are currently preparing a stand-alone document that will clearly articulate a policy for peer review of stock assessments, scientific advice, and science programs.

In regards to the Salmon Research Plan, the Center did have the plan reviewed by independent experts. These reviews, however, were not formally documented. Two specific examples include:

- In February 2000, the Center organized a workshop at the National Center for Ecological Analyses and Synthesis in Santa Barbara, California to further define and focus the Salmon Research Plan. Outside scientists from academic institutions and other federal agencies were invited to participate to broaden the discussion and provide peer review. Attending were scientists from the U.S. Geological Survey, U.S. Environmental Protection Agency, University of Idaho, University of Oregon, and the University of California (Berkeley and Santa Cruz). The results of this meeting led to the drafting of the research elements that would help answer the 10 priority questions.

- Since its release, the Center has provided the Salmon Research Plan to the Independent Scientific Advisory Board and the Recovery Science Review Panel, with the opportunity to provide comments. As the OIG report notes, the Center received no formal written comments, but both scientific bodies indicated that the plan was an excellent summary of the important issues facing salmon recovery. In fact, the RSRP included such a statement in their meeting notes from March 2002[3] (see specific comment #26).

[3] This comment can be found at http://www.nwfsc.noaa.gov/cbd/trt/rsrp.htm.

**Specific Comments**

In general, this report nicely summarizes the work of the Center and the discussions that took place between Center and OIG staff. We do, however, have a number of specific comments to clarify specific wording and provide a broader context for some statements.

Executive Summary

1. Page i, paragraph 2. The first sentence states "NMFS' Northwest Regional Office and Northwest Fisheries Science Center are NOAA's primary organization for handling the endangered species program in the Pacific Northwest, which encompasses much of the Columbia River Basin and several other areas."

   Comment–While it is true that the Regional Office and Center's work encompasses much of the Columbia River Basin and other areas, its work is actually much broader. The Region and Center also manage and protect living marine resources in all federal waters off the Washington and Oregon coasts (from 3 nautical miles to 200 nautical miles). A suggested revised sentence is as follows: "NMFS' Northwest Regional Office and Northwest Fisheries Science Center are responsible for managing and protecting living marine resources, on behalf of NOAA, in the Pacific Northwest. As such they are responsible for a huge area that includes both inland rivers and streams where salmon migrate in Washington, Oregon, Idaho, and Montana to large stretches of the Pacific Ocean (from 3-200 nautical miles off the coasts of Washington and Oregon).

2. Page i, paragraph 2. The second to last sentence states "The center, in turn, supports the region by assessing the status of all species, and, when warranted, conducting scientific research to determine how best to protect and recover them and their habitats."

   Comment—This is just a part of what the Center does. We would like to suggest that this sentence be rephrased to say, "The Center, in turn, supports the region by assessing the status of living marine resources in the Pacific Northwest and conducting scientific research to determine how best to protect, recover, and wisely use these valuable resources."

3. Page i, paragraph 2. The last sentence states, "Much of the center's activities focus on Pacific salmon species, or "salmonids" (which include steelhead trout)."

   Comment—While this sentence is true, it is not completely accurate. The Center also has a large and rapidly growing groundfish program and conducts research on marine mammals. We would like to suggest that the sentence be rephrased to say the following: "While much of the center's activities focus on Pacific salmon species (including steelhead trout), the center also has a large and rapidly growing groundfish program and conducts research on other marine species, including marine mammals."

4. Page i, paragraph 3. The second sentence states "It is in this environment that the Northwest Fisheries Science Center strives to conduct sound scientific research to improve the status of 26 evolutionary significant units (ESUs), or populations of endangered and threatened Pacific salmon."

   Comment—The Northwest Region and Science Center are responsible for coordinating salmon recovery on the West Coast, but do not have lead responsibility for addressing all 26 listed ESUs of Pacific salmon. The Northwest Region and Science Center have responsibility for 16 of the 26 listed ESUs of salmon (i.e., those that are located in

Washington, Oregon, and Idaho). The Southwest Region and Science Center have responsibility for 9 of the 26 listed ESUs (i.e., those located in California). There is one ESU that is located on the Oregon/California border for which responsibility is shared between the Northwest and Southwest Region and Science Center.

