

**NWR-CRFPO Workshop 2007**

A report on a workshop between National Wildlife Refuges in Region 1  
and the Columbia River Fisheries Program Office

April 25, 2007

Vancouver, Washington

Columbia River Fisheries Program Office  
U.S. Fish and Wildlife Service  
1211 S.E. Cardinal Court, Suite 100  
Vancouver, Washington 98683-9684

October 2007

Table of Contents

**EXECUTIVE SUMMARY ..... 3**

**I. BACKGROUND..... 4**

**II. NWR-CRFPO WORKSHOP 2007..... 5**

**A. CRFPO RESULTS AND ACTIVITIES DURING PAST 20 MONTHS..... 5**

*1. Abundance and Trend of Chum Salmon in Columbia Gorge Tributaries ..... 5*

*2. Assessment of Salmonid Populations and Habitat on Tenasillahe and Welch Islands..... 6*

*3. Malheur NWR Donner und Blitzen River Habitat Restoration Project ..... 6*

*4. Nestucca Bay NWR Habitat Restoration Project..... 6*

*5. Hanford Reach National Monument: Instream Flow and Habitat Assessments ..... 7*

*6. Assessment of Habitat Restoration at Bandon Marsh NWR..... 7*

*7. Julia Butler Hansen National Wildlife Refuge: Assessment of Fishes, Habitats, and Tidegates in Sloughs on the Mainland ..... 7*

*8. CRFPO Fisheries Assistance for National Wildlife Refuges..... 7*

**B. NWR UPDATES AND NEW ISSUES AND NEEDS ..... 8**

*1. Malheur NWR..... 8*

*2. Willapa NWR..... 8*

*3. Ridgefield NWR..... 9*

*4. Oregon Coast NWRs ..... 9*

*5. Julia Butler Hanson NWR ..... 9*

*6. Tualatin NWR ..... 10*

**C. REGIONAL PROGRAMS AND ISSUES..... 10**

**III. ACTION ITEMS ..... 11**

**IV. APPENDICES..... 14**

## **Executive Summary**

On April 25, 2007, the Columbia River Fisheries Program Office (CRFPO) hosted a day-long workshop with National Wildlife Refuges (NWRs). The goal of the workshop was to provide a forum to promote effective information exchange and facilitate a working relationship between NWRs and the CRFPO. Specific objectives were to:

1. Update NWRs about results and activities by the CRFPO to address aquatic resource issues and needs during the past 20 months.
2. Update CRFPO about aquatic resource issues and needs of NWRs discussed previously and present new ones.
3. Explore additional possibilities for cooperative efforts between NWRs and CRFPO.
4. Develop 2007 workshop document with action items.
5. Schedule 2008 Workshop.

The purpose of the workshop was to build upon efforts initiated at the first workshop in 2005. The second workshop was organized according to three main sessions: 1) CRFPO results and activities during the past 20 months; 2) NWR updates and new issues and needs; and 3) Regional programs and issues. The intent of the first session was to provide current updates and results of projects. Personnel from the CRFPO made eight presentations concerning activities at NWRs since the initial workshop. These included results and upcoming activities planned for ongoing projects, as well as the anticipated activities of recently initiated or planned new projects. The intent of the second session was to provide an opportunity for NWRs to update the status of aquatic resource issues and needs identified during the 2005 workshop and discuss new needs that may have arisen during the past 20 months. Personnel representing six NWRs or complexes discussed various aquatic resource issues and associated needs. The intent of the third session was to provide an opportunity to discuss regional-scale programs and issues relevant to facilitating a working relationship between NWRs and the CRFPO. This session benefited from the additional participation by personnel from Ecological Services. The overall focus concerned the nature of one of the most prevalent NWR aquatic resource needs (i.e., monitoring and evaluation for habitat management and restoration), and how to address needed funding and accomplishment reporting in a cross-program manner. An action item requesting a discussion of this issue at the Regional level with Assistant Region Directors was developed.

This report summarizes the 2007 NWR-CRFPO workshop in four sections: 1) Background, which provides context relative to the initial workshop; 2) 2007 NWR-CRFPO Workshop, which reports on each of the three workshop sessions; 3) Action Items, which include activities for ongoing and planned projects, and actions specifically discussed at the workshop; and 4) Appendices of supporting materials.

## I. Background

Because of efforts to increase interactions between Service programs and complementary missions of National Wildlife Refuges (NWRs) and the Columbia River Fisheries Program Office (CRFPO), the CRFPO hosted a day-long workshop with NWRs<sup>1</sup> and representatives of programs from the regional office in July 2005. The goal of the workshop was to provide a forum to promote effective information exchange between NWRs and the CRFPO. The intent of exchanging information was to improve familiarity between programs, identify immediate aquatic resource issues and needs at NWRs, and explore opportunities and strategies for the programs to cooperatively work toward addressing resource issues and needs. The resulting report<sup>2</sup> summarizes information presented at the workshop, as well as describes approaches NWRs and the CRFPO intend to use in working together.

Since the initial workshop in 2005, NWRs and the CRFPO have been cooperatively working on several ongoing and new monitoring and evaluation projects, providing technical assistance on various issues, assisting in the development of Comprehensive Conservation Plans (CCPs), and pursuing various funding sources to address aquatic resource needs. Nine proposals to address NWR aquatic resource needs were entered into the Fisheries Operating Needs (FONS) Module of the Fisheries Information System for consideration of Service funding as a result of the workshop. As of March 2007, the CRFPO has submitted a total of 30 active FONS proposals directly related to NWR aquatic resource needs, which include proposals developed prior to and after the initial NWR-CRFPO workshop (Appendix A).

Because a formal and regular exchange of information encourages continued cooperative efforts to work together between programs in addressing mutual goals and resource issues and needs, holding annual workshops is an efficient approach to exchange the most current information. Although logistical constraints with timing and schedules prevented organizing a workshop in 2006, the second NWR-CRFPO workshop was held in April 2007. This report summarizes topics and discussions from the second workshop, and provides action items and other supporting materials in appendices.

---

<sup>1</sup> Primarily NWRs within the CRFPO geographic area of responsibility (i.e., Columbia River basin below McNary Dam, Oregon waters excluding the Klamath River basin, small tributaries of Willapa NWR).

