

NWR-CRFPO Workshop 2008

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

May 1, 2008

Vancouver, Washington

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

2009

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Executive Summary

On May 1, 2008, 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 12 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 2008 workshop document with action items.
5. Schedule 2009 Workshop.

The purpose of the workshop was to build upon efforts initiated during earlier workshops. The 2008 workshop was organized according to five main sessions: 1) CRFPO results and activities during the past 12 months; 2) NWR Aquatic resource activities and issues; 3) Activities on 2007 workshop action items; 4) NWR updates and new issues and needs; and 5) Regional programs and issues affecting NWR CRFPO efforts. The intent of the first session was to provide current updates and results of projects. Personnel from the CRFPO made presentations concerning activities at NWRs focused on results and planned activities for ongoing projects. The intent of the second session was to present activities and issues concerning aquatic resources at NWRs that are being addressed by NWRs biologists and R1 Division of Water Resources. The third session provided a review of action items developed during the previous workshop, and reported on activities to address them. The fourth session provided an opportunity for NWRs to update the status of aquatic resource issues and needs identified earlier and discuss new needs that may have arisen. Personnel representing three NWRs or complexes discussed various aquatic resource issues and associated needs. The intent of the fifth 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 focused entirely on strategic habitat conservation (SHC), including previous efforts and planned activities for its application in R1.

This report summarizes the 2008 NWR-CRFPO workshop in four sections: 1) Background, which provides context relative to the initial workshop and subsequent workshops; 2) 2008 NWR-CRFPO Workshop, which reports on each of the five workshop sessions; 3) Action Items, which include activities for ongoing and planned projects, and topics 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 NWRs¹ and representatives of programs from the regional office in July 2005. The goal of this initial 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 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. The CRFPO has also been working with NWRs to provide technical assistance on various issues to the extent possible, assisting in the development of Comprehensive Conservation Plans (CCPs), and jointly pursuing various internal and external sources of funding to address aquatic resource needs. 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. This report summarizes topics and discussions from the 2008 workshop, and includes supporting materials. It is the second workshop held since 2005. This and all previous reports are available at the CRFPO webpage (<http://www.fws.gov/columbiariver/programs/RAP/refuge.html>).

¹ 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).

II. NWR-CRFPO Workshop 2008

The intent of the 2008 workshop was to build upon efforts initiated during previous workshops 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 12 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 2008 workshop document with action items; and
5. Schedule 2008 Workshop.

The workshop was organized according to five main sessions to accomplish the objectives (see agenda—Appendix A): 1) CRFPO results and activities during the past 12 months; 2) NWR aquatic resource activities and issues; 3) Activities on 2007 workshop action items; 4) NWR updates and new issues and needs; and 5) Regional programs and issues. This portion of the workshop report summarizes each of the three sessions. The attendance list (Appendix B), workshop notes (Appendix C) compiled by Ruby Bourne and Sam Lohr (CRFPO), and presentations (Appendix D) are also included.

A. CRFPO Results and Activities During Past 12 Months

The intent of this session was to provide current updates and results of projects. Personnel from the CRFPO made presentations concerning activities at NWRs since the 2007 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. Julia Butler Hansen-Lewis and Clark NWRs: Part I--Fish use, habitats, and tide gates at sloughs on Columbia River islands; Part II--Fish use, habitats, and tide gates at sloughs on the mainland unit

Tenasillahe and Welch islands are portions of Julia Butler Hansen (JBH) and Lewis and Clark (LC) NWRs adjacent to the JBH mainland unit. As part of the Lower Columbia River Channel Improvement Project, the U.S. Army Corps of Engineers (Corps) modified a tide gate at Tenasillahe Island to benefit juvenile anadromous salmonids by providing access to sloughs behind the island's dikes. In addition, the Corps initiated feasibility studies for modifying existing tide gates and installing new ones on sloughs isolated from the Columbia River by dikes at the mainland unit. The CRFPO is assessing tide gate operation and describing aquatic habitat and fish presence and distribution in sloughs to establish baseline conditions and evaluate projects at the islands, mainland, and reference sloughs.

At the mainland, surveys were conducted in upper Risk and Nelson creeks for adult salmonids and evidence of spawning. Adult coho salmon were present in Nelson Creek in 2006 and 2007, and a chum salmon carcass observed in 2006. No adult fish were observed in Risk Creek. For juvenile salmonids (Chinook and coho salmon) in 2007, estimated rates of passage were

typically 2-3 times higher in two reference sloughs compared to three sloughs with tide gates. Overall fish assemblages differed among sloughs, with no introduced fish species detected at reference sloughs; whereas introduced species were detected at four of eight sloughs with and without tidegates. A second year of pre-construction evaluation is being conducted in 2008, with post-construction evaluation anticipated.

At the islands, habitats differed with consistently lower dissolved oxygen, higher turbidity, earlier warming of water temperatures, and prevalence of aquatic vegetation in Tenasillahe Island sloughs compared to reference sloughs without tide gates at Welch Island. Introduced species composed a higher portion of fish assemblages at Tenasillahe Island sloughs than at Welch Island. Although the tide gates at Tenasillahe Island provide limited opportunity for fish passage (2006-mean of 1.1 opening/day for 3.8 hours) over 100 juvenile Chinook salmon were collected exiting the slough. Residence time of marked, hatchery Chinook salmon released at Welch Island was up to 10 days (most exited within 1-2 days), whereas PIT tagged fish released at Tenasillahe Island were detected exiting for 1-73 days (mean 26 days in 2006, mean 39 days in 2007). The Tenasillahe Island tide gate was modified in summer 2007. Post-construction assessment begin in 2008 and is anticipated to continue through 2009

2. Nestucca Bay NWR: Fish and habitat surveys

Nestucca Bay NWR restored about 80 acres of tidal wetland habitats by removing a dike and tidegate adjacent to the Little Nestucca River 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 also contribute to characterizing the pre-construction period. Reconnaissance fish surveys were conducted in late 2006 and early 2007, and systematic sets using hoop nets as the primary collection method was applied to most of the 16 sample sites in the study area and two reference sample sites near the restoration project. Fish sampling is planned to continue through the spring and into the summer. Invertebrate drift samples were collected and preserved for later analysis. Existing GIS data have been used to develop a hypothetical hydrologic model for pre-conditions, and needs to be replicated for post-construction conditions. Initial results indicate that the project may be benefiting coho salmon and perhaps steelhead.

3. Bandon Marsh NWR: Assessment of tidal marsh restoration

Bandon Marsh NWR is planning to restore over 400 acres of tidal wetland habitats by removing dikes, tidegates, and potentially filling up to 15 miles of ditches at the Ni-les'tun Unit adjacent to the Coquille River. Construction for the restoration project is planned for 2009 or 2010. Cross Program Results (CPR) funds from Refuges have allowed the CRFPO to evaluate physical and biological responses to the habitat restoration project similar to the approach used at Nestucca Bay NWR. Efforts have been focused on one of three tributaries that cross the unit, Fahey Creek. To date, three fish surveys have been conducted (November 2008, January and April 2008), which collected seven native (coastal cutthroat trout, steelhead, coho salmon, Chinook salmon, sculpin, threespine stickleback, and shiner perch) and three non-native (mosquitofish, brown bull head, and smallmouth bass) fish taxa. Invertebrate drift samples were also collected in 2007 and 2008, and preserved for later analysis.

4. Hanford Reach NM: Instream habitat studies

The CRFPO has been conducting 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. One aspect of these assessments was to estimate the effects of hydropower operations on stranding and entrapment mortality of juvenile Chinook salmon in the reach during 2007. Because hydropower operations can cause water surface elevations to fluctuate by up to 12 feet along the 50-mile reach, juvenile mortality caused by stranding or entrapment in dewatered depressions, with associated susceptibility to predation and thermal stress, is an important consideration for dam operations. Temporally and spatially stratified estimations of mean number of fish per entrapment, entrapment histories, and lethality rates were used to generate a reach-wide mortality estimate for entrapments based on operations and conditions in 2007. Almost 220,000 entrapment events were estimated to have occurred throughout the Hanford Reach in 2007, affecting 596,600 juvenile Chinook salmon. With a 90% mortality rate, a mean of 545,200 of these individuals were estimated to have died as a result. This estimate represents about 6% of the total population of juveniles. Physical survey and modeling tools contributing to 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 aquatic nuisance species management.

B. NWR Aquatic Resource Activities and Issues

The intent of this session was to provide current updates and results of select activities at NWRs affecting aquatic resources. Personnel from the NWRs and the Regional Water Resources Office made presentations concerning activities at NWRs. The following are brief summaries of each presentation.

1. Transfer of a western pearlshell mussel population to Willapa NWR

Willapa NWR has transferred western pearlshell mussels from the Bear River to three streams at the NWR that presently do not contain mussels but possess suitable habitat and host fish. Surveys of mussels in both the Bear and Neselle rivers were coordinated with the Pacific Northwest Native Freshwater Mussel Workgroup, and indicated that the Bear River contained the more appropriate donor population from which 100 individuals were collected in September 2007. Each individual received a uniquely-coded tag, and their dimensions and weight recorded. Mussels were then transferred to sites within each of the three streams (10 individuals transferred to Chum Creek, 35 to Headquarters Creek, and 55 to North Creek). Since October 2007, one to three surveys have been conducted monthly in each stream to enumerate mussels, note orientation and movement, and record length and weight of individuals. Surveys are continuing to determine mussel survival, growth, reproduction, and potential recruitment of juveniles.

2. Water management at Tualatin NWR

Water management at Tualatin NWR includes providing seasonally flooded wetlands that supply habitat for a variety of species and encourage growth of native plant species. Three aspects of water management are of particular interest relative to fish and aquatic habitats, passage issues, operational issues, and current and future concerns. Passage issues primarily concern allowing fish that enter wetlands during floods safe access to return to the river. Some wetlands have water control structures with notched overflow gates to allow water to drain and allow juvenile

anadromous fish to pass. These were constructed during 2003-2005, and structures constructed earlier may have notches added because they were built prior to listing anadromous fish in the Willamette River valley. Operational issues primarily concern release of water from wetlands to encourage fish to enter the river prior to April 30th when wetlands are drawn down due to potential thermal effects on the river. The NWR is conducting some temperature monitoring because this permit requirement affects waterfowl and encourages growth of reed canary grass. Another operational issue is the use of lift pumps in the river that require fish screens versus relatively inexpensive shallow wells that do not need screens to supply water. Current and future concerns include the Rock Creek culvert, which is considered a fish barrier, the Chicken Creek diversion structure, whose design capacity to convey water has been exceeded because development in the drainage has increased peak flows, and plans to raise the height of Scoggins Dam, which may further isolate the Tualatin River floodplain due to reductions in peak flows.

3. Water studies at Malheur NWR and other water related topics

The Water Resources Branch is assisting Malheur NWR on a water rights application to divert water from the Donner und Blitzen River primarily for wetland habitat management during October to March. The original application was contested by Water Watch Oregon, Harney County, and Oregon Department of Fish and Wildlife. A settlement agreement was reached requiring an instream flow study consisting of four elements that must be met before a certificate for the water right can be issued. The four elements consist of: A water measurement plan, A water quality plan, Fish passage and screening, and Redband trout flow study. The water measurement plan has been accepted and water quality plan is in process with Oregon Department of Environmental Quality. For fish passage and screening, Malheur NWR will provide passage and screens at all diversions and dams according to ODFW requirements, which is estimated to cost \$8M and take several years. The instream flow study (1D PHABSIM) was designed by ODFW, and is underway with ODFW, Water Resources Branch, and USGS working on it. Issues that have arisen with the study are: Turnover in ODFW lead personnel; Possible changes in river transects between surveys due to high flows; and Lack of information concerning habitats for various life stages of redband trout.

The Water Resources Branch is also involved in a nation-wide request (2008 Water Data Call) to assess what would be necessary to secure water supplies for all Service facilities (NWRs, National Fish Hatcheries) in regions 1 and 8. Cost estimates for providing water needs at facilities in the two regions are almost \$500M. Water Resources made recommendations to prepare water resources assessments, prioritize water needs, and create a consistent regional approach. In the short term, the Water Resources Branch is planning to prepare about five assessments this year (Sheldon NWR, Kootenai NWR, Hagerman NFH, Oaho NWR Complex, and Willamette Valley NWR Complex), and develop a database for water resources data and analyses.

C. Activities on 2007 Workshop Action Items—Status of action items and related topics

The 2007 NWR-CRFPO Workshop generated 12 specific action items addressing a range of topics (e.g., planned activities for ongoing projects, technical assistance, and requesting a meeting with ARDs). Presentations made by the CRFPO earlier were examples of actions for ongoing projects. Examples of technical assistance include fish surveys conducted in Gee Creek at Ridgefield NWR, securing permits and assisting with sampling in flooded wetlands at Tualatin

NWR, and assisting with CCPs for a number of NWRs. In November 2007, a meeting was held with the ARDs for NWRs, Fisheries, and Ecological Services to discuss program priorities relative to habitat management and restoration projects; dedication of fisheries resources for planning, project selection, and monitoring and evaluation; and ability to share credit among programs in reporting habitat accomplishments. A presentation was made stressing several issues in the context of strategic habitat conservation (SHC) and the Service's strategic vision and direction—namely that: The monitoring and evaluation component of habitat projects are not emphasized to the extent as the construction component; These components are essential for transparent accountability in all aspects of project development, selection, and assessment relative to objectives; Dedicating resources to these components would improve efficiency and accountability; and Sharing credit would improve cross-program efforts. The discussion noted how these issues can be addressed through SHC and that sharing credit among programs was an expected outcome of working together. A follow-up memo was sent highlighting courses of action, but a response has not been received.

In January, SHC focal area teams, consisting of representatives from most Service programs, were convened to identify focal species and assess their current status and needs relative to applying the SHC framework. Reports summarizing this assignment were submitted to the regional office in March. The CRFPO participated on four teams, Lower Columbia River, Washington-Oregon Coast, Willamette Valley, and High Desert, along with NWRs.

D. 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 previous workshops and identify new needs that may have arisen. Personnel from each NWR discussed their issues and needs, which are summarized below.

1. Willapa NWR Complex

Issues

At Willapa NWR, the restoration of about 800 acres of salt marsh habitat in the southern portion of the NWR that is presently maintained as freshwater habitat by dikes is being considered. Restoration alternatives and their effects need to be assessed. Information about fish hosts for mussels at the NWR would be helpful. A consultant is working on western brook lamprey and possible reintroductions. It is unknown whether the coastal cutthroat trout planted in NWR streams have survived. There may be opportunities for habitat restoration actions in Risk and Nelson creeks at Julia Butler Hansen NWR.

Needs

- Assistance with evaluating potential alternatives for restoring salt water marsh habitat in south Willapa Bay.
- Information concerning possible fish hosts for juvenile freshwater mussels in streams.
- Assistance in determining whether cutthroat trout planted in Long Island and Headquarters creeks are still in the streams.
- Training for conducting aquatic habitat surveys.
- Assistance on habitat restoration planning for Risk and Nelson creeks.

2. Ridgefield NWR

Issues

Fish sampling of lower Gee Creek in the 1990s collected juvenile lamprey and coastal cutthroat trout. Population and habitat information for the species in the stream would be useful. There are mussel shells near the mouth, and it is uncertain whether conditions at the mouth form a barrier to fish passage at times. A potential break in the dike at Post Office Lake might entrap fish.

Needs

- Assistance with developing a watershed assessment for Gee Creek using the OWEB approach as a model.
- Information on fish and habitats in Post Office Lake, as well as Campbell Slough and Gee Creek.
- Assessment of access to Gee Creek.