Comment—Evolutionary significant units should be evolutionarily significant units.

5. Page i, paragraph 3. The second to last sentence states, "Located in Seattle, the center is organized into five divisions that conduct basic and applied research into specific sets of conditions that impact fish stock recovery, such as habitat, harvest, hydropower (dams), and hatcheries."

   Comment—The Center also focuses on building sustainable fisheries, including marine fisheries, and protecting and conserving freshwater, estuarine, and marine habitats. A suggested rephrasing of this sentence could be, "With its headquarters in Seattle, the Center is organized into five divisions that conduct basic and applied research that is needed to conserve and manage living marine resources and their habitats in the Pacific Northwest. In the area of salmon recovery, Center scientists conduct research on habitat, harvest, hydropower (dams), and hatcheries."

6. Page i, paragraph 4. The third sentence from the top states "With the bulk of NMFS' FY2001 funds mandated for state and tribal use, the center received $9.3 million from the appropriation and obtained the balance of its salmon budget ($14.3 million) by performing work, primarily hydropower research, for other entities under reimbursable agreements. "

7. Comment—This statement is misleading. Although NMFS receives funding from other Federal Agencies, the research conducted with this funding is for NMFS; it is not for another agency. The multiple and overlapping responsibilities for rebuilding salmon populations on the Columbia River allows NMFS to conduct mission-critical research using funds from Federal partners. This sentence could be rephrased to, "With the bulk of NMFS' FY2001 funds mandated for state and tribal use, the center received $9.3 million from the appropriation and obtained the balance of its salmon budget ($14.3 million) through reimbursable agreements with other federal agencies. "

8. Page ii, paragraph 2. The second sentence states, "Given the center's years of research activity into the status of salmon species, this lack of information was a cause for concern and prompted the center to develop the Salmon Research Plan."

   Comment—It is important to note that in the development of the Salmon Research Plan, the Center not only considered the research that it had conducted over the years, it also considered research that had been conducted by other agencies, organizations, and universities. With regards to its own research, it is important to note that the Center was not able to grow in certain research areas for many years, such as ocean ecology, because of limited agency resources. A more accurate statement might be, "Given the number of salmon research projects that had been conducted over the years, often in specific targeted areas, this lack of critical information was a cause for concern and prompted the Center to develop the Salmon Research Plan."

9. Page ii, paragraph 4. The second sentence states, "The Salmon Research Plan establishes the center's salmon research goals and priorities, supports NMFS' strategic goal to recover and maintain protected species, and was shared with other NMFS organizations.

   Comment—While salmon research at the Center is primarily targeted toward salmon recovery there are small pockets of research in other areas related to salmon, such as harvest management for non-listed ESUs. A more accurate statement would be, "The Salmon Research Plan establishes the center's salmon research goals and priorities for salmon recovery, supports NMFS' strategic goal to recover and maintain protected species, and was shared with other NMFS organizations."

10. Page iii, paragraph 2. The second sentence states, "Despite the many positives of the Salmon Research Plan, its true value.....:"

    Comment—It is important to note that while the Center did not put the Salmon Research Plan through a formal or rigorous, documented peer review process, it did organize and convene a number of meetings and workshops to receive feedback and input on the plan. This sentence could be rephrased as follows, "Despite the many positives of the Salmon Research Plan and a number meetings and workshops that were held to receive feedback on the plan, its true value..."

11. Page iv, paragraph 1. The last sentence of the paragraph states "In addition, NMFS Northwest regional managers, who benefit from the center's research, have had limited formal involvement in decisions related to the Salmon Research Plan."