<sup>2</sup> Available at: <http://www.fws.gov/columbiariver/programs/refuge/refuge.htm>

## II. NWR-CRFPO Workshop 2007

The intent of the 2007 workshop was to build upon efforts initiated at the first workshop with the goal of providing a forum to promote effective information exchange and facilitate a working relationship between NWRs and the CRFPO. Five objectives were addressed:

1. Update NWRs about results and activities by the CRFPO to address aquatic resource issues and needs during the past 20 months;
2. Update CRFPO about aquatic resource issues and needs of NWRs discussed previously and present new ones;
3. Explore additional possibilities for cooperative efforts between NWRs and CRFPO;
4. Develop 2007 workshop document with action items; and
5. Schedule 2008 Workshop.

The workshop was organized according to three main sessions to accomplish objectives (see agenda—Appendix B): 1) CRFPO results and activities during the past 20 months; 2) NWR updates and new issues and needs; and 3) Regional programs and issues. This portion of the workshop report summarizes each of the three sessions. The attendance list (Appendix C) and workshop notes (Appendix D), compiled by Jerry Finley and Sam Lohr (CRFPO), are also included.

### A. CRFPO Results and Activities During Past 20 Months

The intent of this session was to provide current updates and results of projects. Personnel from the CRFPO made presentations (Appendix E) concerning activities at NWRs since the initial workshop. Several presentations provided current results of ongoing projects and planned activities, whereas others focused on recently initiated or planned new projects. The following are brief summaries of each presentation.

#### *1. Abundance and Trend of Chum Salmon in Columbia Gorge Tributaries* (Jeff Johnson)

Hardy Creek is located at Pierce NWR, and contains spawning habitat used by listed (threatened) chum salmon. The CRFPO has consistently monitored adult and juvenile chum salmon abundance in Hardy Creek since 1997, and in Hamilton Springs, a spawning channel constructed near the NWR, since 1999. Bonneville Power Administration (BPA) has funded this work to investigate factors affecting chum salmon in the streams, fish movement between the Columbia River and tributaries, and approaches to enhance production. The project is contributing to a time series of fish abundance, characterizing spawning habitat, and evaluating feasibility of operating the artificial spawning channel at Pierce NWR. Funding from BPA will likely end after FY07. Continuation of monitoring chum salmon and assessing habitat restoration opportunities at Pierce NWR was identified as an immediate need during the 2005 workshop.

**2. *Assessment of Salmonid Populations and Habitat on Tenasillahe and Welch Islands*** (Jeff Johnson)

Tenasillahe and Welch islands are adjacent portions of Julia Butler Hansen and Lewis and Clark NWRs, respectively. As part of the Lower Columbia River Channel Improvement Project, the U.S. Army Corps of Engineers (Corps) is modifying tidegates at Tenasillahe Island intended to benefit juvenile anadromous salmonids by providing access to sloughs behind the island's dikes. The Corps funded the CRFPO to evaluate tidegate operation and describe habitat and fish presence and distribution in sloughs on Tenasillahe Island and at Welch Island, which lacks dikes and tidegates. These data constitute a baseline to which data collected after construction will be compared to evaluate the effects of restoration activities using a before-after control-impact design. The Corps funded surveys in 2005 (pilot work) and 2006 (full complement). Partial funding was provided by the Corps in 2007, and a full complement of work is being made possible with additional funding from a Challenge Cost Share Grant from Refuges and funding from R1 Fisheries. Tidegates will be modified during summer 2007, and the CRFPO expects that funds from the Corps will be available for post-construction surveys. Assessing habitats and fish in sloughs to evaluate strategies for modifying tidegates and opportunities to create fish passage at Julia Butler Hansen NWR was identified as an immediate need during the 2005 workshop.

**3. *Malheur NWR Donner und Blitzen River Habitat Restoration Project*** (Mike Hudson)

Malheur NWR conducted a habitat improvement project in the Donner und Blitzen River, which included riparian vegetation plantings and placement of root wads and rock weirs in the stream, to increase habitat complexity for redband trout and other native fishes. The CRFPO has conducted habitat, fish, and aquatic invertebrate surveys once before (2001) and twice after (2003 and 2005) construction of the habitat project with funding from Malheur NWR. Qualitatively, the habitat improvement project has increased habitat diversity, which was indicated by an increase in fish species diversity after construction and between river reaches with and without habitat improvement structures. Alternate sampling approaches may have been more appropriate for habitats in the river. Restoring habitats in the Donner und Blitzen River at Malheur NWR was identified as an immediate need during the 2005 workshop.

**4. *Nestucca Bay NWR Habitat Restoration Project*** (Mike Hudson)

Nestucca Bay NWR is restoring over 80 acres of tidal wetland habitats by removing a dike and tidegate, which is scheduled for construction during summer 2007. The CRFPO received funding from the National Fish and Wildlife Foundation to evaluate physical and biological responses to the habitat restoration project during a two-year period (winter-early summer 2007 for pre-construction period and fall 2007-summer 2008 for post-construction period). Data collected by the Siletz Tribe will contribute to characterizing the pre-construction period. Pilot work has been completed to establish fish sample sites and test fish sampling methods, which will consist of systematic sets of hoop nets. Existing GIS data (e.g., elevations and terrain model) are being used to describe physical attributes for pre-construction conditions. Baseline habitat and aquatic species

information, as well as pre-construction monitoring, at Nestucca Bay NWR were identified as immediate needs during the 2005 workshop.

**5. Hanford Reach National Monument: Instream Flow and Habitat Assessments** (Joe Skalicky)

The CRFPO has conducted instream flow and habitat assessments at the Hanford Reach National Monument to develop quantitative tools for evaluating the effects of flow regulation on Chinook salmon. State-of-the-art survey and analytic methods were used to develop a bathymetric surface and hydraulic model of the reach, assess chinook salmon spawning and rearing habitat, and evaluate stranding and entrapment of juvenile salmon. These assessments have assisted in FERC re-licensing proceedings. Studies focused on adult salmon escapement and juvenile stranding are continuing with funding from Washington Department of Ecology. Methods and approaches used for this project can be easily applied to other wildlife species to address a variety of issues, such as dike or dam removal, irrigation withdrawals, drawdown assessments, habitat restoration, flooding, and exotic species.

**6. Assessment of Habitat Restoration at Bandon Marsh NWR** (Sam Lohr)

Bandon Marsh NWR is planning to restore over 400 acres of tidal wetland habitats by removing dikes and tidegates, and potentially implementing other habitat restoration actions at the Ni-les'tun Unit. The unit includes the lower portions of three small streams. Providing fisheries assistance presents an opportunity to demonstrate several aspects of the Service's strategic vision and direction, as well as highlights the role of monitoring and evaluation in habitat restoration planning and implementation. Cross Program Results (CPR) funds from Refuges will be provided to the CRFPO and Siletz Tribe to collaboratively conduct habitat, fish, and aquatic invertebrate work focused on one of the small streams, Fahy Creek. Baseline habitat and aquatic species information, as well as pre-construction monitoring, at Bandon Marsh Bay NWR were identified as immediate needs during the 2005 workshop.