3. Oregon Coast NWRs

Issues

Work on CCPs for the three estuarine NWRs (Bandon Marsh, Nestucca Bay, and Siletz Bay) should begin next year. Much of the information was collected by ODFW in the 1970s, so there is a need for more recent information. Siletz Bay NWR recently acquired additional land isolated next to the highway. Information on tidegates and culverts at the NWRs would be helpful.

Needs

- Evaluation of existing tidegates and culverts at coastal-estuarine NWRs.
- Assistance with CCPs for estuarine NWRs.
- Continue ongoing fish and habitat surveys.

E. Regional programs and issues directly affecting NWR-CRFPO efforts—Strategic Habitat Conservation

Strategic habitat conservation is being applied in R1 and nationally as an organized approach to conservation. Although an intent is to fully involve the USGS, doing so has yet to occur. The approach is similar to R1 cross program recovery efforts, which has been successful in the Willamette Valley, in that the Service has worked across programs in how resources were used on activities together with those of other agencies. In a memo from the RD in December, SHC was described as our new business model and eight focal areas, with associated teams, were established. The teams developed SHC action plans identifying focal species, issues, partners, existing plans, and status of SHC application relative to focal species. Characteristics of action plans were: Most identified four focal species; Climate change was cited as an issue in all, and invasive species were cited in four; Plans averaged 22 partners; and Population objectives were noted for 12 species, with 5 specific to focal areas.

So what are the next steps? A memo from the RD is forthcoming to describe the steps. The plan is to hold a meeting in June attended by two members from each of the focal area teams. Each

team will be asked to identify their highest priority, short-term actions, and develop brief statements of work for the top two. These will be discussed at the workshop in June. Although there will not be any new funds next year, the ARDs can consider the actions and see if a few of the actions can be funded.

There are several other activities related to SHC within the region. An intranet site is being developed describing SHC activities in R1, which will be linked to the national site. There have been meetings with OMB and conservation partners focused on funding and capacity. A dozen regional and field employees are receiving training on collaboration and structured decision making from PSU.

A number of comments were made. One was there needed to be more guidance concerning SHC and direction about the types of actions that are not likely to be funded so that resources could be directed to actions contributing to SHC. Another was to evaluate what elements of SHC to which each Service program is most able to contribute, such as Fisheries for monitoring and evaluation of aquatic habitat and populations. Another was that it is good to see things starting to move relative to SHC, overall.

III. Action Items

The following are action items resulting from the 2008 NWR-CRFPO Workshop. Some are activities for ongoing projects and assistance that the CRFPO has been engaged with NWRs during the past, as well as needs for which resources and plans have yet to be developed. These will be pursued to the extent possible.

1. At Julia Butler Hansen NWR:

- Complete first year of post-construction assessment of tide gates at Tenasillahe Island during summer 2008.
- Plan for second year of post-construction assessment of tide gates at Tenasillahe Island anticipated for 2009, incorporating fish trapping to evaluate passage at the gates, fish residence times in the slough, and net pen studies to evaluate fish growth.
- Complete second year of pre-construction assessment of mainland sloughs during summer 2008, develop proposal for post-construction assessment for 2009 or 2010.
- Assist with habitat restoration planning for Risk and Nelson creeks.

2. At Willapa NWR:

- Assist with restoration planning for salt marsh habitat at the southern portion of the bay, assessment of coastal cutthroat trout planted in refuge streams, and survey techniques.
- Assessment of potential fish hosts for juvenile mussels present in refuge streams.

3. At Oregon Coast NWRs:

- Complete post-construction assessment of fish and habitats at Nestucca Bay NWR during summer 2008.
- Continue pre-construction assessment of fish, habitats, and aquatic invertebrates at Bandon Marsh NWR.

- Assessment of tide gates and culverts as potential barriers to fish passage at coastal NWRs.
4. At Ridgefield NWR:
 - Assist with the development of a watershed assessment for Gee Creek
 - Assessment of fish passage at the mouth of Gee Creek and fish presence and habitats in Gee Creek, Post Office Lake, and Campbell Slough.
 5. Participate in upcoming regional SHC assignments and explore opportunities for NWRs and Fisheries to jointly further application of SHC and address aquatic resource needs.
 6. 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.
 - Continue to work with NWRs to develop FONS and other proposals for sources to fund activities to meet aquatic resource issues and needs.
 7. Unless otherwise advised, the CRFPO will organize annual workshop for April 2009 to promote effective information exchange and further develop working relationship between programs.

Appendices

Appendix A

NWR-FISHERIES WORKSHOP AGENDA

May 1, 2008

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 12 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 2008 workshop document with action items.
5. Schedule 2009 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 12 months
 - 8:40-9:20 Julia Butler Hansen-Lewis and Clark NWRs: Part I--Fish use, habitats, and tidegates at sloughs on Columbia River islands; Part II--Fish use, habitats, and tidegates at sloughs on the mainland unit (Johnson)
 - 9:20-9:40 Nestucca Bay NWR: Fish and habitat surveys (Hudson)
 - 9:40-10:00 Bandon Marsh NWR: Assessment of tidal marsh restoration (Hudson)
 - 10:00-10:20 Hanford Reach NM: Instream habitat studies (Skalicky)
 - 10:20-10:40 Break
3. NWR Aquatic Resource Activities and Issues
 - 10:40-11:00 Transfer of a western pearlshell mussel population to Willapa NWR (Fernandez)
 - 11:00-11:20 Water management at Tualatin NWR (Schmidt)
 - 11:20-11:40 Water studies at Malheur NWR and other water related topics (Crammond)
 - 11:40-12:00 Questions and discussion on morning presentations
 - 12:00-1:00 Lunch

4. Activities on 2007 Workshop Action Items

1:00-1:30 Status of action items and related topics (Lohr)

5. NWR updates and new issues and needs

1:30-3:00 Open discussion of new NWR issues and needs, updates on previous issues and needs, CCP schedules and progress, upcoming work, etc.

3:00-3:20 Break

6. Regional programs and issues affecting NWR-CRFPO efforts

3:20-3:40 Strategic Habitat Conservation (Chris McKay, co-chair R1 SHC Coordination Team)

3:40-4:20 Discussion

4:20-4:30 Wrap-up

Appendix B

Workshop Attendees

Donna Allard	CRFPO
Mark Bagdovitch	RO Fisheries
Ruby Bourne	CRFPO
Forrest Cameron	RO Refuges
Justin Cook	CRFPO
Lynn Cornelius	WSU Extension/Ridgefield NWR
Dar Crammond	RO Water Resources
Tim Cummings	CRFPO
Doug DeHart	RO Fisheries
Joe Engler	Ridgefield NWR
Vicki Finn	RO Fisheries
Bob Flores	Ridgefield NWR Complex
Kevin Kilbride	RO Refuges
Marie Fernandez	Willapa NWR
Paul Heimowitz	RO Fisheries
Kathy Hollar	RO Ecological Services
Amy Horstman	OFWO
Mike Hudson	CRFPO
Jeff Johnson	CRFPO
Rich Johnson	RO Fisheries
Sam Lohr	CRFPO
Roy Lowe	Oregon Coast NWR Complex
Chris McKay	RO Migratory Birds
Fred Paveglio	RO Refuges
Bob Peyton	RO Refuges
Tim Roth	CRFPO
Pete Schmidt	Tualatin NWR
Jennifer Brown-Scott	Ridgefield NWR
Joe Skalicky	CRFPO
Charlie Stenvall	Willapa NWR Complex
Linda Watters	RO Refuges
Ralph Webber	Tualatin NWR
Tim Whitesel	CRFPO
Rebecca Young	RO Refuges

Appendix C

NWR-FISHERIES WORKSHOP NOTES

May 1, 2008

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 12 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 2008 workshop document with action items.
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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 of the workshops and objectives. Everybody introduced themselves.

2. CRFPO results and activities during past 12 months

Julia Butler Hansen-Lewis and Clark NWRs: Part I--Fish use, habitats, and tidegates at sloughs on Columbia River islands; Part II--Fish use, habitats, and tidegates at sloughs on the mainland unit (Johnson)

Jeff presented two ongoing projects to evaluate tide gates in the lower Columbia River at the mainland of Julia Butler Hansen NWR, and also on Tenasillahe and Welch islands at the refuge. The Army Corps is replacing tide gates for both projects, with the mainland work under the 536 Program and the island work under the Columbia River Channel Improvement Project. Both projects involve comparing fish and aquatic habitats at sloughs with tide gates to reference sloughs without tide gates during two time periods, before and after construction of new gates. Jeff discussed fish community composition, passage rates of salmonids, and habitat variables observed during 2007, which is the first year (out of two planned) for collecting pre-construction data at the mainland. Overall, juvenile Chinook salmon had higher passage rates into reference

sloughs compared to sloughs with tide gates. Tide gates at some sloughs may be constructed or modified during 2009 and with remaining ones completed in 2010.

At the islands, pre-construction data were collected during 2006 and 2007, before tide gates were replaced in the large slough at Tenasillahe Island in 2007. Habitats differed between sloughs with tide gates on Teansillahe Island compared to reference sloughs without tide gates on Welch Island. Gated sloughs consistently had lower dissolved oxygen, higher turbidity, earlier warming of water temperatures, and a prevalence of aquatic vegetation relative to habitat conditions in reference sloughs. The fish community also had a higher proportion of introduced species in gated sloughs compared to reference sloughs. Based on the frequency and duration that the tide gates were open, fish would have limited opportunity to enter and leave the large Tenasillahe Island slough. Two juvenile salmon were collected inside the slough and over 100 juvenile Chinook salmon were captured leaving it. Residence time within sloughs were estimated by releasing and recapturing marked (fin clip) juvenile Chinook salmon in a reference slough, and by releasing juvenile Chinook salmon with PIT tags in the large Tenasillahe Island slough and subsequently detecting fish with an array at the tide gates. Most marked fish left the reference slough within the first two days after release, with the maximum residence time of 10 days. Fish leaving the gated slough were detected for up to 73 days, with a mean residence time of 26 and 39 days during 2006 and 2007, respectively.

Nestucca Bay NWR: Fish and habitat surveys (Hudson)

Mike presented results of work to evaluate physical and biological responses to restoring tidal marsh habitat at Nestucca Bay NWR. A dike and tide gate was removed and large wood added to provide structure in existing channels during summer 2007. The CRFPO collected pre-construction data during winter-early summer 2007 and will continue to collect post-construction data through summer 2008. Data collected earlier by the Siletz Tribe may also be useful for characterizing pre-construction conditions. For habitat, a hypothetical hydrologic model has been developed using existing GIS data from the tribe and DU showing water inundation of the restoration site. This needs to be repeated incorporating physical changes of the post-construction period. Preliminary results for fish look like coho salmon have increased since construction, and may be steelhead, too. Invertebrate drift samples have been collected for processing later. Question came up about what monitoring such a project is trying to accomplish and how to decide which projects should be monitored, especially with limited funding for projects and monitoring. Documenting accomplishments relative to what is expected from a project is necessary for securing project funding and what was actually accomplished, as well as being able to use what can be learned for other projects. Mike noted some problems with having a relatively short pre-construction period to collect data. Because the Nestucca Bay site originally had a broken tide gate on a three-foot culvert, a temporary tide gate had to be installed prior to construction to dry the area for construction. The temporary gate was in during the spring sampling so that it probably would not be a good indication of pre-construction conditions then.

Bandon Marsh NWR: Assessment of tidal marsh restoration (Hudson)

Mike discussed ongoing work at Bandon Marsh NWR, which is similar to the Nestucca Bay NWR project but on a much larger scale. The NWR is next to the Coquille River, and will be restoring over 400 acres of tidal wetland habitats by removing dikes, tide gates, and potentially filling up to 15 miles of ditches. Construction for the project may occur in 2009 or 2010. Cross Program Results funds from Refuges were secured and have allowed the CRFPO to collect physical and biological data prior to construction. Sampling has been focused on Fahey Creek, which is one of three tributaries that cross the NWR and has a tide gate at the river. So far three fish surveys have been conducted (November 2008, January and April 2008). Seven native (coastal cutthroat trout, steelhead, coho salmon, Chinook salmon, sculpin, threespine stickleback, and shiner perch) and three non-native (mosquitofish, brown bull head, and smallmouth bass) fish taxa have been collected during these seasonal sampling trips. Invertebrate drift samples were also collected in 2007 and 2008, and preserved for later analysis.

Hanford Reach NM: Instream habitat studies (Skalicky)

Joe gave an overview of the instream flow and habitat assessment work that the CRFPO has been conducting over the past few years at the Hanford Reach National Monument. The overall goal of the work is to develop tools to help with determining effects of flows on Chinook salmon spawning and rearing, which would be useful in setting flow regimes. Joe focused on one aspect of the work, to estimate the effects of dam operations on stranding and entrapment mortality of juvenile Chinook salmon in the 50-km reach during 2007. Fish stranded in depressions when river flow is low can suffer direct mortality and also be susceptible to stress and predation. Joe described the steps taken to generate estimates of stranding-related mortality, which was about 6% of all the juvenile chinook salmon. The approach used in the project could be applied relative easily to other management questions affecting refuges.

NWR Aquatic Resource Activities and Issues

Transfer of a western pearlshell mussel population to Willapa NWR (Fernandez)

Marie presented work at Willapa NWR to establish western pearlshell mussels in streams at the refuge that do not have mussels. The NWR coordinated surveys with the Freshwater Mussel Workgroup to determine whether the Neselle or Bear rivers were appropriate sources of mussels to introduce into three streams on the refuge that have potential host fish and suitable habitat. The Bear River was the more appropriate donor location. A total of 100 mussels were uniquely marked with tags, and transferred to sites in three NWR streams, Chum, Headquarter, and North creeks in September 2007. To track how the introduced mussels are doing, monthly surveys have been conducted to count individuals and record changes in length and weight. Surveys are also looking for evidence of recruitment. Questions were asked concerning whether mussels were historically in the refuge streams and of any disease or policy issues. Mussels have not been observed in the streams, but assumed to have been there based on habitat. The transfer was permitted by WDFW, and NWR policy allows translocation and re-introductions.

Water management at Tualatin NWR (Schmidt)

Pete discussed water management at Tualatin NWR relative to passage issues, operational issues, and current and future concerns. Much of the water at the refuge is managed for flooding wetlands to provide habitat for many species and native vegetation. For fish passage, recently built water control structures have notched gates to allow juvenile salmonids to leave flooded wetlands. Notches may be added to older structures. For operational issues, wetlands are required to be drawn down by the end of April to prevent potentially adding warm water to the river. The NWR would like to maintain wetlands longer for bird habitat and reducing reed canary grass. The NWR is doing some temperature monitoring. The NWR is also looking at shallow wells for water because they are cheaper than pumping river water. Current and future concerns are the under-sized capacity of the Chicken Creek structure to handle present flows, whether the Rock Creek culvert is a barrier, and further reduction of flows and isolation of the Tualatin River floodplain if plans to increase the capacity of Hagg Lake by raising Scoggins Dam are ultimately carried out.

Water studies at Malheur NWR and other water related topics (Crammond)

Dar described work that the Water Resources Branch is doing to assist Malheur NWR in securing a water right for October-March. A number of groups opposed the water right application, but came to a settlement agreement with four requirements that needed to be met for the right to be issued. The requirements are: A water measurement plan, Water quality plan, Fish passage and screening, and Flow study for redband trout. The water measurement plan is completed and has been accepted. The water quality plan is in process with ODEQ. The refuge will provide fish passage and screening, but estimates that it will take several million dollars and years to complete. The redband flow study is underway with ODFW and some assistance from USGS. Some issues with the study has been personnel turnover, flows may have altered survey transects, and insufficient information on habitat requirements of redband trout.