    Comment—As described in general comment #2, this statement is not accurate. NMFS Northwest regional managers were involved in a number of workshops and meetings that were directly related to the development of the Salmon Research Plan. While formal comments may not have been solicited by Center staff, regional managers certainly had opportunities to provide comments on the Salmon Research Plan. A more accurate statement might be, "While the Center did engage NMFS Northwest regional managers in the development of the Salmon Research Plan, there was no formal request for regional staff review of the plan."

12. Page v, paragraph 4. The second sentence states, "The Salmon Research Plan requires that only those projects that "contribute in a major way to answering one of these key questions" be given priority.

    Comment– This sentence does not accurately reflect the intent of what was written in the Salmon Research Plan. Because the Center receives funding from reimbursable sources, as well as directed funding (i.e., for a specific purpose), it is challenging for the Center to work solely on those projects that "contribute in a major way to answering one of these key questions." We suggest changing the first sentence to the following: "The Salmon Research Plan challenges the Center to carefully evaluate its research projects and focus on those projects that "contribute in a major way to answering one of these key questions."

**Introduction**

13. Page 1, paragraph 2. The last sentence of the paragraph states, "Regional science centers, in turn, support these policies by assessing the status of species at risk for significant population loss and by conducting research to determine optimal strategies for protecting and recovering them and their habitats."

    Comment—Please see specific comment #2.

14. Page 1, paragraph 3. The second sentence states, "The Endangered Species Act requires the U.S. Fish and Wildlife Service and NMFS to determine whether to add a species to the federal lists of endangered and threatened wildlife and plants."

    Comment—This sentence is unclear. The U.S. Fish and Wildlife Service and NMFS have responsibility for different species under the ESA. A more accurate statement would be, "The Endangered Species Act requires the U.S. Fish and Wildlife Service or NMFS, depending on the species, to determine whether to add a species to the federal lists of endangered and threatened wildlife and plants."

15. Page 1, paragraph 3. 4th sentence.

    Comment—This sentence could use further clarity (see specific comment #14). A suggested revision is, "In addition, ESA requires all federal agencies to protected threatened and endangered species and to consult with the U.S. Fish and Wildlife Service or NMFS, depending on the species, to ensure that ....."

16. Page 1, paragraph 4. The last sentence on this page states, "It is in this environment that the Northwest Fisheries Science Center strives to conduct sound scientific research to improve the status of 26 evolutionary significant units (ESUs) of endangered and threatened Pacific salmon."

    Comment—Please see specific comment #4.

17. Page 2, paragraph 1. The first sentence states, "Located in Seattle, the center provides scientific support to NMFS' Northwest Regional Office and serves an area that encompasses the Columbia River Basin."

    Comment—This statement does not capture the breadth of the Center's work. While the Center primarily provides scientific support to NMFS' Northwest Regional Office, it also provides scientific information to other decision-makers in the Pacific Northwest. The Center also works in areas outside the Columbia River basin (see specific comment #1). A revised sentence could read as follows: "With its headquarters in Seattle, the Center conducts basic and applied research that the NMFS' Northwest Regional Office and other decision-makers need to conserve and manage living marine resources and their habitats in the Pacific Northwest, including the Columbia River Basin and ocean areas off the Washington and Oregon coasts."

18. Page 2, paragraph 1. The second sentence states, "The center's research is largely devoted to understanding the complexities of salmon biology and ecology, and has a diverse focus....."

Comment– The Center also has a large and rapidly growing groundfish program and conducts research on marine mammals. We would like to suggest that the sentence be revised to the following: "The Center's research on salmon is largely....

19. Page 2, paragraph 2. The first sentence states, "The center is organized into five divisions that conduct basic and applied research into specific sets of conditions that impact fish stock recovery."

Comment–The Center also focuses on building sustainable fisheries, including marine fisheries, and protecting and conserving freshwater, estuarine, and marine habitats. A suggested rephrasing of this sentence could be, "The Center is organized into five divisions that conduct basic and applied research that is needed to conserve and manage living marine resources and their habitats in the Pacific Northwest."