**7. Julia Butler Hansen National Wildlife Refuge: Assessment of Fishes, Habitats, and Tidegates in Sloughs on the Mainland** (Jeff Johnson)

The Corps is conducting a feasibility study for modifying existing tidegates and installing new ones on sloughs isolated from the Columbia River by dikes, as well as conducting riparian vegetation restoration on the mainland unit of Julia Butler Hansen NWR. An intent of the work is to improve fish passage and habitat conditions in sloughs, which provide potential rearing habitat for juvenile anadromous salmonids. The Corps recently funded the CRFPO to monitor and evaluate tidegate operation and describe aquatic habitat and fish presence and distribution in sloughs to establish baseline conditions prior to construction. Reference sites have been identified in sloughs on islands without dikes adjacent to the mainland unit. Assessing habitats and fish in sloughs to evaluate strategies for modifying tidegates and opportunities to create fish passage at Julia Butler Hansen NWR was identified as an immediate need during the 2005 workshop.

**8. CRFPO Fisheries Assistance for National Wildlife Refuges** (Sam Lohr)

During the 2005 workshop, NWRs identified several immediate needs concerning aquatic resources. Categories of needs included: 1) Support for CCP development and associated step-down plans; 2) General technical assistance; 3) General survey and assessment; 4) NWR or issue specific needs; and 5) Needs determined to be outside of CRFPO purview. For the first three categories, the CRFPO has been participating on extended teams for CCPs, and attempting to address general technical assistance and survey and assessment needs with existing resources. Although FONS proposals to address NWR issues and needs have been submitted for funding consideration, alternate sources of funding for proposals are continuing to be explored. The CRFPO intends to continue scoping to identify a watershed associated with a NWR as a candidate area to conduct a watershed demonstration project.

## **B. NWR Updates and New Issues and Needs**

The intent of this session was to update the status of aquatic resource issues and needs at NWRs that were identified during the 2005 workshop (Appendix F) and identify new needs that may have arisen during the past 20 months. Personnel from each NWR discussed their issues and needs, which are summarized below.

### **1. Malheur NWR**

#### *Issues*

Malheur NWR entered into a settlement agreement with Oregon Department of Fish and Wildlife (ODFW) and WaterWatch of Oregon on a water rights application. The application is to divert water from the Donner und Blitzen River during winter for wetland management. The settlement agreement has stipulations in four areas: Water quantity and measurement; Water quality monitoring plan; Sufficient fish passage and screens; and Study of instream flows and habitat actions to maintain and restore redband trout. Malheur NWR and R1 Water Resources are working with ODFW and WaterWatch to meet requirements of the settlement agreement. Because specific goals and objectives have not been defined, it is difficult to determine appropriate approaches (e.g., modeling habitat capacity) for the redband trout study. Relative to common carp at Malheur NWR, negative effects carp have on wetlands and birds are not apparent when carp densities are below 200 pounds/acre. Malheur NWR views engineering (e.g., screens, barriers) as the most appropriate approach to address the problems with carp.

#### *Needs*

- Representative from CRFPO to assist with design of redband trout flow study and all questions dealing with fish for the water rights settlement agreement.

### **2. Willapa NWR**

#### *Issues*

Over the years, Willapa NWR has planted coastal cutthroat trout in streams at the NWR with the intent of establishing new runs. Sources of the fish were State hatcheries in the area where cutthroat trout entered collection facilities for adult fish. It is not known whether the introductions have been successful in establishing runs in the streams. Willapa NWR is planning to conduct surveys for freshwater mussels and considering introducing mussels into streams where they do not presently occur. Preparation of the



CCP is scheduled to begin soon, and there are recently acquired properties with aquatic habitats that have not been surveyed.

*Needs*

- Assistance in determining whether cutthroat trout planted in Long Island and Headquarters creeks are still in the streams.
- Technical assistance concerning mussel surveys and introductions.
- Training for conducting aquatic habitat surveys.

**3. Ridgefield NWR**

*Issues*

In partnership with Washington State University Extension and others, Ridgefield NWR is supporting the Gee Creek Restoration Project and a Watershed Coordinator. Activities that the Watershed Coordinator is involved include: Engaging community groups in watershed planning and restoration; Compiling historical information and data on Gee Creek in a review document; and Conducting activities for development of a watershed assessment. Ridgefield NWR is also developing its CCP.

*Needs*

- Continued involvement in developing watershed assessment for Gee Creek and information on stream reaches at Ridgefield NWR.
- Information on fish and habitats in Campbell Slough and Post Office Lake.
- Feasibility of installing tidegates in Campbell Slough.

**4. Oregon Coast NWRs**

*Issues*

The three marine NWRs in the complex (Oregon Islands, Cape Meares, and Three Arch Rocks) are developing CCPs. Once these are complete, work will begin on CCPs for the three coastal-estuarine NWRs (Bandon Marsh, Nestucca Bay, and Siletz Bay). Construction of the restoration project at Nestucca Bay NWR is scheduled to begin in July. Planning is continuing for the restoration project at Bandon Marsh NWR. The coastal-estuarine NWRs have existing tidegates for which it would be beneficial to have additional information on their operation and associated effects on fish and aquatic habitats.

*Needs*

- Evaluation of existing tidegates at coastal-estuarine NWRs.
- Assistance with CCPs for coastal-estuarine NWRs.
- Assistance with issues and needs identified during workshop in 2005.

**5. Julia Butler Hanson NWR**

*Issues*

This summer, the Corps is scheduled to modify tidegates on Tenasillahe Island to improve fish passage and habitat in sloughs. The Corps is also conducting a feasibility study for modifying tidegates and creating new points of fish access to sloughs, as well as riparian habitat restoration, on the mainland unit. The CRFPO is involved in monitoring

and evaluation of these projects. Comprehensive Conservation Plans are being developed for both Julia Butler Hansen and Lewis and Clark NWRs.

#### *Needs*

- Continuation of ongoing projects to evaluate fish relative to tidegates and slough habitats.
- Integration of freshwater mussels in ongoing projects.
- More in-depth evaluation of potential to restore habitat in Risk Creek.