Dar also discussed involvement in a nation-wide assessment of water needs for the Service. He focused on R1 and R8. Estimated cost for meeting water needs for NWRs and hatcheries in both regions was about \$500M. Water Resources is developing a data base for water needs and analyses.

4. Activities on 2007 Workshop Action Items

Status of action items and related topics (Lohr)

Sam gave an overview of activities supporting action items identified at the previous workshop. Activities consisted of ongoing projects such as assessments of tide gate and estuary habitat restoration presented earlier, fisheries assistance such as contributing to CCPs, and requesting a meeting with the ARDs for refuges, fisheries, and ES to discuss project priorities, credit sharing, and dedicated resources for monitoring and evaluation. The presentation given at the ARD meeting was made. Overall, the ARDs felt that sharing credit among programs was expected and not a big issue and that many of the issues discussed could come under SHC. A follow-up memo with recommended actions from Howard, Fred, and Kathy was sent after the meeting, but there has been no response. Relative to other topics, SHC focal area teams, made up of

representatives from NWRs, Fisheries, ES, and migratory birds, were formed and developed action plans for eight areas in R1.

5. 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, etc.

For Willapa NWR, Marie noted that they would like to know whether cutthroat trout introductions were successful, how to conduct population and habitat surveys, and info on the DU study of the fish ladder. Charlie noted their top priority is help determining potential effects of removing a dike at the south end of the bay to restore salt marsh habitat. They have a contractor looking at western brook lamprey, and would also like more info on fish hosts of mussels. Vicki mentioned that NWR participation with the lamprey workgroup would be welcome. At JBH, there might be opportunities for restoration on Risk and Nelson creeks.

For Ridgefield NWR, Lynn noted that there is need to know more about lamprey, mussels, and cutthroat trout in Gee Creek. There are shells at the mouth and lamprey were collected in the past. Support to conduct watershed assessment and info on whether the mouth is a barrier is needed. Bob noted that knowing fish species in Post Office Lake and Campbell Lake and Slough would be useful because a county dike is failing that may connect Post Office Lake to the river, wondering about the potential for fish entrapment.

For Oregon Coast NWRs, Roy noted the need for more and recent information for all NWRs, continuation of assessments at Bandon Marsh, and assistance with CCPs. Property has been acquired at Siletz Bay that is isolated by the highway. Also more info on tide gates and culverts that may be barriers are needed.

6. Regional programs and issues affecting NWR-CRFPO efforts

Strategic Habitat Conservation (Chris McKay, co-chair R1 SHC Coordination Team)

Chris described SHC as a new business model for the Service that emphasizes working horizontally among programs as well as among partner agencies. It is an organized approach for conservation that is being applied nationally within all the Service regions. Steve Miller is the R1 representative on the national SHC team. The approach is designed to bring in the USGS, but it has not occurred. The approach is similar to how R1 has done cross program recovery actions in the Willamette Valley where several programs worked together and coordinated funding activities for endangered species. Chris described the process of forming SHC teams in each of eight focal areas throughout R1, and the assignment to develop action plans that included identifying focal species and documenting issues, partners, existing plans, and the status of SHC implementation for focal species. Overall, most of the eight plans had four focal species, averaged 22 partners, cited numerous plans, climate change was noted as an issue in all and invasive species noted in four plans. As far as implementation of SHC, population objectives exist for 12 species with 5 specific to individual focal areas.

The RD wants to move forward with SHC and will be sending out a memo with the next steps. The idea is to hold a meeting in June attended by at least two members from each focal area team. The teams are to identify their highest priorities and come up with brief statements of work for their two most pressing short-term projects. Budgets are flat and there will be a new administration, but the ARDs might be able to funds a few of the projects.

Chris noted other SHC activities going on at the regional level. These include developing a R1 intranet site and sending about 12 people from the RO and field offices to training at PSU concerning collaboration and structured decision making. The Service has met with OBM, the association of fish and wildlife agencies, and other conservation partners trying to generate interest and traction for SHC. There is about \$68M a year going to state comprehensive conservation strategies.

Comments made dealt with the need for more guidance about SHC and direction dealing with the types of things that we are not going to do so that funding could be directed toward actions specific for SHC. A suggested approach was to look at what each program can contribute to certain aspects of SHC, like fisheries focusing on monitoring and evaluation of aquatic habitats and populations.

Appendix D
Workshop Presentations

**Columbia River estuary habitat restoration:
Does it work?**

Lewis and Clark NWR
Julia Butler Hansen NWR

**Julia Butler Hansen National Wildlife Refuge:
Assessment of Fishes, Habitats, and Tide gates in
Sloughs on the Mainland**

**Lower Columbia River Channel Improvement:
Assessment of Salmonid Populations and Habitat on
Tenasillahe and Welch Islands**

Study goal: Evaluate the overall effectiveness of JBHNWR slough habitat restoration

- Pre and post restoration evaluation
- Reference and treatment study areas

**Julia Butler Hansen National Wildlife Refuge:
Assessment of Fishes, Habitats, and Tidegates in
Sloughs on the Mainland: 2007**

Study goal: Evaluate the overall effectiveness of JBHNWR slough habitat restoration

- Pre and post restoration evaluation
- Reference and treatment study areas

**Opportunity
and
Habitat Quality**

Can fish get in?
Are fish happy that get in?

- Two reference sloughs
- 38 sample reaches (minimum 3)
- Lower-most reach included
- Random selected
- Habitat (width, profile, etc)
- Fish community (seine)
- Temp and DO loggers

JBHNR: Assessment of Fishes, Habitats, and Tide gates in Sloughs on the Mainland

Objective 1: Determine whether adult salmonids are present in the upper reaches of tributaries before and after Restoration.

Objective 2: Assess the periods and frequency that tide gates allow passage by juvenile and adult salmonids.

Objective 3: Describe fish community inhabiting sloughs and compare to that observed at reference sloughs.

Objective 4: Characterize habitats at mainland sloughs and compare to that observed at reference sloughs.

Objective 1: Determine whether adult salmonids are present in the upper reaches of tributaries before and after Restoration.

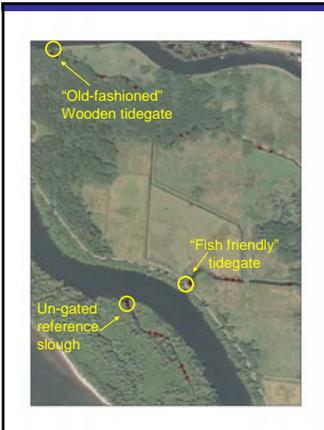
Conduct surveys for adult anadromous salmonids and evidence of spawning in the upper reaches of the tributaries.



Results

2006 Chum and Coho present in Nelson
No evidence in Risk Creek

2007 Coho present in Nelson
No evidence in Risk Creek
Spawning habitat available in Nelson Creek
Unlikely that Adults are using Risk creek due to habitat type and quality.



Objective 2:
"Opportunity" = rate of passage
Measure fish ability to pass tide gates relative to un-gated reference sloughs

- Fish presence outside sloughs (tidegates)
- Rate of fish movement into sloughs

Conducted trapping operations at all tide gates (seine only at Brooks)

	Chinook per hr (inside)	Coho per hr (inside)
W 259 (B)	0.591	0.286
Duck Lake	0.244*	0.136
W 201 (P)	0.177	0.478
Hunting	1.116	0.550
Steamboat	3.227	0.297

* 17 of 18 Chinook were captured during one trap set

Brooks slough Seining

Captured 8 Chinook (0.086/m²) and 1 Coho (0.011/m²) inside of the tide gates
Captured 6 Chinook outside tide gates (0.020/m²)

Objective 3: Describe fish community inhabiting sloughs and compare to that observed at reference sloughs.

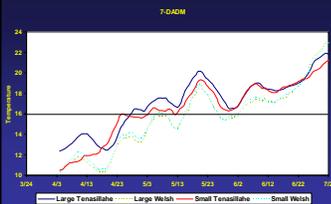


Fish Species	Total	Fish Species	Total
Ellison Slough	3-spine Stickleback 14	Duck Lake	3-spine Stickleback 14
	Peamouth 9		E. Banded Killifish 8
	Unknown Sunfish 7		Bull Frog 2
Hampson Slough	3-spine Stickleback 44	Brooks Slough	3-spine Stickleback 19
	Bull Frog 26		Unknown Sunfish 17
	Yellow Bullhead 1		Chinook Salmon 8
Indian Jack Slough	3-spine Stickleback 5	W 201 (P)	3-spine Stickleback 151
	E. Banded Killifish 1		Chinook Salmon 74
Winter Slough	Bull Frog 111	W 259 (B)	3-spine Stickleback 36
	3-spine Stickleback 36		Chinook Salmon 4
	Salamander 3	S. Hunting E.	3-spine Stickleback 69
			Chinook Salmon 8
		Steamboat	3-spine Stickleback 114
			Chinook Salmon 34

Objective 4: Characterize habitats at mainland sloughs and compare to that observed at reference sloughs.

Describe water quality characteristics in the sloughs.
-Temp/DO loggers

Describe physical characteristics in the sloughs.



Accomplishments

- Fall 2006 and 2007 spawning ground survey
- Conducted fish community and habitat work in 2007
- Conducted opportunity trials in gated and reference sloughs in 2007

Future

- 2008 – second year pre-construction evaluation (incorporating 2007 experience)
- PIT arrays (2008-??)
- 2009-2010 Post-construction evaluation

Lower Columbia River Channel Improvement: Assessment of Salmonid Populations and Habitat on Tenasillahe and Welch Islands



Study goal: Evaluate the overall effectiveness of Tenasillahe island slough habitat restoration

- Pre and post restoration evaluation
- Reference and treatment study areas



Lewis and Clark NWR

Julia Butler Hanson NWR



• Tenasillahe Island Interim Restoration (Tidegate/Inlet Improvements)

- Goal: Increase access/egress for ocean-type salmonids; improve access for adult salmonids
- Type of restoration: Backwater/side-channel reconnection to Columbia River
- Area affected by restoration: 92 acres



• Tenasillahe Island Long-term Restorations (Dike Breach)

- Goal: Provide rearing habitat for ocean-type salmonids
- Type of restoration: tidal marsh and swamp; shallow water and flats habitat
- Area affected by restoration: 1,778 acres



Objectives

1. Characterize habitats in the sloughs on Tenasillahe Island and compare it to that observed at the reference sloughs on Welch Island..
2. Describe presence, distribution, and biological characteristics of salmonids inhabiting sloughs on Tenasillahe (treatment) and Welch (reference) Islands.
3. Assess frequency and duration of time that tidegates allow passage by juvenile salmonids.
4. Describe the movement of juvenile salmon in and out of the sloughs as well as their residence in and use of the sloughs on Tenasillahe and Welch Islands.

Objective 1: Characterize habitats in the sloughs on Tenasillahe Island and compare it to that observed at the reference sloughs on Welch Island.

- Describe water quality characteristics in the four sloughs.
- Describe physical characteristics in the four sloughs.



Describe water quality characteristics in the four sloughs.

- Temperature
- DO%
- Conductivity
- pH
- Turbidity
- Transparency



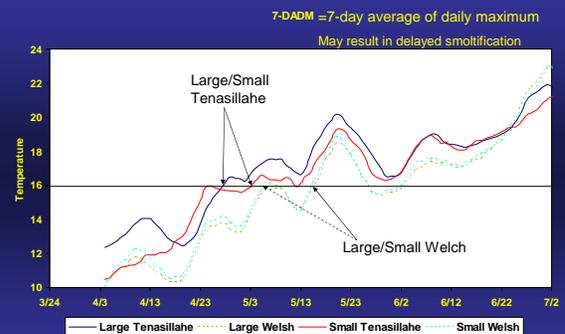
	DO (%)	Conductivity (µs)	pH	Turbidity (JTU)	Transparency (cm)
LTS	59.7	1238.8	6.9	23.1	47.1
STS	75.2	144.7	7.5	9.2	70.5
LWS	92.3	160.7	7.2	7.5	91.4
SWS	87.8	160.3	7.1	2.5	118.0



Describe physical characteristics in the four sloughs.

	LTS	STS	LWS	SWS
Physical Cover Trial #1	Aquatic Vegetation Woody Debris	Overhanging tree/shrub Woody Debris	Woody Debris Overhanging Tree/Shrub	Woody Debris Overhanging Tree/Shrub
Physical Cover Trial #2	Aquatic Vegetation (10-40%)	Aquatic Vegetation (50-100%)	No Change	No Change

Water temp comparisons



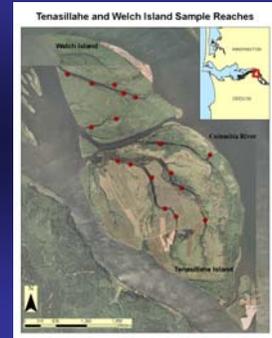
Objective 1 Conclusions

- Habitat differences evident between Welch and Tenasillahe sloughs
 - Daily temperature fluctuations are greater in Welch sloughs
 - Seasonal temperature variations greater in Tenasillahe sloughs
 - Tenasillahe warms sooner in the spring
 - DO levels consistently lower, turbidity higher in Tenasillahe
 - Daily fluctuation is unknown
 - Aquatic vegetation becomes more pronounced during spring in Tenasillahe sloughs



Objective 2: Describe presence, distribution, and biological characteristics of salmonids inhabiting sloughs on Tenasillahe (treatment) and Welch (reference) Islands.

- Identify fish sampling units
 - accomplished in 2005
- Survey fish and record biological characteristics (traps fykes and seines).
- Estimate ability of fish surveys to detect juvenile salmonids, i.e. calculate efficiency (will be discussed with objective 4).



Percentage of total fish captured by native and non-native taxa 2006.

Island Slough	Native	Non-Native	Native (Excluding Stickleback)	Non-Native (Excluding Stickleback)
Large Tenasillahe	83.4%	16.6%	18.9%	81.1%
Small Tenasillahe	80.0%	20.0%	80.0%	20.0%
Large Welch	99.9%	0.1%	95.3%	4.7%
Small Welch	99.7%	0.3%	83.0%	17.0%



Species and size of salmon captured 2006

Island	Species	Total	Size Range (mm)
Tenasillahe Island	Chinook	1	46
Tenasillahe Island	Chum	1	46
Welch Island	Chinook	270	36-195
Welch Island	Chum	6	44-50
Welch Island	Coho	1	47



Objective 2 Conclusions 2006

- Fundamental difference in fish communities between island sloughs.
- Salmon distributed **throughout Welch Island Sloughs**.
- Salmon were found in vicinity of tidegates outside Tenasillahe Island Sloughs **but none within the Slough**



Objective 3: Assess frequency and duration of time that tidegates are likely to allow passage by juvenile salmonids.

- Conduct periodic observations of the tidegates during various periods during the tidal cycle, over varying tidal extremes, and (if possible) during varying rain events.
- Capture fish entering and exiting sloughs
- Release PIT tagged fish in LTS and detect fish leaving through tide gates

Visual inspection and observation of tidegate function during the tidal cycle.

Small Tenasillahe Slough Tidegate

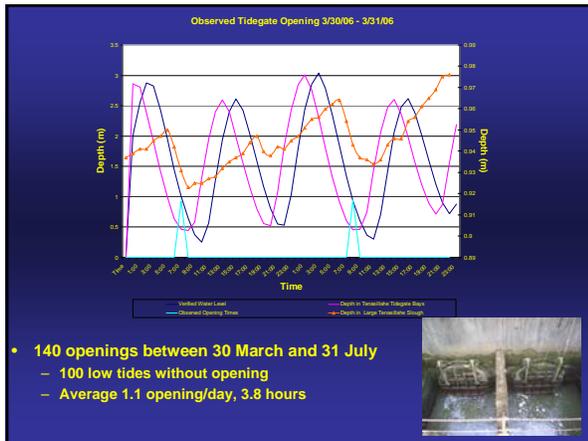
- o 2005 STS tidegate not functional.
- o 2006 refuge personnel blocked open STS tidegate 4/5/06-4/10/06 to remove sediment and debris blocking culvert.
- o After maintenance, STS tidegate was observed opening during low tide.