**Objectives, Scope, and Methodology**

20. Page 3, top of page. The first sentence on the top of the page (starting on page 2) states, "It obtained the balance of its salmon budget ($14.3 million) by performing work, primarily hydropower research, for other entities under reimbursable agreements. "

21. Comment—This statement is misleading. Although NMFS receives funding from other Federal Agencies, the research conducted with this funding is for NMFS. The multiple and overlapping responsibilities for rebuilding salmon populations on the Columbia River allows NMFS to conduct mission-critical research using funds from Federal partners. A suggested revision for this sentence is as follows, "It obtained the balance of its salmon budget ($14.3 million) through reimbursable agreements with other federal agencies. "

22. Page 3, paragraph 2. The second sentence states, "Given the center's years of research activity into the status of salmon species, this lack of information was a cause for concern and prompted the center to develop the Salmon Research Plan."

Comment—In the development of the Salmon Research Plan, the Center not only considered the research that it had conducted over the years, it also considered research that had been conducted by other agencies, organizations, and universities. With regards to its own research, it is important to note that the Center was not able to grow in certain research areas for many years, such as ocean ecology, because of limited agency resources. A more accurate statement might be, "Given the number of salmon research projects that had been conducted over the years, often in specific targeted areas, this lack of critical information was a cause for concern and prompted the Center to develop the Salmon Research Plan."

23. Page 4, paragraph 2. The last sentence in the paragraph states that "Overall, we found that the science center did not have effective policies and procedures for ensuring the adequacy of its peer review, planning, and program review processes."

Comment—Having effective policies and procedures is different than documenting policies and procedures. The Center has processes and procedures in place for its technical memoranda and scientific papers, but needs to strengthen its documentation of these processes. The Center needs to develop effective policies and procedures for the peer review of its research plans. Accordingly, the above sentence should be revised. Suggested wording for this sentence is as follows: "Overall, we found that the science

center did not have adequate documentation of its policies and procedures for ensuring the adequacy of its peer review and program reviews, and in the case of its research plans, the Center needs to develop and implement policies and procedures."

**Findings and Recommendations**

24. Page 6, paragraph 1. The second sentence from the end of the paragraph states that "The Northwest science center did not subject the Salmon Research Plan to a formal peer review—largely because it has no formalized process for such plans."

    Comment—While the Center did not subject the plan to a formal review the Center did get feedback on the plan from outside scientists from academic institutions and other federal agencies. The Center also provided the plan to the Independent Scientific Advisory Board and the Recovery Science Review Panel. Both scientific bodies indicated that the plan was an excellent summary of the important issues facing salmon recovery (see page 5 of the RSRP report from March 2002 at http://www.nwfsc.noaa.gov/cbd/trt/rsrp.htm). We suggest the following, "While the Center received feedback on the plan from several highly-qualified scientific bodies, the Center did not subject the Salmon Research Plan to a formal peer review."

25. Page 6, paragraph 2. The first sentence states, "Despite the many positives of the Salmon Research Plan, its true value.....:"

    Comment—See specific comment #10. This sentence could be rephrased as follows, "Despite the many positives of the Salmon Research Plan and a number of meetings and workshops that were held to receive feedback on the plan, its true value..."

26. Page 6, paragraph 4. The first sentence states that "We asked staff to provide us with documentation of this review process and the comments that resulted, but they could not produce any."

    Comment—The Center has since located a statement by the Recovery Science Review Panel (the panel of distinguished scientists that helps guide the scientific and technical aspects of recovery planning) commending the plan. During its March 2002 meeting, the RSRP stated, "The NWFSC produced an excellent document on research needs (the "Salmon Research Plan," Vols I & II)." This statement can be found on page 5 of the RSRP report from March 2002 at http://www.nwfsc.noaa.gov/cbd/trt/rsrp.htm.

27. Page 7, paragraph 3. The 4th sentence states, "Staff stated that they had begun developing an internal quality standard to detail the level and type of review the center would conduct for different products, but did not complete it."