### **6. Tualatin NWR**

#### *Issues*

Tualatin NWR is partnering with Metro to start habitat restoration work in the historical lakebed at the recently approved Wapato Lake Unit. Initial work will likely involve retrofitting the water delivery system and constructing screens. Relative to the proposal to raise the height of Scoggins Dam, the water user groups are exploring options to purchase the facility. Involvement by ODFW and Ecological Services in the project has primarily focused on potential habitat loss in the areas upstream of the dam. Tualatin NWR is concerned about potential effects on river flows and habitats downstream of the dam.

#### *Needs*

- Assistance with issues and needs identified during workshop in 2005.
- Assistance in tracking potential effects of raising Scoggins Dam on fish and habitats downstream.

### **C. Regional Programs and Issues**

The intent of this session was to provide an opportunity to discuss programs and issues, with a scope broader than an individual NWR, relevant to the working relationship between NWRs and the CRFPO. Although presentations for other Service programs were not specifically made, personnel representing Ecological Services participated in the discussions. The overall focus of the session concerned the nature of one of the most prevalent NWR aquatic resource needs, namely monitoring and evaluation for habitat management and restoration, and how to address needed funding and accomplishment reporting in a cross-program manner.

Although aquatic resource issues and needs vary among individual NWRs, one of the most prevalent needs identified at this and the previous workshops was monitoring and evaluation of aquatic habitats and associated populations. Planning, monitoring, and evaluation are especially important for habitat management and selecting and assessing restoration projects. Without adequate planning, monitoring, and evaluation, it is difficult to efficiently implement restoration activities and to provide transparent accountability relative to project implementation and the achievement of clearly identified habitat and population objectives. The primary emphasis of projects without adequate consideration of planning, monitoring, and evaluation tends to be implementation of the activity, not documenting and learning from the actual habitat and

population responses, which should be equally important as implementation. This emphasis may contribute to inefficient management in the long-term and reduce accountability. This is counter to the intent of resource management approaches recently encouraged by both the Service (i.e., Strategic Habitat Conservation—Final Report of the National Ecological Assessment Team, July 2006) and Department of the Interior (i.e., Adaptive Management—U.S. Department of Interior Technical Guide, 2007). In addition, monitoring and evaluation of aquatic resources can provide information for developing CCPs and habitat restoration projects at NWRs, as well as contributing to Ecological Services' activities off of NWRs (e.g., through the Coastal and Partners programs).

The design and implementation of monitoring and evaluation plans for fish and other aquatic resources are major activities and areas of expertise within the Fisheries Program. However, program funding for this component of habitat restoration projects is not emphasized as strongly as funding the planning and implementation (i.e., construction) components. Because NWRs and Ecological Services, as well as partners and other entities (e.g., Oregon Watershed Enhancement Board, Salmon Recovery Funding Board in Washington), may provide funds specifically for construction of habitat restoration projects, dedicating some level of Fisheries Program funds for the planning, monitoring, and evaluation components would assist in alleviating differential treatment among project components. Doing so would be an effective cross-program approach to habitat restoration and also contribute information critical to improving habitat management and restoration, overall. Because each Service program has requirements for reporting accomplishments, a truly cross-program approach involving Refuges, Fisheries, and Ecological Services in habitat restoration projects needs to accommodate sharing credit among programs.

A first step in developing a comprehensive cross-program approach is having a discussion at the Regional level that addresses:

- Priorities among the three programs, Refuges, Fisheries, and Ecological Services, relative to components of habitat restoration projects (e.g., planning, construction, monitoring and evaluation);
- Fisheries funding dedicated to the monitoring and evaluation component of habitat restoration projects; and
- The ability to share credit among Service programs in reporting habitat restoration accomplishments.

To encourage this first step, an action item from this workshop is to send a letter to the Regional Office requesting a meeting with the three Assistant Regional Directors to discuss the above topics.

### **III. Action Items**

The following are action items resulting from the 2007 NWR-CRFPO Workshop. The first eight items consist of multiple actions for each of the ongoing and planned projects, as well as other types of assistance for which the CRFPO has been working with NWRs during the past 20 months. The remaining four action items were generated through specific discussions of NWR needs and regional issues during the workshop.

1. Abundance and trend of chum salmon in Columbia gorge tributaries
  - Continue to evaluate spawning channel and other restoration opportunities.
  - Perform comprehensive assessment of all data collected to date.
  - Explore funding opportunities to continue monitoring chum salmon and other salmonids in Hardy Creek.
2. Assessment of salmonid populations and habitat on Tenasillahe and Welch islands
  - Complete second full year of pre-construction assessment in 2007 (i.e., directly measure fish passage at tidegate; investigate annual variability in physical habitat, water chemistry, and salmonid presence and distribution).
  - Conduct assessment of tidegate operation, fish passage, and fish and habitat surveys after new tidegates are installed during summer 2007.
3. Malheur NWR Donner und Blitzen River habitat restoration project
  - Evaluate whether analysis of invertebrate collections are appropriate to address project goal.
  - Conduct invertebrate analyses if appropriate.
  - Expand scope of qualitative analyses for fish and habitat data relative to similar types of habitat modifications and species-habitat relations in the literature.
4. Nestucca Bay NWR habitat restoration project
  - Incorporate reference sites and complete fish, invertebrate, and habitat surveys prior to construction of restoration project in summer 2007.
  - Conduct post-construction assessments of fish, invertebrates, and habitats in 2008.
  - Incorporate data collected by Siletz Tribe into evaluate of restoration project.
5. Hanford Reach National Monument: Instream flow and habitat assessments
  - Continue to evaluate Chinook salmon spawning habitat and potential effects of water management.
6. Assessment of habitat restoration at Bandon Marsh NWR
  - Collaborate with the Siletz Tribe to quantify physical habitat, describe fish use and diets, characterize invertebrate assemblages, and develop GIS model for Fahy Creek prior to construction.
7. Julia Butler Hansen National Wildlife Refuge: Assessment of fishes, habitats, and tidegates in sloughs on the mainland
  - Conduct first year pre-construction assessment of fish passage at tidegates, physical habitat, water chemistry, and salmonid presence and distribution in 2007.

8. CRFPO fisheries assistance for National Wildlife Refuges
  - Continue providing assistance for CCP development, technical support, and general surveys to address aquatic resource issues to the greatest extent possible with existing resources.
  - Complete invertebrate analyses to calculate benthic index of biologic integrity and incorporate into assessment report for Nelson Creek, adjacent to Julia Butler Hansen NWR.
  - Continue to work with NWRs to develop FONS and other proposals for sources to fund activities to meet aquatic resource issues and needs.
  