Visual inspection and observation of tidegate function during the tidal cycle.

Large Tenasillahe Slough Tidegate

- Measuring rods/visual witness
- Data from depth/temperature loggers
- PIT tagged fish detections

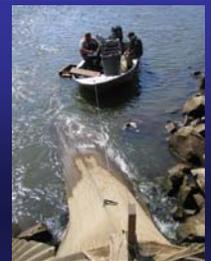


Obj 3: Slough opportunity 2007

The two inside socks : 3-15 through 5-15
Outside sock: 3-22 through 5-16

Entering:
3 Chinook
2 Coho

Exiting:
8 Coho: (3 ad clipped (132,134,139mm), 5 not marked (40-113 mm, X=74.8mm))
2 CCT exiting.
203 Chinook captured leaving



Obj 3: Slough opportunity

Chinook juveniles captured exiting LTS

mark	number	Mean FL (mm)	SD	min	max
PIT	76	79.9 *	5.7	69	109
AD	99	137 *	33.8	67	188
unmarked	28	174 *	40.8	46	204

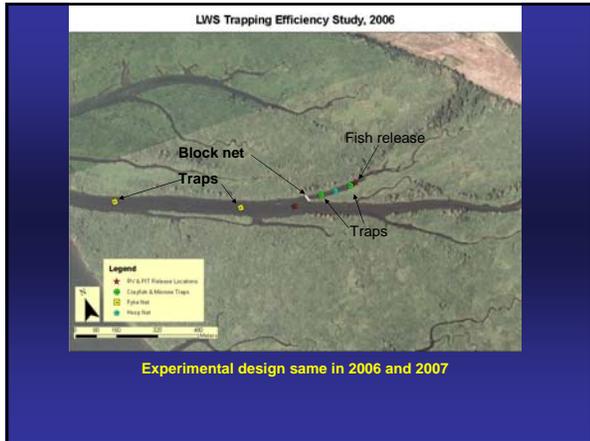
* significantly different among groups



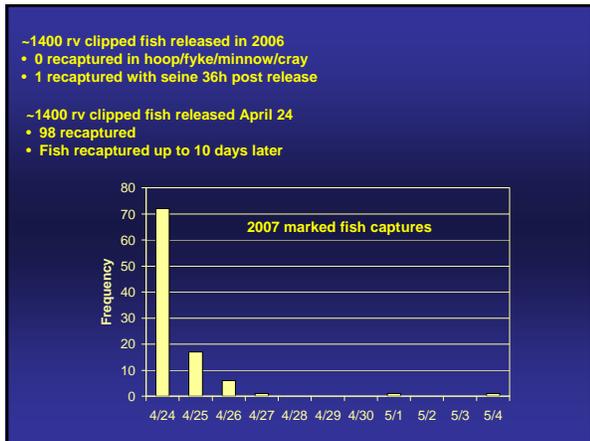
Objective 4: Describe the movement of juvenile salmon in and out of the sloughs as well as their residence in and use of the sloughs on Tenasillahe and Welch Islands.

- Release PIT tagged fish into Large Tenasillahe Slough
 - Determine exit time and survival
- Monitor run-of-river PIT tagged fish
- Release marked fish into Large Welch Slough
 - Determine residence



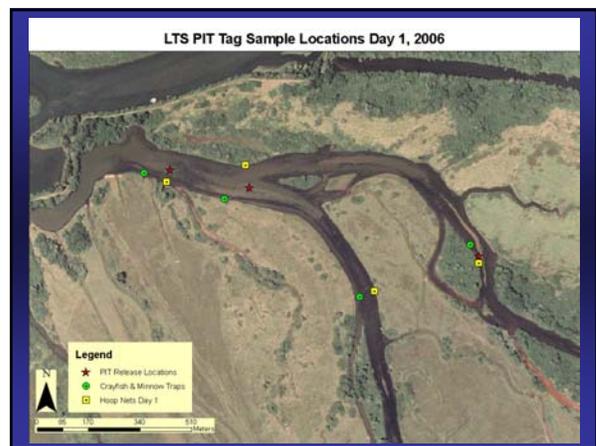


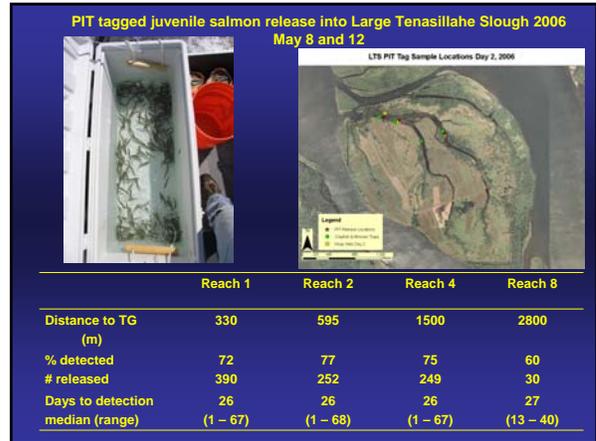
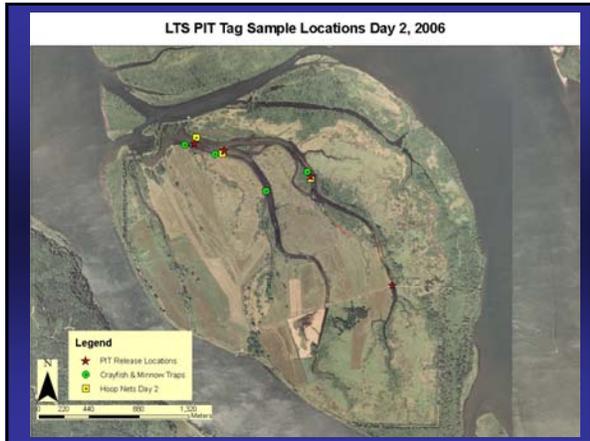
- 1400 rv clipped fish released in 2006
- 0 recaptured in hoop/fyke/minnow/cray
- 1 recaptured with seine 36h post release



- Tagged hatchery fall chinook
 - Released May 8, 2006 or April 17, 2007
 - SST 12mm (full-duplex)

- Large Tenasillahe Slough Tidegate
 - 7' gates
 - Empty into catchments, drain through culvert





2006				
	Reach 1	Reach 2	Reach 4	Reach 8
Distance to TG (m)	330	595	1500	2800
% detected	72	77	75	60
# released	390	252	249	30
Days to detection	26	26	26	27
median (range)	(1 – 67)	(1 – 68)	(1 – 67)	(13 – 40)

2007				
	Reach 1	Reach 2	Reach 4	Reach 8
Distance to TG (m)	330	595	1500	2800
% detected	84	83	81	50
# released	220	225	225	226
Days to detection	38	38	39	41
median (range)	(1 – 69)	(1 – 73)	(1 – 70)	(1 – 68)

Objective 4: Conclusions

- Fish (hatchery) can survive Tenasillahe slough
- No PIT tagged fish entered LTS
- Hatchery fall Chinook will remain 10 days in large Welch slough

Study Accomplishments

- Two years physical habitat and water chemistry between Tenasillahe and Welch sloughs
- Described and contrasted salmonid presence and distribution
- Salmonids can gain access to large Tenasillahe Sloughs with existing tide gate (when do they enter?).

Further Investigations

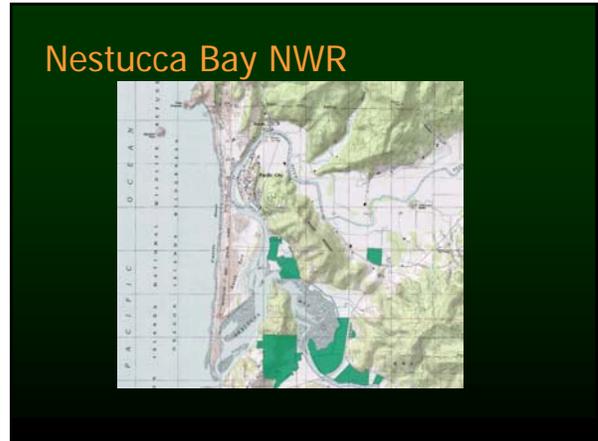
- Gates were modified in summer 2007.....will conduct post-construction evaluation in 2008 and 2009
- Assess tide gate passage
 - Trap at tide gate culverts
 - Measure water velocity during gate opening
- Residence time and use
- Net pen study
 - Measure growth rate among reaches

Nestucca Bay NWR Habitat Restoration Project



*Native Trout Program
Columbia River Fisheries Program Office
Vancouver, WA
April 2007*

Nestucca Bay NWR



Habitat Restoration



Restoration Benefits

- Coastal Cutthroat Trout
- Coho, Chinook, and chum salmon and steelhead
- Other native aquatic species



Goal and Objectives

- Goal
 - Evaluate physical and biological response to habitat restoration
- Objectives
 - Quantify physical characteristics of aquatic habitats relative to suitability for native trout and other salmonids before and after habitat restoration
 - Describe native trout and other salmonid use of the site before and after habitat restoration
 - Collect invertebrates from representative aquatic habitats before and after habitat restoration

Monitoring Timeframe

- Pre-restoration
 - Winter-early summer 2007
 - Other data available
- Post-restoration
 - Fall 2007 – Summer 2008



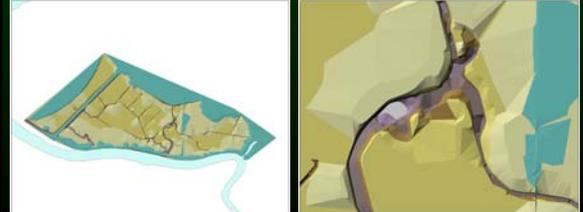
Monitoring Components

- Physical
 - GIS analysis of physical attributes
- Fish
 - Hoop nets
- Invertebrates
 - Pelagic



Approach – Physical

- Used existing DEMs and survey data to develop TIN (terrain model) of the study area



Approach – Physical

- Used existing DEMs and survey data to develop TIN (terrain model) of the study area
- TIN used to develop a hypothetical hydrologic model of the study area
- Replicate approach for post-restoration analysis

Approach - Physical

- Map substrate composition, “riparian” vegetation, and instream/overhanging cover features through biological sampling corridor
- Incorporate into GIS analysis

Approach – Fish

- Systematic hoop net approach
 - 16 sites in study area; 2 sites in reference area
 - All but two of these are sampled using end to end double hoop net approach



Approach – Fish



Approach – Fish

- Sampling schedule
 - March 2007
 - May 2007
 - June 2007
 - October 2007
 - February 2008
 - April 2008
 - June 2008

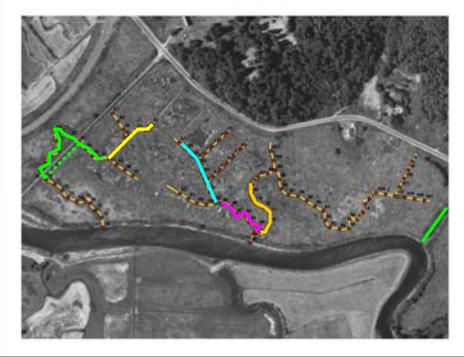


Approach - Invertebrates

- Pelagic
 - Three replicate drift samples collected in five reaches delineated by fish sampling sites
 - Boat drifts



Approach - Invertebrates



Progress to Date



Progress to Date



Progress to Date



Progress To Date

- Physical
 - Preliminary GIS analysis
 - Stage gauges installed
 - Inriver
 - Tidegate
 - Upland



Progress To Date

- Fish
 - Recon trips
 - November and January
 - Sampling
 - Through April 2008



Progress To Date

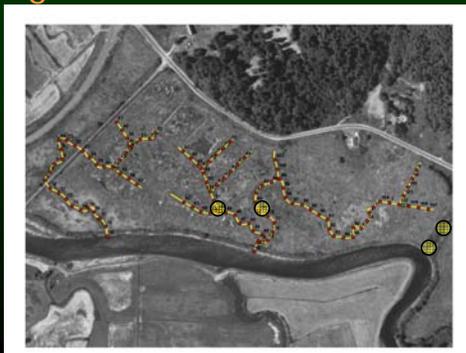
- Invertebrates
 - Spring sampling conducted in 2007 and 2008
 - Samples preserved for later analysis



Progress To Date



Progress To Date



Progress To Date



Progress To Date

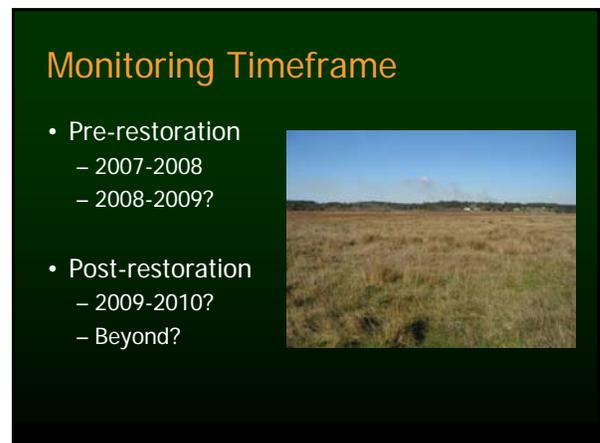
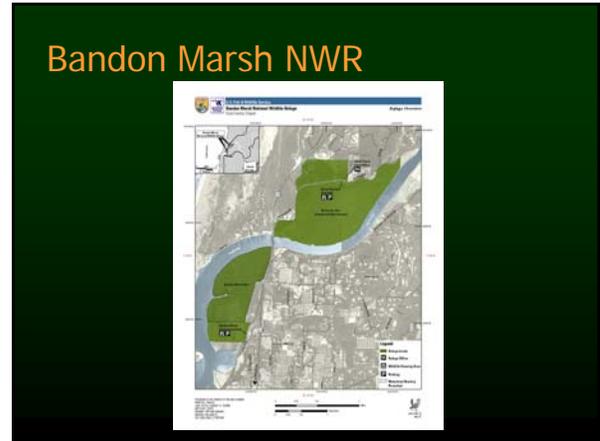
	SKB	SCP	COHO	SHRIMP	CCT	CHN	Chum	STH	Shiner perch	Gunsell fish
Mar-07 Totals	4087	260	140	2081	3	14	1	0	0	0
May-07 Totals	1288	175	80	0	5	92	0	0	24	0
Total	5375	435	220	2081	8	106	1	0	24	0
Oct-07 Totals	3956	121	588	77	1	0	0	0	33	12
Feb-08 Totals	4144	526	438	84	5	1	0	1	0	0
Total	8100	647	1026	161	6	1	0	1	33	12

Acknowledgements



- Siletz Tribe
- Oregon Coast NWR Complex
– Roy Lowe and Dave Pitkin
- Sam Lohr
- Joe Skalicky and David Hines
- Justin Cook, Joel Miller, Greg Silver, and Darby Caton, Sheila Davis
- NFWF





Monitoring Components

- Physical
 - GIS analysis of physical attributes
- Fish
 - Hoop nets
 - E-fishing
- Invertebrates
 - Pelagic



Approach – Physical

- Used existing DEMs and survey data to develop TIN (terrain model) of the study area
- TIN used to develop a hypothetical hydrologic model of the study area
- Replicate approach for post-restoration analysis