    Comment—This statement does not adequately summarize what happened. The reason that the Center's effort was stopped was because NMFS Headquarters wanted to assess all of the Center's programs under the Science Quality Assurance Program before additional actions were taken. The Center is now implementing actions under the Science Quality Assurance Program to ensure that all of its products and proposed activities receive the appropriate level and type of peer review and that actions are documented.

28. Page 9, paragraph 2. The second sentence states, "However, it did create a staff position with responsibility for implementing the Salmon Research Plan—salmon senior scientist—and assigned the director of one of its divisions to the post."

Comment—This statement is misleading. A new staff position was not created; rather a new responsibility was delegated to a current division director. This statement could be rephrased as follows, "However, it did assign responsibility for implementing the Salmon Research Plan—with the title of salmon senior scientist—to one of its division directors."

29. Page 10, paragraph 1. The second sentence states that "He explained that he did not recognize the value of multiyear plans and allowed division directors to decide how to answer questions on their own."

Comment—This sentence is not accurate and should be deleted. Every Center manager recognizes the value of multiyear plans (this is noted in paragraph 3). We can only speculate that this statement originated from a misinterpretation of the Center's responses to a series of questions about the roles and responsibilities of the salmon senior scientist. One part of that response was that the position is advisory (i.e., there is no delegation of supervision, and no authority to allocate funds or FTEs). Hence, while the senior salmon scientist can work with the division directors and assist in coordination among programs, in the end the division directors set their research agendas. Another part of the response touched on the difficulties associated with developing meaningful multiyear research plans because of the nature of research. None of this indicates that the salmon senior scientist did not recognize the value of multiyear research plans.

30. Page 11, section B, paragraph 1. The third and fourth sentences state that "They reportedly reviewed the plan initially and thought the questions were on target, but have only been involved in helping develop the three existing multiyear plans. Seven questions remain for which they have had no formal input regarding related center research and regional office needs."

Comment—Not only did regional staff review the plan, they also participated in a number of meetings and workshops that either formed the foundation for this plan or were a forum for discussing the plan (see general comment #2). With regard to the seven questions for which there is no research plan, it is premature to state that there has been no formal input because the Center has not begun to develop these plans. We suggest that this sentence be deleted and that the first sentence be modified as follows: "They participated in several meetings and workshops related to the plan and reportedly reviewed the plan initially and thought that the questions were on target. NMFS regional managers were involved in helping to develop the three existing multiyear plans."

31. Page 12, Section A, paragraph 1. The third sentence from the end states that "However, she noted that neither this analysis nor the resulting decision have ever been documented because it seemed unnecessary to do so."

Comment—While it is true that managers have a good handle of which projects are proceeding successfully and which are not, the lack of formal documentation is a function of workload and resources—not "because it seemed unnecessary to do so." The phrase "because it seemed unnecessary to do so" is not accurate and should be deleted.

NOAA Response to OIG Recommendations

**The OIG states, "We recommend that The Assistant Administrator for Fisheries should take the necessary actions to ensure that:"**

**Recommendation 1:**

1. NMFS headquarters revises the *Science Quality Assurance Program, Fisheries Science Center Accreditation Standards*, to clearly require science centers to develop documented peer review processes.

2. Northwest Fisheries Science Center managers
   - Document existing peer review processes,
   - Develop a peer review process for research plans that includes a step for obtaining formal comments, and
   - Use this new process to conduct a formal review of the Salmon Research Plan

**NOAA Response:** We concur.

1. NMFS headquarters accepts this recommendation. Implementation of this recommendation is already underway. NMFS headquarters has required all of the Science Centers, as part of the Science Quality Assurance Program, Fisheries Science Center Accreditation Standards, to prepare a stand-alone document that will clearly articulate a policy for peer review of stock assessments, scientific advice, and science programs.

2. The Northwest Fisheries Science Center accepts this recommendation. As stated in the response to recommendation #1.1, the Northwest Science Center is creating a document that will clearly articulate its current and future peer review policies. This document will include a peer review process for research plans that includes a step for obtaining formal comments. The Center expects to complete this policy by June 2003.