9. Christina Luzier is the CRFPO contact for freshwater mussels and is available to assist with issues concerning mussels at NWRs.
  
10. Sam Lohr will participate in the upcoming (late May) conference call with Malheur NWR, R1 Water Resources, ODFW, and Oregon WaterWatch concerning the NWRs water rights permit for the purpose of scoping how the CRFPO may be involved.
  
11. As soon as possible, Howard Schaller (lead) will work with representatives from Refuges (Fred Pavaglio) and Ecological Services (Kathy Hollar) to draft a memo to ARDs requesting a meeting to discuss priorities among the three programs, Fisheries funding for monitoring and evaluation of habitat restoration, and sharing credit among programs.
  
12. Unless otherwise advised, the CRFPO will organize a third workshop for April 2008 to promote effective information exchange and further develop a working relationship between programs.

## **IV. APPENDICES**

## APPENDIX A

Proposals entered in Fisheries Operating Needs Module for CRFPO directly involving NWRs as of March 2007.

<b>FONS</b>	<b>Title</b>	<b>NWR</b>
2005-034	Evaluate Impacts of Streamflow Regulation on Cultural and Riparian Resources of the Hanford Reach NM	Hanford Reach NM
2005-035	Evaluation of Fluctuating Flows on Stranding and Entrapment of Juvenile Fish in the Hanford Reach NM	Hanford Reach NM
2005-036	Development of a Spawning Habitat Suitability Model for Fall Chinook Salmon in the Hanford Reach NM	Hanford Reach NM
2005-037	Evaluate Migration Timing, Survival, and SAR's for Wild Hanford Reach Fall Chinook Using PIT Tags	Hanford Reach NM
2005-038	Evaluate Escapement, Spawning Habitat Use, & Carrying Capacity for Fall Chinook in Hanford Reach NM	Hanford Reach NM
2006-008	Fisheries assistance to National Wildlife Refuges for developing CCPs and other plans	multiple NWRs
2006-009	Watershed demonstration project with a National Wildlife Refuge	undetermined NWR
2006-010	Aquatic species surveys and habitat assessments at National Wildlife Refuges	multiple NWRs
2006-011	Technical assistance for aquatic resources at National Wildlife Refuges	multiple NWRs
2006-012	Fish access and slough habitats at Julia Butler Hansen NWR	Julia Butler Hansen NWR
2006-013	Chum Salmon Recovery in the Columbia River Gorge	Pierce NWR
2006-014	Survey and assessment for habitat restoration at Nestucca Bay NWR	Nestucca Bay NWR
2006-015	Survey and assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2006-016	Evaluation of carp control and redband trout at Malheur NWR	Malheur NWR
2006-017	Fish surveys and habitat assessment at Hart Mountain and Sheldon NWRs	Sheldon and Hart Mountain NWRs
2006-018	Fish passage barrier assessment on Service lands in Oregon and other select areas	multiple NWRs
2006-019	Fish and habitat monitoring at Lewis and Clark and Julia Butler Hansen National Wildlife Refuges	Lewis and Clark and Julila Butler Hansen NWRs
2006-054	National Fish Passage Project at Cocuzza culvert, Nestucca Bay National Wildlife Refuge	Nestucca Bay NWR
2006-056	Assessment and assistance for Gee Creek, Ridgefield National Wildlife Refuge	Ridgefield NWR
2006-060	Malheur National Wildlife Refuge, Instream Flow Study for Redband Trout	Malheur NWR
2006-065	How to evaluate tide gate operation for the purpose of estimating fish passage oportunities. NFHI	Julia Butler Hansen, Bandon Marsh, Nestucca Bay NWRs
2007-067	Fahy Creek aquatic habitat assessment and GIS model for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-068	Fahy Creek fish assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-069	Fahy Creek invertebrate assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR

<b>FONS</b>	<b>Title</b>	<b>NWR</b>
2007-071	Redd Creek aquatic habitat assessment and GIS model for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-072	Redd Creek fish assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-073	Redd Creek invertebrate assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-074	Overlook Creek aquatic habitat assessment and GIS model for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-075	Overlook Creek fish assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR
2007-076	Overlook Creek invertebrate assessment for habitat restoration at Bandon Marsh NWR	Bandon Marsh NWR



## APPENDIX B

### NWR-FISHERIES WORKSHOP AGENDA

April 25, 2007

Columbia River Fisheries Program Office

1211 SE Cardinal Court, Suite 100

Vancouver, WA 98683

Goal: Provide a forum to promote effective information exchange and facilitate a working relationship between National Wildlife Refuges and the Columbia River Fisheries Program Office.

#### Objectives:

1. Update NWRs about results and activities by the CRFPO to address aquatic resource issues and needs during the past 20 months.
2. Update CRFPO about aquatic resource issues and needs of NWRs discussed previously and present new ones.
3. Explore additional possibilities for cooperative efforts between NWRs and CRFPO.
4. Develop 2007 workshop document with action items.
5. Schedule 2008 Workshop.

Geographic Scope: Columbia River basin below McNary Dam, Oregon waters excluding the Klamath River basin, small tributaries of Willapa NWR

1. 8:30-8:40 Welcome and overview of workshop (Lohr)

2. CRFPO results and activities during past 20 months

#### Ongoing projects

8:40-9:00 Pierce NWR: Chum salmon project (Johnson)

9:00-9:20 Julia Butler Hansen-Lewis and Clark NWRs: Fish use, habitats, and tidegates at sloughs on Columbia River islands (Johnson)

9:20-9:40 Malheur NWR: Blitzen River fish and habitat surveys (Hudson)

9:40-10:00 Nestucca Bay NWR: Fish and habitat surveys (Hudson)

10:00-10:20 Hanford Reach NM: Instream flow studies (Skalicky)

10:20-10:40 Break

#### Project planning

10:40-11:00 Bandon Marsh NWR: Assessment of tidal marsh restoration.  
(Hudson/Skalicky/Lohr)

11:00-11:20 Julia Butler Hansen NWR: Fish use, habitats, and tidegates at sloughs on the mainland unit (Johnson)

Other NWR assistance

- 11:20-11:40 General surveys, technical assistance, and CCP participation (Lohr)
- 11:40-12:00 Questions and discussion on morning presentations
- 12:00-1:00 Lunch
3. NWR updates and new issues and needs
- 1:00-3:00 Open discussion of new NWR issues and needs, updates on previous issues and needs, CCP schedules and progress, upcoming work
- 3:00-3:20 Break
4. Regional programs and issues
- 3:20-4:20 To be determined
- 4:20-4:30 Wrap-up