Approach - Physical

- Map substrate composition, “riparian” vegetation, and instream/overhanging cover features through biological sampling corridor
- Incorporate into GIS analysis

Approach – Fish

- Systematic hoop net approach
 - 9 sites in study area sampled using end to end double hoop net approach
 - 2 electrofishing reaches



Approach – Fish



Approach – Fish

- Sampling schedule
 - November 2007
 - January 2008
 - April 2008
 - June 2008

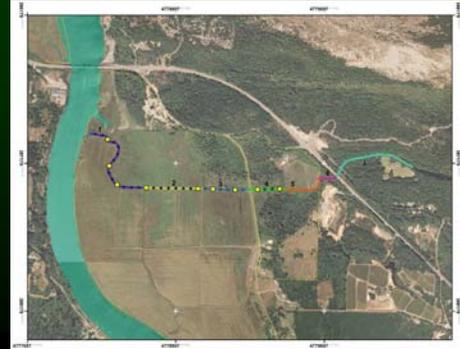


Approach - Invertebrates

- Pelagic
 - Three replicate drift samples collected in five reaches delineated by fish sampling sites
 - Boat drifts (4) and set drifts (6)



Approach - Invertebrates



Approach - Invertebrates



Progress To Date

- Physical - Preliminary GIS analysis



Progress To Date

- Fish
 - Sampling
 - 3 trips
- Invertebrates
 - Spring sampling conducted in 2007 and 2008
 - Samples preserved for later analysis



Progress To Date

- Native species collected
 - Coastal cutthroat
 - Steelhead
 - Coho
 - Chinook
 - Cottids
 - 3-spine stickleback
 - Shrimp
 - Shiner perch
 - Pacific giant salamander
 - Rough-skinned newt
 - Red-legged frogs
 - Mink
- Nonnative Species Collected
 - Mosquito fish
 - Brown bullhead
 - Smallmouth bass

Acknowledgements

- Siletz and Coquille tribes
- Oregon Coast NWR Complex
 - Roy Lowe and Dave Ledig
- Sam Lohr
- Joe Skalicky
- Justin Cook, Sheila Davis, and Greg Silver
- CPR
- John, Dale and Pam



Hanford Reach National Monument: Aquatic Habitat Assessments

May 1, 2008



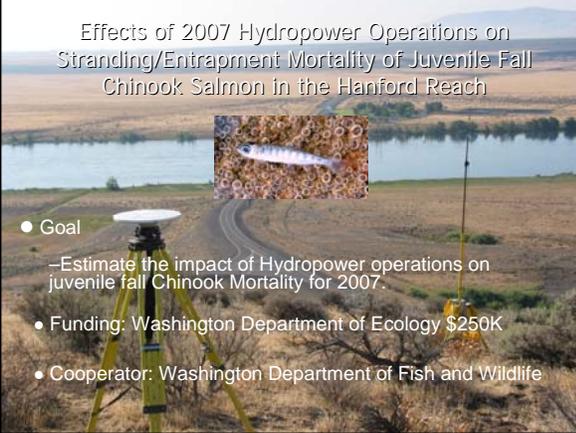
Water Management and Evaluation Team
Columbia River Fisheries Program Office



Hanford Reach National Monument Studies

- Global Goals
 - Provide instream flow and habitat expertise to support Service goals for fishery and aquatic resource management.
 - Develop quantitative assessment tools to evaluate impacts of hydrosystem configuration and operation on fishery and aquatic resources.
 - Work through regional forums to secure streamflows for spawning and rearing fall chinook, as well as other aquatic resources.
 - Support the Service positions regarding hydro operations with the results from our quantitative assessments.

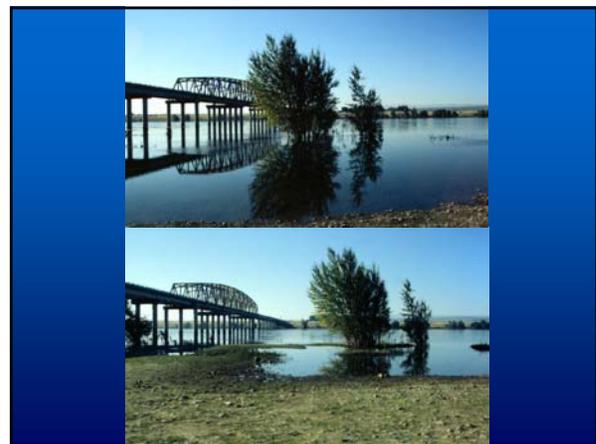
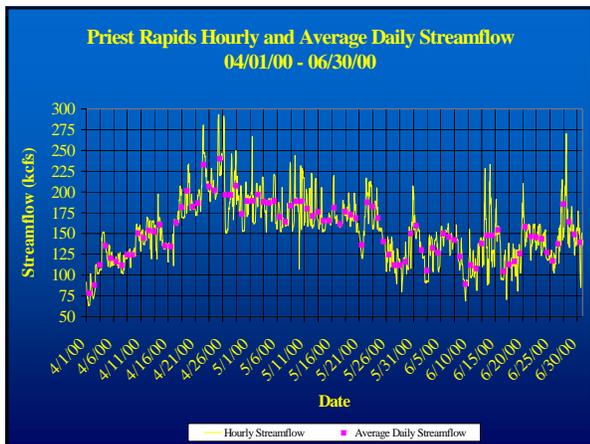
Effects of 2007 Hydropower Operations on Stranding/Entrapment Mortality of Juvenile Fall Chinook Salmon in the Hanford Reach

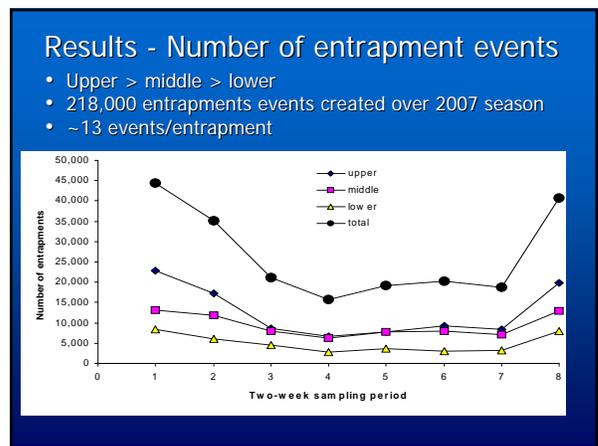
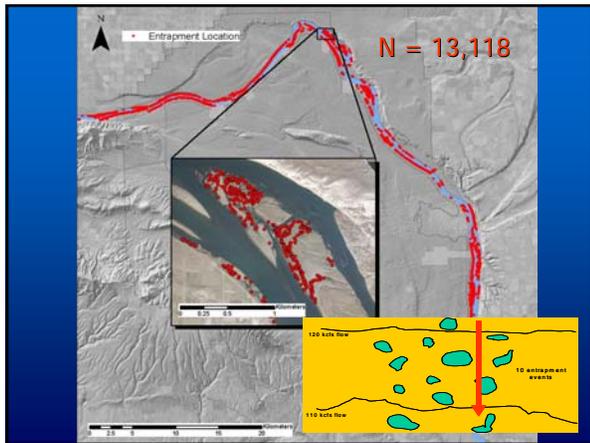
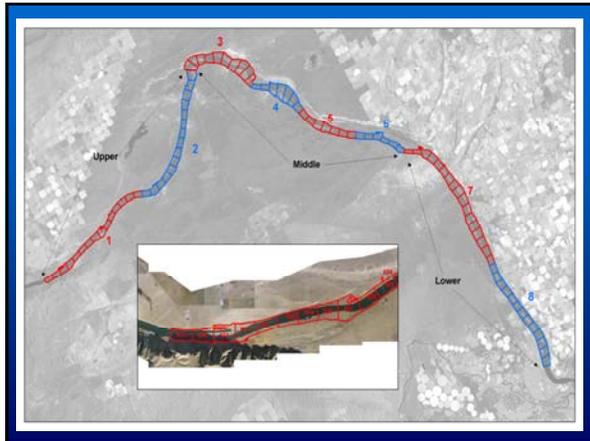


- Goal
 - Estimate the impact of Hydropower operations on juvenile fall Chinook Mortality for 2007.
- Funding: Washington Department of Ecology \$250K
- Cooperator: Washington Department of Fish and Wildlife

Estimating the number of fish entrapped and mortalities

- Determine temporally and spatially stratified mean numbers of fish-per-entrapment.
- Determine the corresponding entrapment event histories.
- Combine mean fish-per-entrapment estimates with entrapment event histories to produce time/area-specific estimates of entrapped fish.
- Combine time/area-specific estimates of entrapped fish with the corresponding lethality rate to determine mortalities.
- Combine time/area-specific estimates of entrapped fish for a Reach-wide entrapment estimate for the 2007 rearing season.
- Combine time/area-specific estimates of mortalities for a Reach-wide mortality estimate for the 2007 rearing season.





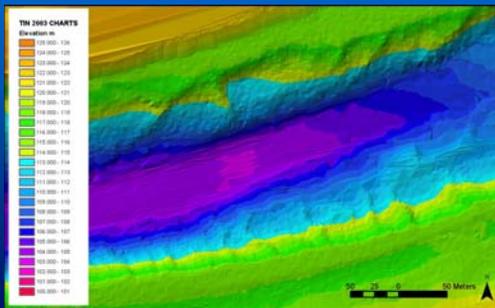
Number of Chinook entrapped & mortalities

- Reach-wide estimate of entrapped Chinook
596,600 95% CI: (100,500, 1,092,700)
 ~45 Chinook/entrapment/season
- Reach-wide estimates of Chinook that were entrapped and died for the entire rearing season
545,200 95% CI: (87,500, 1,003,000)
 ~91%

Other Tools & Methods used for Hanford Reach Studies



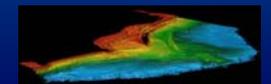
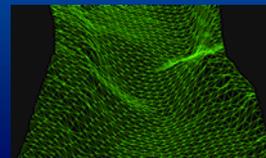
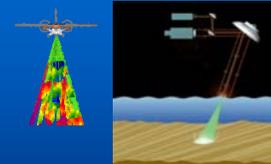
The "Ditch" = Basis for Investigations



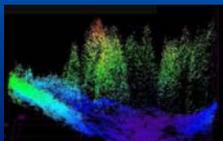
Bathymetric Lidar



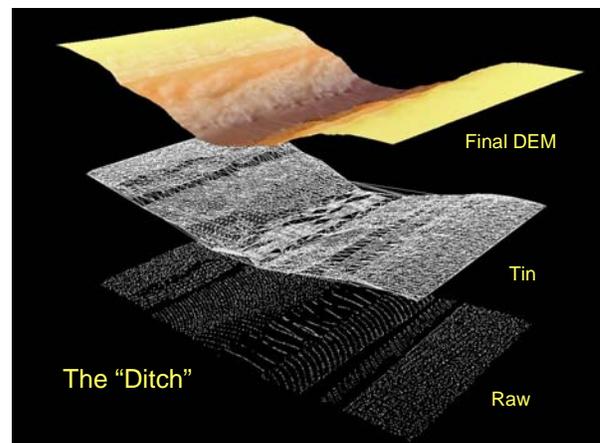
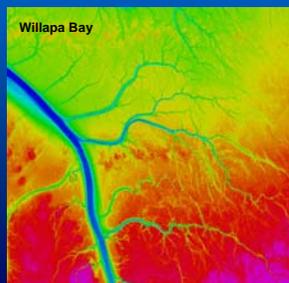
Maximum Depth	60 meters or 2-3 times Secchi depth (Reach 14 m)
Vertical Accuracy	+/- 15 cm
Horizontal Accuracy DGPS	+/- 2 meters
Horizontal Accuracy OTF GPS	+/- 0.5 meters

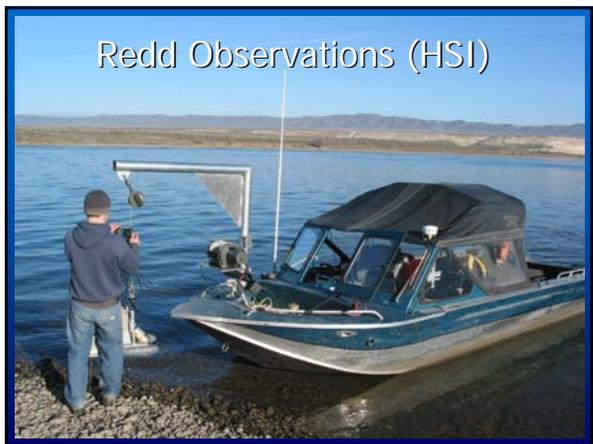
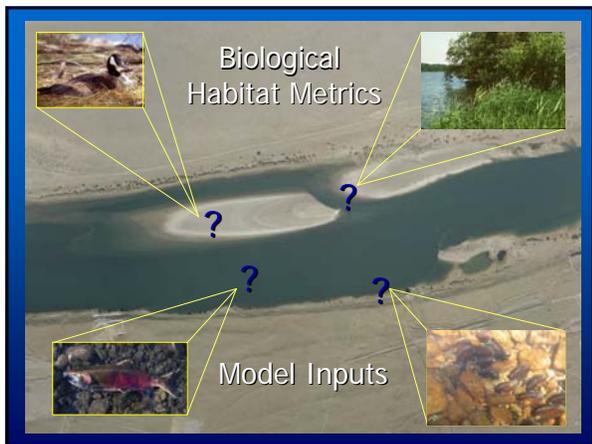
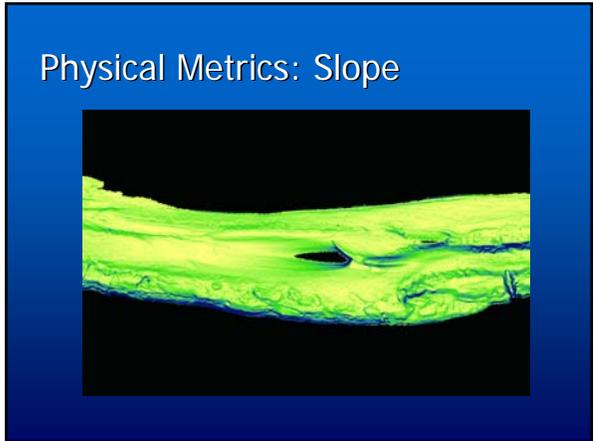
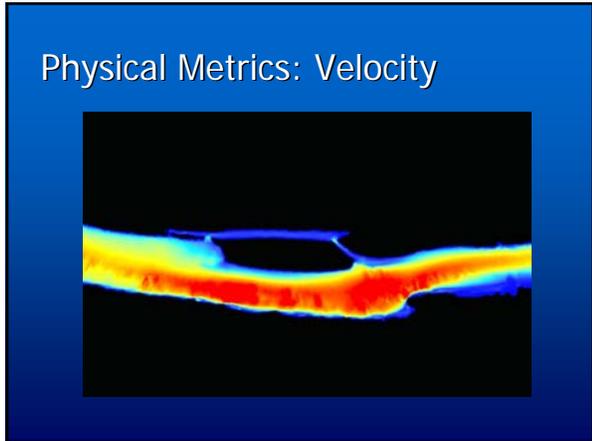
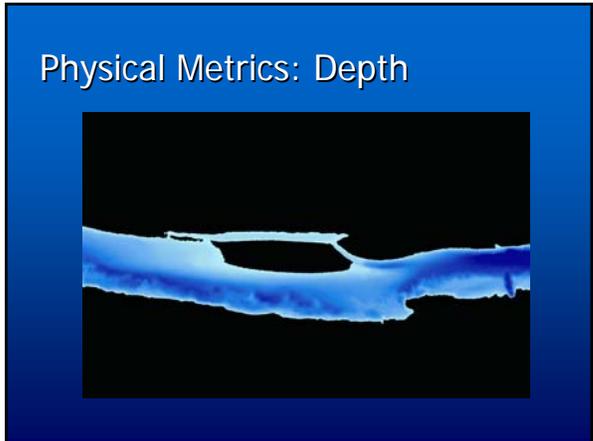
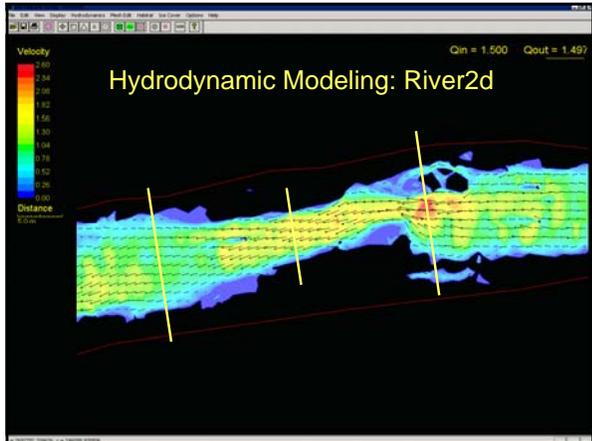