   With regards to the Salmon Research Plan, the Center will be developing a plan to receive formal stakeholder and management review, which may include one or more workshops, as necessary. As part of this plan, the Center will formally solicit comments via its website, where the Salmon Research plan is currently posted.

**Recommendation 2:**

National Marine Fisheries Service regional and center management establish a consistent method for involving the Northwest Regional Office and other stakeholders in developing strategies to achieve the goals of all 10 research questions, and should require the center director to do the following:

1. Develop multiyear plans that clearly delineate 1) research projects and priorities; 2) staff and funding requirements; 3) project milestones; 4) roles and responsibilities of significant partners; and 5) interim performance measures that link to long-term strategic goals.

2. Work with the Northwest Regional Office to identify potential sources of funding for research projects in the multiyear plans.

3. Follow appropriate peer review processes and document the results.

**NOAA Response:** We concur. The Assistant Administrator for Fisheries will work with NMFS regional and Center management to establish a consistent method for involving the Northwest Regional Office and other stakeholders in developing strategies to achieve goals of all 10 research questions. NMFS headquarters will also evaluate and make recommendations concerning the application of these requirements, for developing and implementing multiyear plans, for other major programs throughout NMFS.

1. The Center accepts this recommendation and will develop multiyear plans for each of the ten questions outlined in its Salmon Research Plan. These plans will delineate 1) research projects and priorities; 2) staff and funding requirements; 3) project milestones; 4) roles and responsibilities of significant partners; and 5) interim performance measures that link to long-term strategic goals. As the OIG report notes, while not complete, the Center has already started the process of developing multiyear plans.

2. The Center accepts this recommendation. As outlined in general comment #2, the Center has worked closely with the Regional Office in the development of the Salmon Research Plan and agrees that it would be useful to work with the Regional Office to identify potential sources of funding for research projects included in multiyear plans. The Center will resume conducting an annual workshop/retreat with regional staff to review research and operational priorities, review progress towards those priorities, and explore new funding opportunities. This annual workshop will also enable the Regional office to summarize and review their priorities, and review their use of science in meeting management and regulatory responsibilities.

3. The Center accepts this recommendation and will continue to follow appropriate peer review processes for its research and multiyear plans and work on improving its documentation of these processes. The documentation of these processes is addressed under our response to recommendation #1 on the previous page.

**Recommendation 3:**

The Northwest Science Center director:

1. Assesses and documents the extent to which existing projects support finding answers to the critical salmon research questions and subquestions;

2. Modifies the annual review process to ensure that links to the Salmon Research Plan are clearly delineated, and that project approval procedures are standardized and documented;

3. Implements a system to record and report on full project costs; and

4. Uses the plan's questions and subquestions as performance criteria in program reviews, and document the review process.

**NOAA Response:** We concur. The Assistant Administrator for Fsheries will ensure that the NWFSC takes the recommended actions based on standards and procedures that are being developed by the NMFS Science Quality Assurance Program and by criteria developed by the NMFS Office of Management and Information. As a result, NWFSC processes will be similar to those applied to other Agency programs.

1. The Northwest Fisheries Science Center accepts this recommendation and will document the linkage between existing research projects and the Salmon Research Plan, using standards and procedures developed by NMFS headquarters.

2. The Center accepts this recommendation and will conduct annual reviews of all research projects to ensure satisfactory progress is being made toward the objectives and milestones, and to ensure continued linkage to the Salmon Research Plan. This process will be documented using the NMFS Science Quality Assurance Program, once it is finalized.

3. The Center accepts this recommendation, but would like to see the tracking system developed at the NMFS Headquarters level. The development of a tracking system takes a considerable amount of resources and implementing such a system on a larger scale would benefit other programs and result in more cost efficiencies.

4. The Center accepts this recommendation to use the Salmon Research Plan's questions and subquestions as performance criteria in program reviews, and to document the review process. In the Center 's upcoming program reviews, planned for FY02 and FY03, the prominent criterion for assessing the relevance of program activities will be the degree to which the research addresses the questions posed by the Salmon Research Plan.