## APPENDIX C

### Workshop Attendees

Tim Bodeen	RO Refuges
Terri Butler-Bates	Willapa NWR
Jim Clapp	Columbia River Gorge NWRs
Al Clark	Julia Butler Hansen NWR
Lynn Cornelius	WSU Extension at Ridgefield NWR
Dar Crammond	RO Water Resources
Tim Cummings	CRFPO
Joe Engler	Ridgefield NWR
Marie Fernandez	Willapa NWR
Jerry Finley	CRFPO
Kathy Hollar	RO Ecological Services
Amy Horstman	OFWO
Mike Hudson	CRFPO
Jeff Johnson	CRFPO
Rich Johnson	RO Fisheries
Chad Karges	Malheur NWR
Sam Lohr	CRFPO
Roy Lowe	Oregon Coast NWR Complex
Fred Pavaglio	RO Refuges
Tim Roth	CRFPO
Rick Roy	Malheur NWR
Howard Schaller	CRFPO
Pete Schmidt	Tualatin NWR
Joe Skalicky	CRFPO
Linda Watters	RO Refuges
Ralph Webber	Tualatin NWR
Tim Whitesel	CRFPO

## APPENDIX D

### NWR-FISHERIES WORKSHOP NOTES

April 25, 2007

Columbia River Fisheries Program Office

1211 SE Cardinal Court, Suite 100

Vancouver, WA 98683

Goal: Provide a forum to promote effective information exchange and facilitate a working relationship between National Wildlife Refuges and the Columbia River Fisheries Program Office.

#### Objectives:

1. Update NWRs about results and activities by the CRFPO to address aquatic resource issues and needs during the past 20 months.
2. Update CRFPO about aquatic resource issues and needs of NWRs discussed previously and present new ones.
3. Explore additional possibilities for cooperative efforts between NWRs and CRFPO.
4. Develop 2007 workshop document with action items.
5. Schedule 2008 Workshop.

Geographic Scope: Columbia River basin below McNary Dam, Oregon waters excluding the Klamath River basin, small tributaries of Willapa NWR

1. Welcome and overview of workshop (Lohr)

Sam welcomed everyone and noted background from the initial workshop and objectives of the current workshop. Everybody introduced themselves.

2. CRFPO results and activities during past 20 months  
Ongoing projects

Pierce NWR: Chum salmon project (Johnson)

Jeff presented updates on the chum salmon work that has been ongoing at Pierce NWR since 1997 and Hamilton Springs since 1999 (see attached presentation). This looks like the last year that the project will receive funding from BPA, which began in 1999. The goals of the project is to examine factors limiting chum salmon, relations between fish spawning in the tributaries and Columbia River, and opportunities to enhance production in tributaries. Tim B. asked how much funding it would take to keep the work going. Jeff said that BPA has provided about \$200K annually, and that work at Pierce can probably be done for less. Amy asked about evaluations of rearing/spawning channels. Howard noted that there is a big difference between channels constructed for spawning and those for juvenile fish rearing. He gave some background about the spawning

channel at Pierce NWR: It ideally would have been located over spring, but had to be built at a different location; Water diverted from Hardy Creek is the source at this location; It can only be operated during high water years; and Assessments of using well water and associated infrastructure indicated that the cost would be extremely high.

Julia Butler Hansen-Lewis and Clark NWRs: Fish use, habitats, and tidegates at sloughs on Columbia River islands (Johnson)

Jeff described the project (see attached presentation), which is comparing fish use and habitats in sloughs between two islands, one surrounded by dikes and has tidegates (Tenasillahe Island at Julia Butler Hansen NWR) and the other without dikes and tidegates (Welch Island at Lewis and Clark NWR). The Army Corps of Engineers will be replacing the tidegates this year with new ones designed to increase water exchange and fish passage between the Columbia River and sloughs on Tenasillahe Island as part of the Columbia River Channel Improvement Project. The Corps funded pilot work in 2005 and a full complement of work in 2006. Preconstruction evaluation of fish, habitats, and tidegate operation is continuing this year with partial funding from the Corps, refuges' challenge cost-share funds, and R1 Fisheries. There was a question about the need for tidegates on Tenasillahe Island. The tidegates prevent habitat for Columbian white-tailed deer from flooding.

Malheur NWR: Blitzen River fish and habitat surveys (Hudson)

Mike described the project (see attached presentation), which is evaluating biological responses to stream habitat structures. Malheur NWR installed rock weirs and root wads in the Donner und Blitzen River in 2002, primarily to increase habitat complexity. The NWR funded the CRFPO to conduct the evaluation. The CRFPO surveyed sites in 2001 before construction occurred, and repeated them after construction in 2003 and 2005. The structures have increased habitat diversity through the study reach and fish species diversity is greater at sites with structures compared to those without structures. Fish sampling efficiency, especially with respect to redband trout, was discussed. Alternate sampling approaches may have been more appropriate for habitats in the river.

Nestucca Bay NWR: Fish and habitat surveys (Hudson)

Mike noted that pilot work for the project has been done and that it is set to go in earnest next month (see attached presentation). The goal of the project is to evaluate physical and biological responses to restoration of tidal marsh habitats at Nestucca Bay NWR, which was an immediate need identified during the initial NWR-CRFPO workshop in 2005. The CRFPO has received limited funding for the assessment from the National Fish and Wildlife Foundation, with a focus on the post-construction period. Construction is scheduled for summer 2007. There was a discussion about how funding for construction appears to be readily available, but it is difficult to get funds to monitor and assess these types of projects. Rick noted that monitoring needs to always be part of any project. Tim W. noted that we need to have a unified approach for securing and allowing monitoring needs to be met.

## Hanford Reach NM: Instream flow studies (Skalicky)

Joe S. provided updates on the instream flow and habitat assessments that the water management and evaluation team has been conducting at the Hanford Reach NM during the last few years (see attached presentation). This project has had various sources of funding (e.g., States of Alaska, Washington) and is providing support for the Service in FERC relicensing proceedings. Joe described several of the advanced technologies (e.g., GPS, hydrodynamic modeling) they are using to develop quantitative assessment tools to evaluate the effects of hydro-operations and proposed operations on aquatic habitats and fish. He highlighted that the approaches and tools used for the project can be applied to various species (e.g., fish, birds, plants) and other potential types of potential assessments like dike or dam removal, habitat restoration, and exotic species. Mike asked about data generated from LIDAR versus channel cross sections. Joe said that it depends on the desired level of resolution. They have used both, LIDAR and traditional survey methods for longitudinal cross sections, which the cross sections provide data on substrate to account for resistance in hydrodynamic modeling. Modeling with River2d or PHABSIM can help guide habitat restoration work.