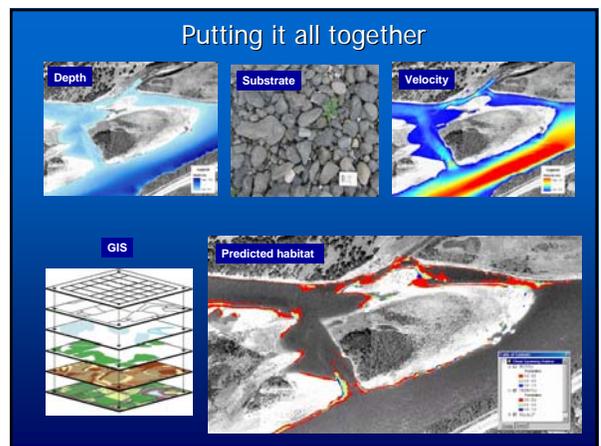
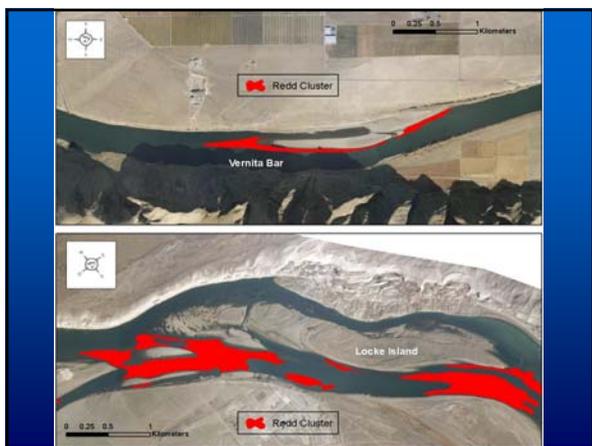
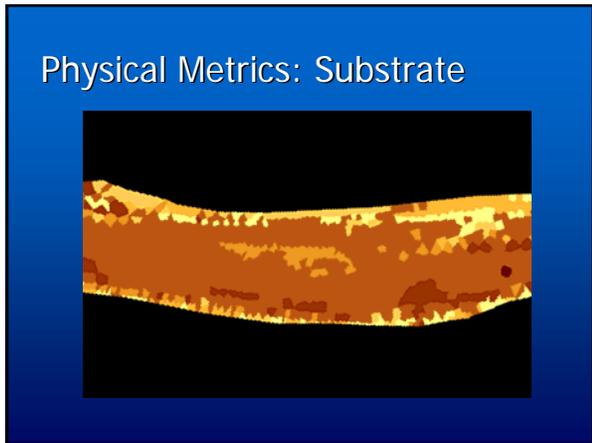
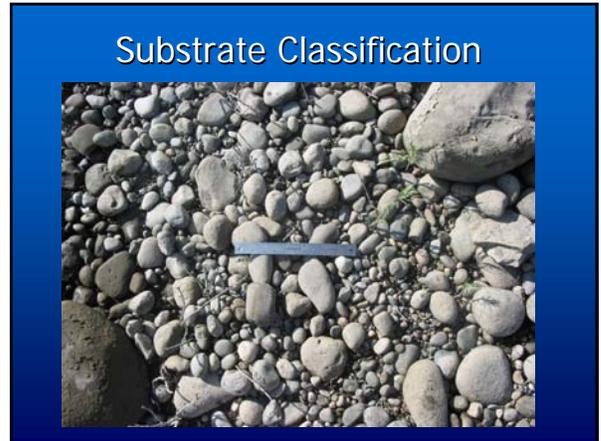
Terrestrial LIDAR (Light Detection and Ranging)

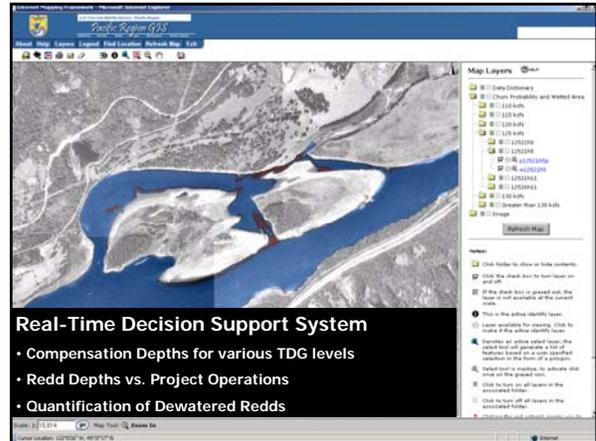
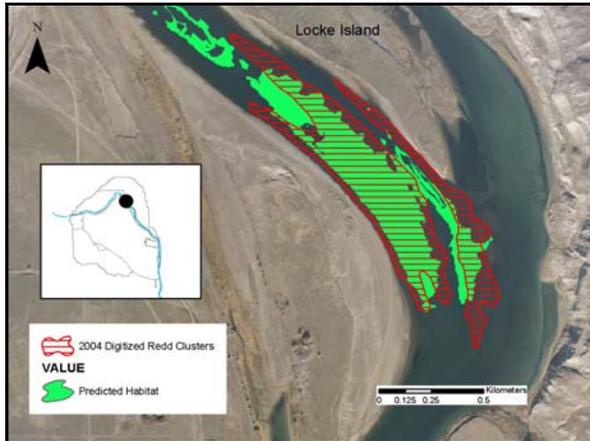


Reflectance Imaging









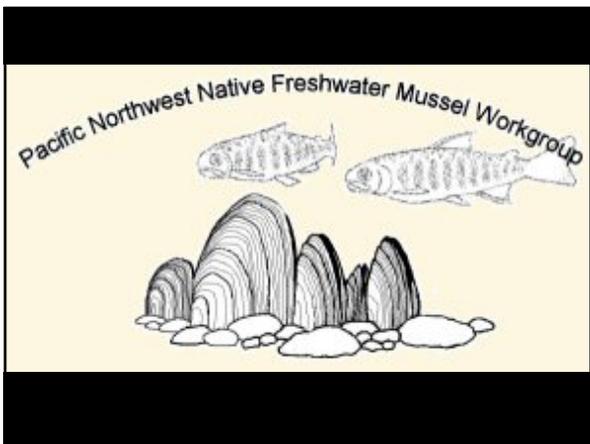
Related Aquatic Assessments

- Dike removal
- Dam or water control structure removal
- Water withdrawal assessments
- Drawdown assessments
- Habitat restoration
- Flood and floodplain assessments
- ANS management



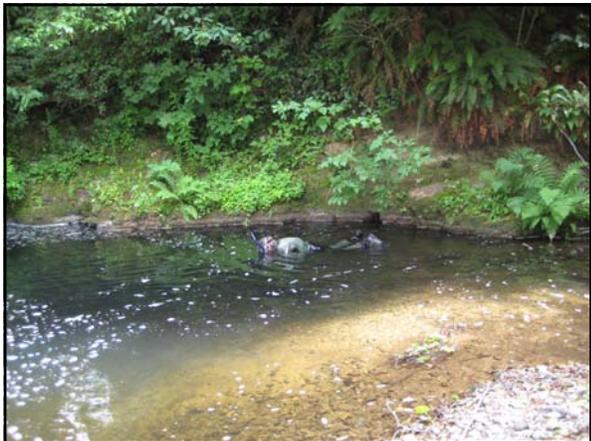
TRANSFER OF A WESTERN
PEARLSHELL MUSSEL POPULATION
TO THE WILLAPA NATIONAL
WILDLIFE REFUGE, WASHINGTON

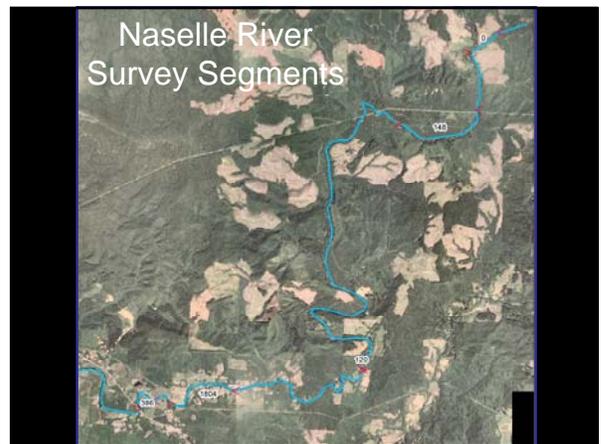
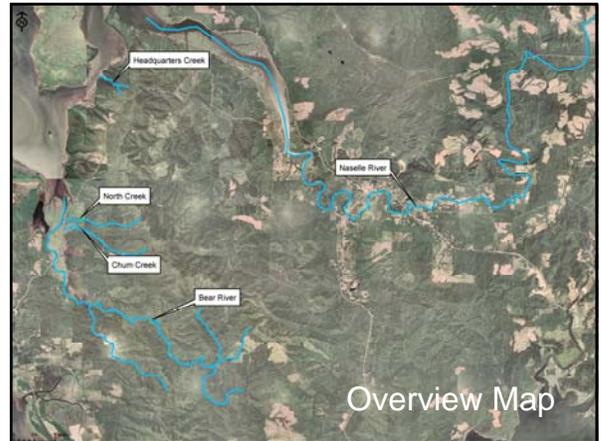


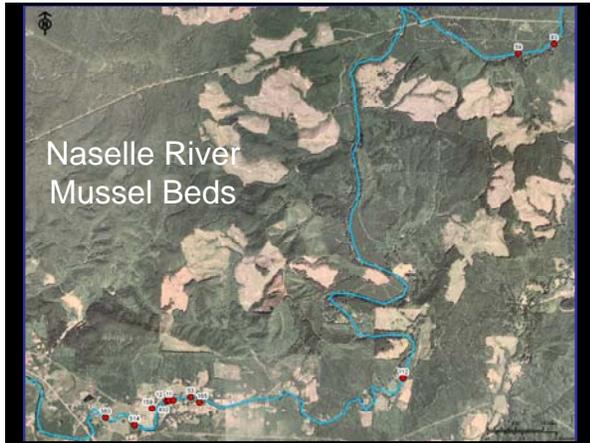












FRESHWATER SHELLFISH TRANSPORT APPLICATION PERMIT
(Please print clearly in black)

To: Freshwater Fisheries Staff - Oregon State Dept. of Fish and Wildlife

1. Type of application: Transfer

2. Name of Applicant: Trinity Phone Number: 503-444-3443

3. Mailing address: 10000 National Wildlife Refuge, 2000 State Street 101, City: Seaside, OR, 97138

4. Species: Mussel Permit Number: 100

Current 603 Day: WAT 2018-124

5. (a) Justification: For purposes of this section, "Wildlife" shall mean and include "fish" as defined in ORS 173.005. This permit is required for the transport of shellfish from one location to another for the purpose of research or for the purpose of stock enhancement. This permit is required for the transport of shellfish from one location to another for the purpose of research or for the purpose of stock enhancement. This permit is required for the transport of shellfish from one location to another for the purpose of research or for the purpose of stock enhancement.

6. (b) Justification: For purposes of this section, "Wildlife" shall mean and include "fish" as defined in ORS 173.005. This permit is required for the transport of shellfish from one location to another for the purpose of research or for the purpose of stock enhancement. This permit is required for the transport of shellfish from one location to another for the purpose of research or for the purpose of stock enhancement.

7. Applicant's Signature: [Signature] Date: 8-2-17

NOTE: A DETAILED TRANSFER PROTOCOL PLAN MUST ACCOMPANY THIS APPLICATION. A SCIENTIFIC COLLECTION PERMIT APPLICATION MUST BE APPROVED. PLEASE ATTACH A COPY OF THE SUBMITTED SCIENTIFIC COLLECTION PERMIT APPLICATION.

INFORMATION BELOW TO BE COMPLETED BY WDFW PERSONNEL

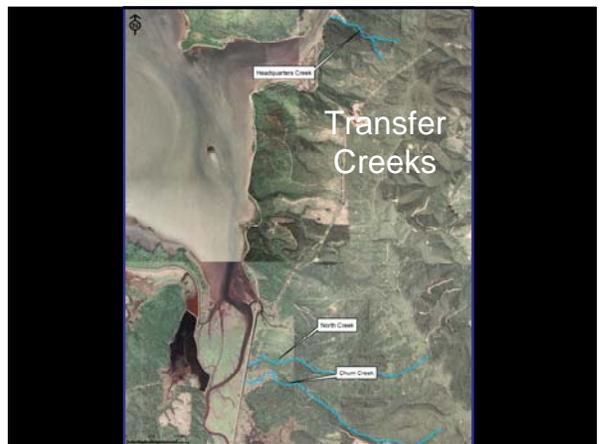
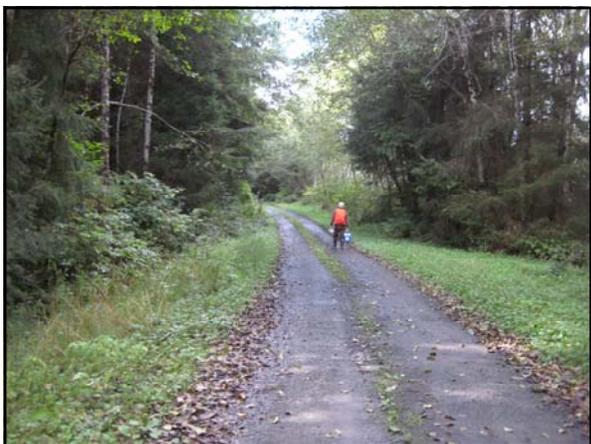
PROCESSED:

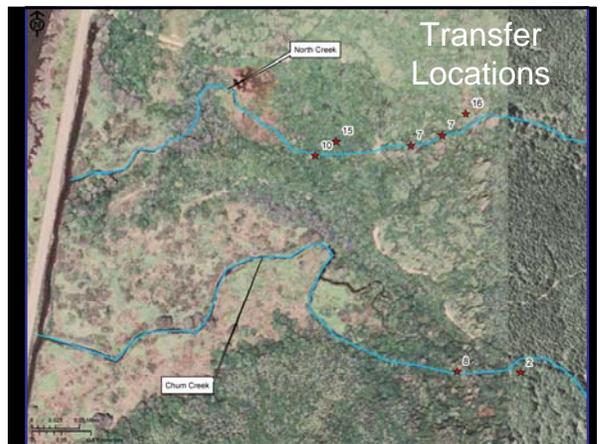
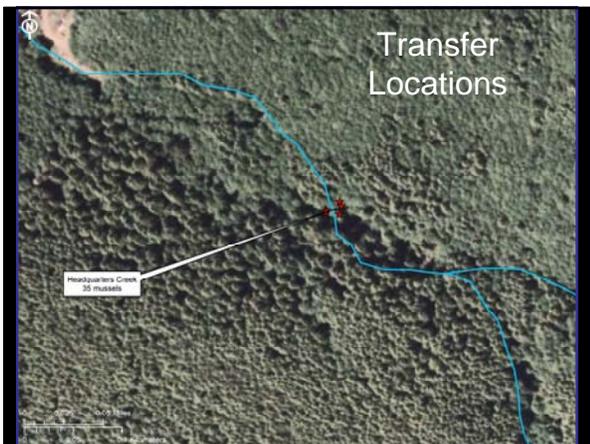
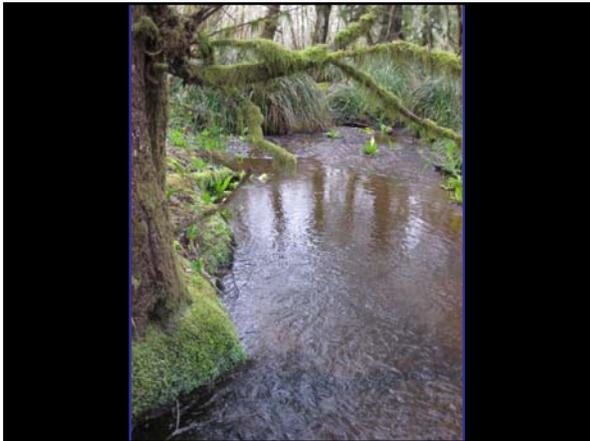
Additional processing dates:

X Approved Not approved Regional Fish Prog. Manager: [Signature] Date: 8/2/17

Approved: [Signature] Date: 8/2/17









Transfer Creek Surveys
Headquarters Creek

Site	10/1/07	10/16	11/7	11/26	12/5	1/18/08	2/11	3/19	3/27	4/11	4/21
1 (Mussels transferred -5)	5	3	5	5	4	2	2	5	3	6 (4+2 below)	6 (4+2 below)
2 (Mussels transferred -10)	8	No survey	9	9	3	3	3	4	5	5	5
3 (Mussels transferred -5)	2	No survey	5	5	4	5	5	6	6	6	6
4 (Mussels transferred -5)	4	1 (dead)	0								
4a (Mussels transferred -0)				3	2	3	3	3	3	4	4
5 (Mussels transferred -10)	10	3	5	7	5	5	5	6	6	6	6

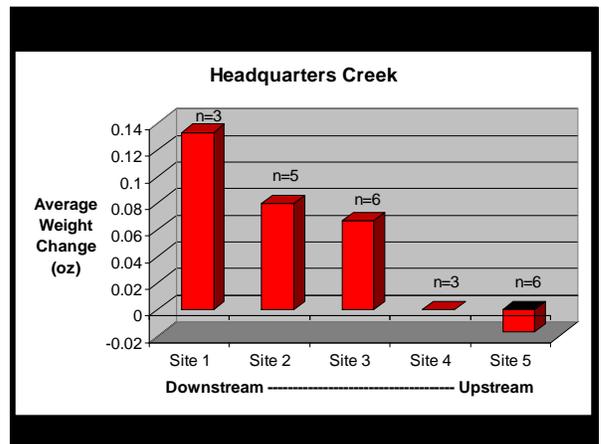
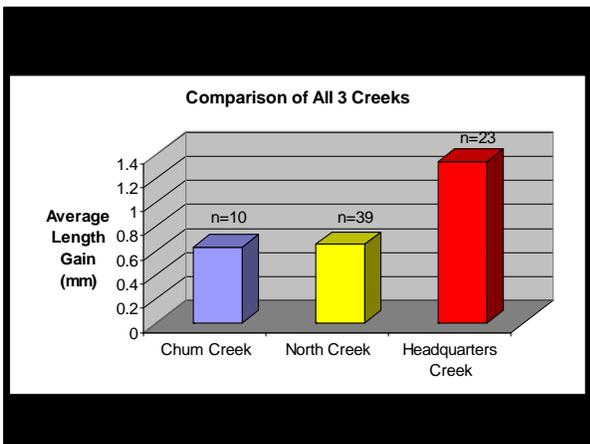
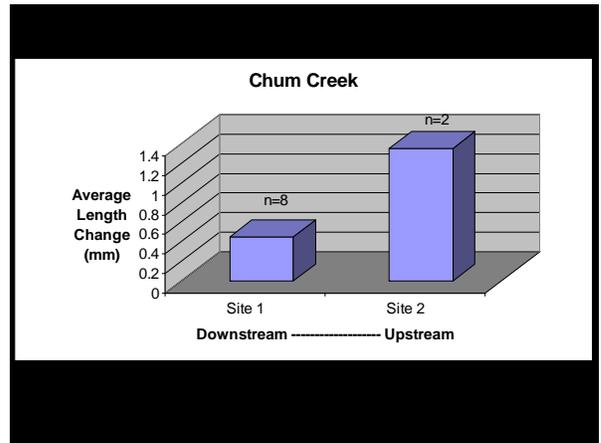
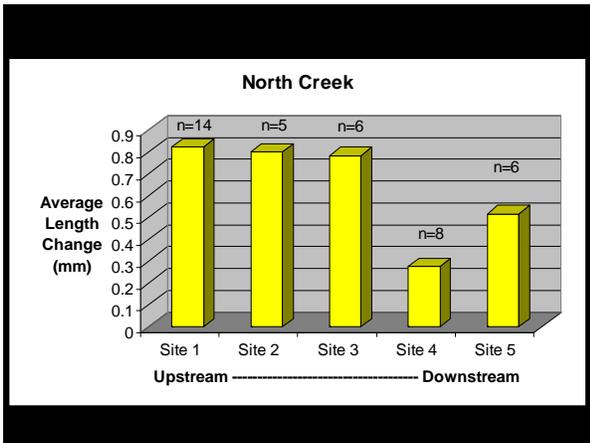
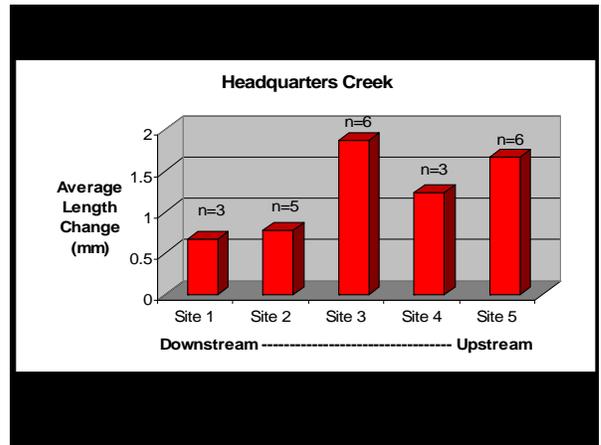
Transfer Creek Surveys
North Creek

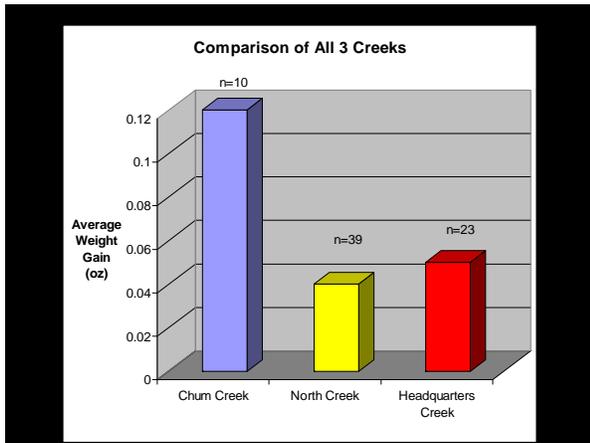
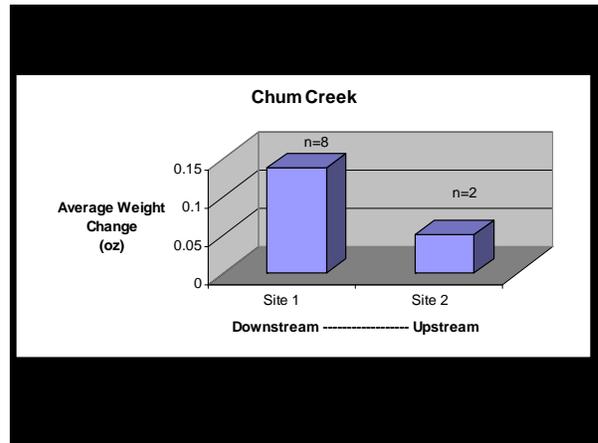
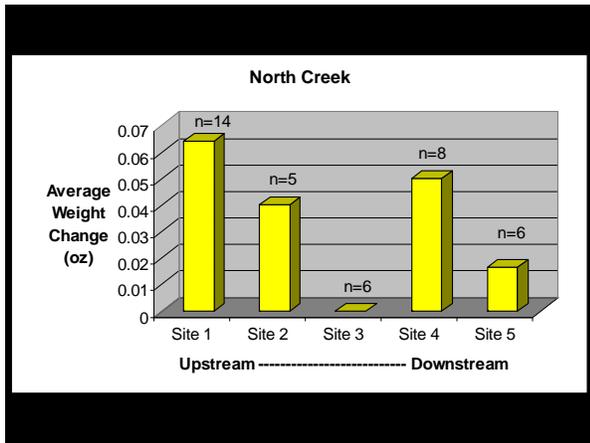
	10/3/07	10/12	10/26	11/13	12/5	1/16/08	1/23	1/24	2/26	3/12	3/20	3/24	4/2	4/24
1 (Mussels transferred -10)	6	9	13	14	12	15	15	No survey	15	14	No survey	13	13	14
2 (Mussels transferred -7)	5	4	4	4	6	5	5	No survey	5	5	No survey	5	5	5
3 (Mussels transferred -7)	4	6	6	6	4	4	5	No survey	7	No survey	6	6	6	6
4 (Mussels transferred -15)	6	12	5	3	9	10	7	7	9	No survey	8	8	8	12
5 (Mussels transferred -10)	2	6	6	7	1	4	6	No survey	7	6	No survey	6	6	7

Transfer Creek Surveys
Chum Creek

Site	10/3/07	10/12	10/26	11/13	11/15	12/5	1/16/08	1/23	2/26	3/12	3/24	4/2	4/24
Downstream site (Mussels transferred - 8)	7	7	6	6	No survey	6	8	8	7	8	8	8	7
Upstream site (Mussels transferred - 2)	2	2	2	2	2	2	2	2	2	2	2	2	2









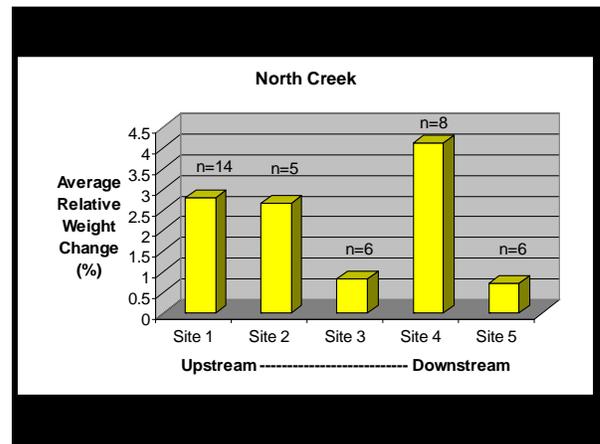
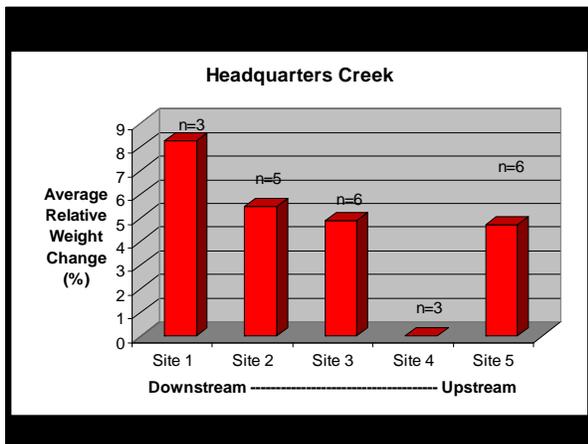
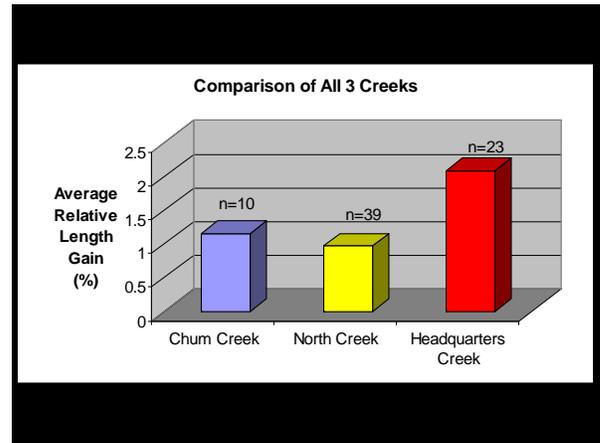
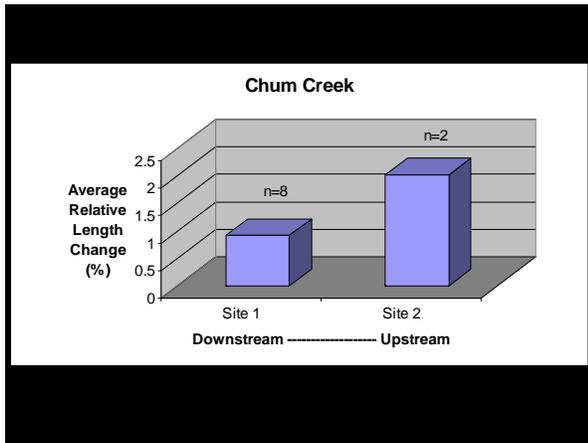
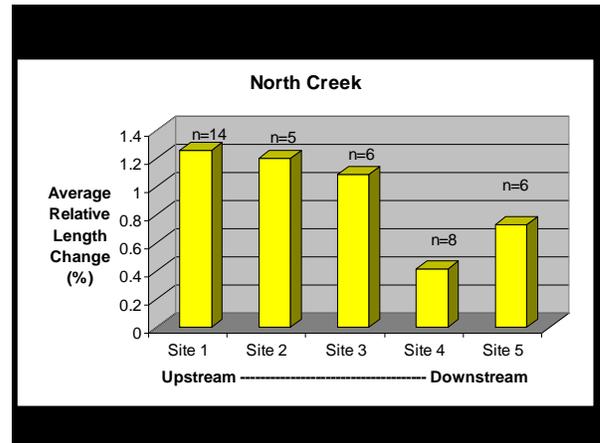
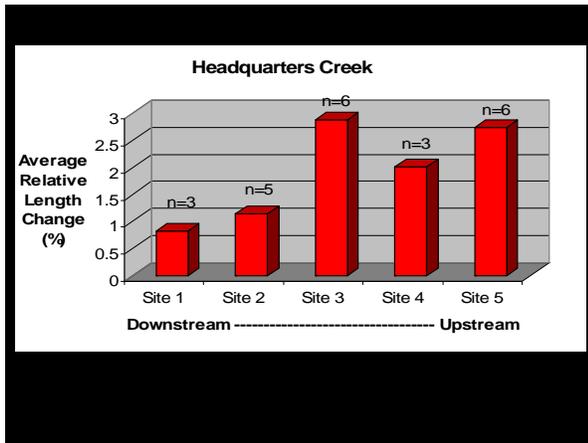
Special thanks to:

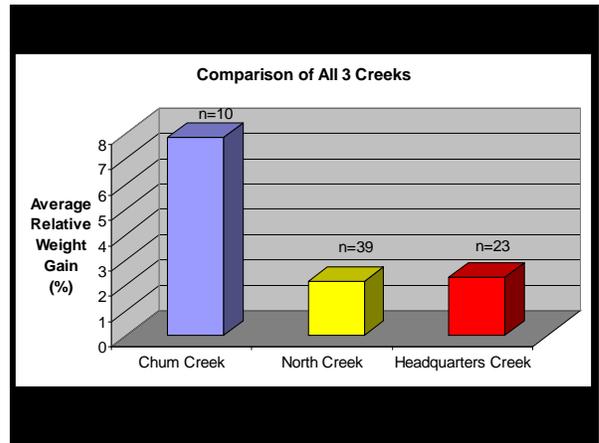
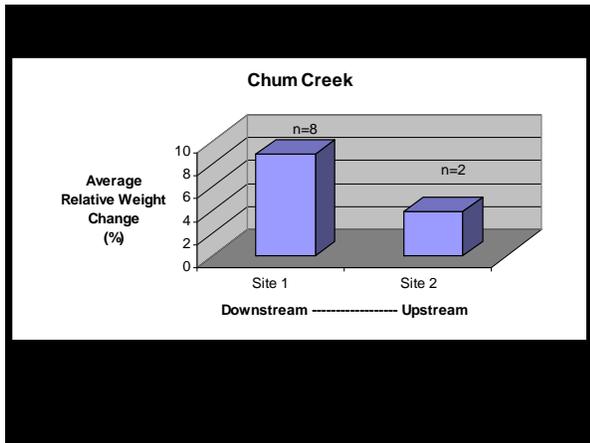
Russ Lewis

Bill Hutton




Kirsten Brennan
Angie Chapman







Tualatin River
NATIONAL WILDLIFE REFUGE
U.S. Fish and Wildlife Service
Department of the Interior



Pete Schmidt
Wildlife Biologist

May 2008

Overview

- Passage Issues
- Operational Issues
- Current & Future Concerns

● Passage Issues





Operational Issues

- Release of fish following flooding
- No release of water after April 30th
- Lift pump vs wells





● **Current & Future Concerns**



Current & Future Concerns

- Rock Creek culvert
- Loss of floodplain function – Raising Scoggins Dam





Water Quality



Water Use Monitoring

Water Resources



Water Rights

Water Resources

Branch Chief: Dar Crammond

- Region 1 Water Resources Branch is a customer service oriented organization that assists Refuges and Hatcheries to acquire, manage and beneficially use water in furtherance of the Service's mission.
- Responsible for water resources of Region 1 and 8 (excluding Central Valley Project and Bay Delta)
- Staff of eight includes hydrologists, geographer, program analyst, hydrologic technician.

Malheur NWR Instream Flow Study



- How did Water Resources get involved in a flow study?
- In 1999, the Service applied to Oregon for a "winter" water right.
- Why?
- Refuge could only legally divert from March 15 to October 1.
- Refuge needed flexibility to divert earlier and later for wet-up, habitat maintenance, flood control.

Malheur NWR Instream Flow Study

- Getting our ducks in a row:
- Right claimed 820 cfs from October 1 to March 1.
- Based on refuge diversion capacity, not available Donner und Blitzen water.
- D&B River mean cfs October thru Feb: 56, 66, 89, 149, 223.
- Widespread panic and legal protest.

Malheur NWR Instream Flow Study

- Service cleared the first hurdle – OWRD water availability – mainly by showing 824 cfs was available 20% of the time, and by virtue of the "public interest."
- Service cleared the second hurdle - negotiated with Water Watch Oregon, Harney County, and ODFW to resolve their objections to the new permit.
- Settlement in 2000 allowed OWRD to issue a permit in April 2004.
- BUT** - - -
- There were conditions that had to be met before the water right would go forward to certificate.

Malheur NWR Instream Flow Study

- Measurement Plan
 - Service will measure all diversions from the Donner und Blitzen and tributaries within the Refuge and OWRD would have to approve of the methods.
 - Done.
 - Have an approved mass-balance/water budget approach that derives net diversions.

Malheur NWR Instream Flow Study

- 2. Water Quality Plan
 - Service will provide a water quality monitoring plan acceptable to the parties and ODEQ.
 - In process.
 - There are no TMDLs on the D&B, so it is difficult to say we are in compliance.
 - ODEQ has indicated that the refuge's current efforts are good – keep up the BMPs.

Malheur NWR Instream Flow Study

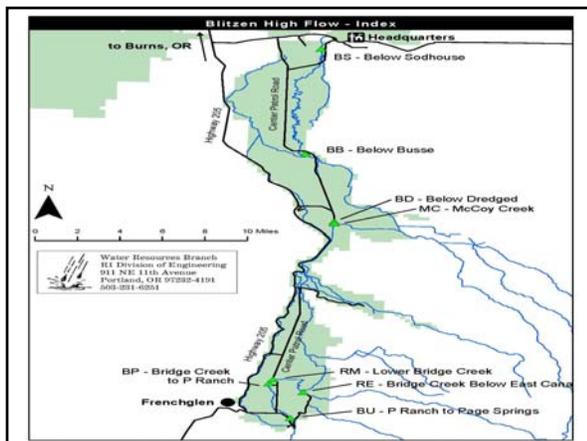
- 3. Fish Passage and Screening
 - Service will provide fish passage and screening at all diversions/dams satisfactory to ODFW.
 - Projected cost is \$8M.
 - Not done.
 - Likely to take several years, if not decades.

Malheur NWR Instream Flow Study

- 4. Redband Trout Flow Study
 - Service will determine, "for the period of the permit," flow necessary to maintain all life stages of the Redband Trout in the D&B and tributaries.
 - Service will determine high flows necessary for geomorphologic processes necessary to maintain all life stages of the Redband Trout.
 - Study to be done with ODFW, to their satisfaction.

Malheur NWR Instream Flow Study

- Default flows were set up in the permit for the interim, based on October 50% exceedance flows – D&B 45 cfs, tribs 5 cfs
- Malheur NWR decided early on that this default minimum and the eventual "study" minimum would apply **ALL YEAR.**
- A much higher bar
 - it would be easy to meet an instream flow target from October to February.



Malheur NWR Instream Flow Study

- Study Design by ODFW: IFIM Methodology
- Habitat suitability and representative 1D PHABSIM transects
- 33 transects
 - 27 on the D&B
 - 5 on Bridge Creek
 - 1 on McCoy Creek
- X-sects surveyed on 8"/6" sections for elevation.
- Velocities on 8"/6" sections, measured at:
 - Low flow - <50 cfs/<15 cfs – all x-sects
 - High Baseflow – 50-150 cfs/ 15-50 cfs – all x-sects
 - High Flow - > 250 cfs – 8 representative x-sects
- Approx 3000 data points.
- At 5 minutes/data point = 250 person hours



Malheur NWR Instream Flow Study

- Elevation survey for all x-sects – done.
- Low flow velocities for all x-sects – done.
- High flow velocities on 8 x-sects –
 - USGS Portland under contract
 - To be done, with Service assistance, Spring 2008
 - Dangerous, exciting, hydrologists love high water.
- High Baseflow – to be done early summer 2008.



Malheur NWR Instream Flow Study

- Problems, Issues:
- Lost our ODFW lead IFIM person. Waiting for a replacement.
- Measuring high baseflows after high flows may have changed transect profiles.
 - Will verify x-sect profiles at selected sites to gage the extent of the geomorphic effect.
- Not enough information on Redband Trout life stages to make a definitive call on flow requirements.
- Others -

Status of 2007 Workshop Action Items and Related Topics

- 12 action items developed from the last workshop
- Items addressed a range of topics
 - e.g., planned activities for ongoing projects, technical assistance, request to meet with ARDs
- Some level of activity on virtually all items
- Many related to 30 active FONS proposals concerning NWRs

Ongoing Projects

- Pierce NWR chum salmon
 - Working on final reports
- Julia Butler Hansen and Lewis & Clark NWRs (tidegate project)
 - Islands: Completed 2nd season of pre-construction monitoring, now into post
 - Mainland: Completed 1st season of pre-construction monitoring, construction may occur in phases



Ongoing Projects



- Nestucca Bay NWR
 - Post-construction monitoring, NFPP funds to replace culvert
- Bandon Marsh NWR
 - Pre-construction monitoring on Fahy Creek

Ongoing Projects

- Hanford Reach NM
 - Continuing work with juvenile stranding
- Malheur NWR
 - Need to complete processing invertebrate samples, expand scope of qualitative analyses relative to literature



Fisheries Assistance



- CCP development
 - Julia Butler Hansen, Lewis & Clark, Ridgefield, Willamette, Sheldon
- Technical support
 - Gee Creek surveys and watershed group, Tualatin permits and DEIS
- Projects to complete
 - Malheur habitat project report, JBH Nelson Creek assessment

Ecological Services, Fisheries, Refuges— Regional and field offices meeting

- Goal—Improve Fisheries ability to support activities of Refuges and other programs by providing planning, design, and monitoring and evaluation for habitat management.
- Objectives—Discussion concerning three topics:
 - Priorities of the programs relative to components of habitat management and restoration projects,
 - Dedication of fisheries resources for planning, project selection, and M&E components of habitat projects (i.e., supportive of Strategic Habitat Conservation), and
 - Ability to share credit among programs in reporting habitat management and restoration accomplishments.

Background

- CRFPO has history of working with NWRs
- Workshops to further working relationships
- NWR major needs are planning and M&E
- ES has similar needs (e.g., partners, coastal program)
- Insufficient resources are a hindrance



Example of Strategic/Effective M&E project (local and broad scales)



- Where—Tenasillahe Island at Julia Butler Hansen NWR
- What—Evaluate habitats and juvenile salmon use of sloughs for replacing tidegates compatible with habitat management for Columbian white-tailed deer
- Results—Characterized pre-construction conditions, documented salmon use and estimated residence time for comparison with post-construction conditions
- Broad scale—Address entire lower Columbia River Focal area including NWRs and other ownerships

Example of Challenging M&E project (local and broad scales)



- Where—Donner und Blitzen River at Malheur NWR
- What—Evaluate effects of rock weir and root wad placement in river reach on redband trout, aquatic invertebrates, and habitat
- Results—Conducted pre- and post-construction surveys, resources and approach insufficient to fully meet objectives resulting in limited confidence in applying habitat approach outside of study reach
- Broad scale—Two NWR-CRFPO workshops based on who has time to attend and opportunities for funding aquatic resource needs

Issues

- Planning and M&E components of habitat projects, to which Fisheries can contribute, are not emphasized or receive resources to the extent as the construction component
- These components are essential for transparent accountability in project planning, selection, assessment, and evaluating clearly identified habitat and population objectives
- Dedicating resources to assist in these components would improve efficiency and accountability
- Sharing credit among programs would improve cross-program efforts

Importance of M&E to Habitat Projects and FWS Strategic Vision and Direction



- For projects:
 - Improves understanding
 - Project performance
 - Evaluate and adapt projects and programs
 - Accountability and efficiency
- For FWS:
 - Supports elements of
 - Fulfilling the Promise 1999
 - R1 Fisheries Strategic Plan 2004
 - Shaping Our Future 2006
 - Strategic Habitat Conservation 2006
 - Adaptive Management 2007

What is Strategic Habitat Conservation ?

An iterative, 4-step adaptive framework to achieve conservation goals (Can be considered a specific application of adaptive management, payoff is gradual improvement in management through time)

- Biological Planning
 - Priorities and measurable population objectives
- Conservation Design
 - What type of habitat, how much, and where
- Implementation
 - Take action, program response
- Monitoring & Research
 - Tie monitoring & research to management



Example: Potential Application for Bandon Marsh NWR Habitat Restoration Project

- Background: Tidal marsh restoration (~400 acres) that involves multiple partners planned for 2009
- Request to CRFPO:
 - Restoration design assistance
 - Pre- and post-construction monitoring
 - Evaluation of project performance
- Potential M&E approach: BACI design focused on
 - Habitat capacity
 - Habitat opportunity
 - Realized function



Opportunities and Bottlenecks for Bandon Marsh NWR example



- Opportunity to
 - Generate information that contributes to biological and conservation planning
 - Implement M&E to assess restoration project
 - Implement SHC in cross program manner
- Bottlenecks include insufficient resources to fully engage FWS programs in implementing all appropriate components of SHC

Proposed Solutions: Program Priorities



- Integration of priorities common among FWS programs
- View priorities at multiple spatial scales (e.g., local—NWR project, broad—focal area, regional)
- Cross-program group develops and implements projects to demonstrate application of SHC

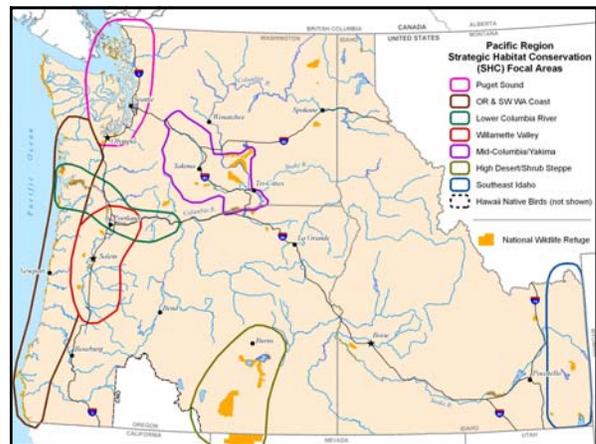
Proposed Solutions: Resources for M&E

- At least two categories of monitoring, inventory and effectiveness
- Both inventory and effectiveness monitoring contribute to SHC and other adaptive frameworks
- Dedicate resources specifically targeting M&E (e.g., derived from discretionary, year end, redirected, or cost share sources)



Proposed Solutions: Reporting Credit Among Programs

- Reporting requirements should not inhibit cross-program efforts
- Sensitivity and flexibility are needed to encourage efforts and advance coordination
- Regional coordination and guidance necessary for effective cross-program efforts



Stages of SHC Implementation

1. Population objectives
 2. ID limiting factors
 3. Landscape population-habitat models
 4. Decision support tools
 5. Assess state of species
 6. ID priority areas
 7. Habitat objectives
 8. Deliver conservation actions
 9. Monitor effects
 10. Assess progress on population objectives
 11. Assess program accomplishments
-

Status of SHC Implementation for Coastal Cutthroat Trout in Lower Columbia River

1. Population objectives needed
 2. Limiting factors generally described
 3. Landscape population-habitat models needed
 4. Decision support tools needed
 5. State of species variously described
 6. Priority areas not ID
 7. Quantitative habitat objectives needed
 8. Several conservation actions implemented
 9. Effects of actions rarely monitored
 10. Population objectives needed to assess
 11. Implementation/habitat-based accomplishments
-

Suggested Steps for Coastal Cutthroat Trout

- Coordinate with cutthroat trout conservation initiative (priorities-improve understanding of life history mechanisms and develop monitoring strategy, PSFMC range-wide data base)
- Form and use advice from science advisory team
- Generate spatially explicit biological and physical data
- Develop species-habitat models and decision support tools
- Implement conservation actions
- Monitor to assess effectiveness of actions and contribute data to adaptive management

Coastal Cutthroat Trout in Lower Columbia River



Coastal Cutthroat Trout in Lower Columbia River (location of refuges)



Coastal Cutthroat Trout in Lower Columbia River (location of refuges and partners projects)