### Project planning

Bandon Marsh NWR: Assessment of tidal marsh restoration. (Hudson/Skalicky/Lohr)

Sam gave the presentation for proposed work that both Mike and Joe S. are involved to assess the habitat restoration project at Bandon Marsh NWR (see attached presentation). The project is scheduled for construction in 2009, and involves multiple partners in restoring 430 acres of tidal marsh habitat through dike removal and affects three streams. The assessment was identified as an immediate need at the initial NWR-CRFPO workshop in 2005. The presentation described a conceptual approach for evaluating physical and biological attributes of restoration, noted how the project is consistent with various aspects of the Service's strategic vision and direction, and provides sources highlighting the importance of monitoring and evaluation for habitat restoration. Roy noted that six universities, two tribes, ES, and other partners are involved, and that Federal Highways will be providing about \$4M. The area also contains several archaeological sites. The area is grazed, and Tim W. asked about how grazing is used at NWRs and potential effects on aquatic habitats. How each NWR has varying guidelines for using cattle to manage vegetation in and replace mowing in some cases was discussed. A proposal for the CRFPO and Siletz Tribe to collaborate on a pre-construction assessment in the Fahy Creek portion of the NWR recently received CPR funds from refuges.

Julia Butler Hansen NWR: Fish use, habitats, and tidegates at sloughs on the mainland unit (Johnson)

Jeff presented work recently started on the mainland unit of Julia Butler Hansen NWR (see attached presentation). Under Section 536 of the Water Resources Development

Act, the Corps is conducting a feasibility study to replace existing tidegates and install new tidegates on sloughs completely blocked by dikes to improve water exchange with the Columbia River and fish passage. They are funding the CRFPO to assess fish, habitat, and tidegate operation prior to any construction. In addition to modifying tidegates, options being considered include restoration of riparian vegetation and potential improvements to deer habitat by reducing the duration of winter flooding. Study and reference sample reaches are presently being surveyed in sloughs for the pre-construction assessment.

#### Other NWR assistance

General surveys, technical assistance, and CCP participation (Lohr)

Sam noted categories of immediate needs identified at the initial workshop and reviewed some examples of how the CRFPO is addressing them, primarily with existing resources (see attached presentation). The categories are CCP support, general technical assistance, and general survey and assessment. The CRFPO is currently participating on extended planning teams and is aware of other NWRs that have or will begin their planning processes soon. General technical assistance mainly includes identifying information needs, study design, and document review. An example is providing assistance concerning background information and watershed approaches to Lynn, the Gee Creek watershed coordinator based at Ridgefield NWR, which now has a qualitative survey part. General survey assistance primarily includes short duration sampling activities for specific NWRs. Preliminary results from Nelson Creek, adjacent to Julia Butler Hansen, were an example of fish survey and habitat assessment work that funding was provided from the NWR and CRFPO. Sam also reviewed the watershed demonstration project discussion from the first workshop and requested any updated information. Al noted that there has been little work done on mussels in the lower Columbia River and sloughs, and that mussels would be an issue in need of assistance.

#### 3. NWR updates and new issues and needs

Open discussion of new NWR issues and needs, updates on previous issues and needs, CCP schedules and progress, upcoming work

Malheur NWR—Dar, Chad, and Rick discussed background about the water rights application issue at Malheur NWR. The NWR applied to divert water during winter from the Blitzen River for wetland management, which was contested by WaterWatch and ODFW. The Service, ODFW, and WaterWatch have signed a settlement agreement for a permit that includes four elements that must be met before a certificate can be issued for the water right. The elements are: Water quantity and measurement; Water quality monitoring plan; Sufficient fish passage and screens at five major dams; and Redband trout study to determine flows needed to maintain and restore habitat. All levels of the flow study is to be done collaboratively with ODFW. Dar said that the RO water rights office does not have the expertise to design and implement the redband trout flow study and would like to have a fisheries person from the CRFPO with oversight, field, and analytic abilities to assist with it and all main questions dealing with fish. Howard noted that the first step needed is to define goals and objectives for what is to be achieved by

maintain and restore redband trout and their habitat. An approach is a model using the idea of capacity. Rick noted that approaches have to deal with birds, Clean Water Act (e.g., temperature, DO, whose limits are exceeded a lot), and carp. Matt Anderson is an OSU grad student doing redband life history work in the Blitzen; need to contact Tim Walters with ODFW for information about the study. Dar noted that the grad study can contribute to the needs of the settlement, but a specific scope needs to be developed. Howard said that an estimate of spawning potential is needed, and committed to have somebody from the office sit in on the next conference call with the Service and ODFW in late May to scope it out so that we can determine how the office can be involved.

For other needs, Rick feels that carp are an engineering issue and their effects on wetlands and birds are known. Keeping them below 200 lbs/acre in wetlands would be good.

Willapa NWR—Marie asked about help in determining whether cutthroat trout the NWR planted in Long Island and Headquarters creeks are still there, and also about contacting Christina Luzier concerning mussel issues. They will be conducting mussel surveys and are considering the Bear and Neselle rivers as donors to introduce mussels in some streams at the refuge. Howard said that it would be fine to contact Christina. Lynn said that the Columbia Land Trust might have some information because he knew about a project where they moved a mussel bed. Willapa will be beginning their CCP this summer, and there are streams on some recently acquired property that have not been surveyed. It would be good to have habitat survey training for NWRs.

Ridgefield NWR—Lynn asked for continued involvement by the CRFPO in Gee Creek, developing a watershed assessment, and looking at stream reaches on the NWR. Joe E. would like information concerning fish species and habitats in Campbell Slough and Post Office Lake, as well as the possibility of tidegates at Campbell Slough, too.

Oregon Coast NWRs—Roy said that they have the same needs with CCPs and other issues as during the first workshop. They would like to evaluate existing tidegates to have better data.

Julia Butler Hanson NWR—Al would like to keep the existing projects going on the NWR. Mussels could be integrated into the larger projects. He would like to see a more in depth look taken for the potential to restore Risk Creek because it is the only stream that is on the NWR.

Tualatin NWR—Ralph said that the same needs still apply as were discussed at the first workshop (e.g., looking at the importance of fish rearing habitat in the mainstem Tualatin River, especially during summer when temperature is probably lethal). They are partnering with Metro and may have funds start restoring the historic lake bed at Wapato Lake. They first need to retrofit the water delivery system and have screens. Uncertain about where raising Scoggins Dam stands. The water user group is exploring purchasing the facility from BOR. ODFW and ES is mostly involved in potential habitat loss upstream, so we need to keep track of other fish issues downstream.



#### 4. Regional programs and issues

There were no specific regional programs or issues to add to the agenda. Sam asked everybody about their thoughts on how best to proceed in pursuing funds for addressing NWR aquatic resource needs. Most of the needs deal with M&E, which does not receive as much emphasis for funding as other activities. Howard suggested that refuges and fisheries should meet and discuss priorities at the regional level. This was starting to happen with the fisheries project leaders meeting. Roy noted that this should be presented to the RD. Kathy suggested that it would be best to approach this from a cross program perspective. Howard noted that there should be a larger conversation on funding M&E. Other sources like the coastal program and Fish Habitat Initiative have funds for the dirt moving aspects of habitat restoration projects, if fisheries can provide funds for M&E, then all programs can share in the credit. Ralph thought that the time is right to elevate this because focal areas have been identified. Roy is attending the ES-Fisheries meeting next month in Reno, and thought this might be an opportunity to bring this up. Howard thought the focus should be R1, and how fisheries can provide funds for aquatic M&E work to assist Refuges and ES. Tim R. noted that there needs to be a way for everybody to share in the credit for all aspects of a project. Linda that we should let ARDs know of what was discussed today and that it is difficult to act across programs without regional guidance. Fred said that the CPR program has not sat down together with a larger group; it needs to hear this from the ground up. All the programs should get together to compare priorities. Ralph noted that a key is to determine how to report accomplishments; Kathy suggested that they need to be reported as a whole. Howard said that approach would help enable fisheries to put funding into M&E. Amy noted that would be a natural fit with OWEB; they may have \$50M to put toward projects and would likely welcome the opportunity to provide a match to funds used for M&E.

Action Item: The group agreed that the workshop notes and a letter requesting a meeting at the regional level to discuss program priorities among Refuges, ES, and Fisheries relative to habitat projects, Fisheries funding for M&E, and sharing credit among programs should be send to the ARDs.

## **APPENDIX E**

(Graphics for the following presentations are contained in the file: NWR-CRFPO 2007 Appendix E.pdf:

- Abundance and trend of chum salmon in Columbia gorge tributaries,
- Assessment of salmonid populations and habitat on Tenasillahe and Welch islands,
- Malheur NWR Donner und Blitzen River habitat restoration project,
- Nestucca Bay NWR habitat restoration project,
- Hanford Reach National Monument: Instream flow and habitat assessments,
- Assessment of habitat restoration at Bandon Marsh NWR,
- Julia Butler Hansen National Wildlife Refuge: Assessment of fishes, habitats, and tidedegates in sloughs on the mainland,
- CRFPO fisheries assistance for National Wildlife Refuges)

## APPENDIX F

Immediate needs identified by NWRs in 2005 (after NWR-CRFPO 2005 Workshop Report).

### **1. Willapa NWR**

- Review report on survey of fish barriers and determine how to address sites found to be problems.
- Assess conditions (species and habitat) in streams in which restoration actions have been implemented.

### **2. Julia Butler Hansen NWR**

- Assess habitat conditions and species composition in sloughs to evaluate strategies for modifying existing tidegates and opportunities to create sites for fish passage.
- Support Columbia River Land Trust in acquiring land adjacent to NWR.

### **3. Lewis and Clark NWR**

- Support for establishing regional reference sites for monitoring species composition and habitats in sloughs not directly affected by dikes and tidegates.
- Assess potential effects of dredge spoils and bird predation on juvenile salmonids and their habitat.

### **4. Ridgefield NWR**

- Conduct species surveys and habitat assessments in areas open to the Columbia River (Gee Creek, Campbell Lake and Slough, Post Office Lake).
- Assess fish passage at the mouth of Gee Creek.

### **5. Steigerwald NWR**

- CRFPO participation in floodplain restoration planning.
- Technical assistance and review in writing fish management plan.

### **6. Franz Lake NWR**

- Technical assistance and review in writing fish management plan.

### **7. Pierce NWR**

- Continue monitoring chum salmon and assess habitat restoration opportunities.
- Technical assistance and review in writing fish management plan.

### **8. Umatilla NWR**

- Conduct species surveys and habitat assessments in all backwater areas, especially at the mouth of McCormack Slough if any action to open slough is taken.
- Assess potential effects of predation by terns on juvenile salmonids at the Blalock Complex and Long Lock Island. (Riparian habitat work currently being conducted may attract birds.)

**9. *Bandon Marsh NWR***

- Conduct comprehensive pre-construction monitoring (species composition and distribution, habitat assessment) for 430-acre restoration project planned for 2007.
- Baseline information for aquatic species occurrence and habitat assessment throughout NWR.

**10. *Siletz Bay NWR***

- Provide technical assistance for data analysis and reporting for previous restoration projects (e.g., Millport Slough--100 acres restored in 2003).
- Baseline information for aquatic species occurrence and habitat assessment throughout NWR.

**11. *Nestucca Bay NWR***

- Conduct pre-construction monitoring (species composition and distribution, habitat assessment) for 88-acre restoration project planned for 2006.
- Baseline information for aquatic species occurrence and habitat assessment throughout NWR.

**12. *Tualatin NWR***

- Technical assistance in analyzing effects of raising Scoggins Dam.
- Information on salmonid presence, life stages, life histories, age structure, and use of NWR waters.
- Water temperature information for wetland management.
- Monitoring program to assess functioning of water control structures relative to juvenile salmonid movement.
- Fish passage information for culverts.
- Testing of shallow wells for water supply.

**13. *Willamette Valley NWRs***

- Information on Oregon chub population genetics.
- Technical assistance for water quality monitoring.

**14. *Malheur NWR***

- Technical assistance in designing and implementing a study to develop approaches to control carp in the basin that benefits redband trout and other native species.
- Funding for fish screens, and continued screening of carp in Blitzen Valley and Double O.
- Carp control in Malheur Lake when it dries (i.e., remove carp and screen off Silvies River drainage).
- Restore Blitzen River habitat.
- Obtain spring water rights in Double O.
- Conduct biological inventory and review existing data in preparation for working on the CCP.

- Technical information regarding Krumbo Reservoir stocking rainbow trout by the state and its effects on redband trout.

**15. *Sheldon/Hart Mountain NWR***

- Information on present status of species and habitats.
- Assessment of introduced species.
- Assessment of effects of horses and management programs on fish.