

# **NWR-CRFPO Workshop Report**

## **Appendices**

## APPENDIX A

### NWR-FISHERIES WORKSHOP AGENDA

July 20, 2005

Columbia River Fisheries Program Office

1211 SE Cardinal Court, Suite 100

Vancouver, WA 98683

Goal: Provide a forum to promote effective information exchange between NWRs and the Columbia River Fisheries Program Office.

#### Objectives:

1. Inform CRFPO about NWRs and their aquatic resource issues and needs.
2. Inform NWRs about fisheries expertise at CRFPO and results of ongoing work.
3. Explore possibilities for cooperative efforts between NWRs and CRFPO.
4. Identify potential areas for demonstration projects for watershed restoration.
5. Develop workshop document with action items.

#### Geographic Scope:

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

1. 8:00-8:10 Welcome and overview of workshop (Lohr)
  2. Overview of each NWR with specific information on aquatic resource issues and needs (see handouts of NWR templates)
- 8:10-8:30 Willapa NWR Complex (Willapa NWR, Julia Butler Hansen NWR, Lewis and Clark NWR)
- 8:30-8:50 Ridgefield NWR Complex (Ridgefield NWR, Pierce NWR, Franz Lake NWR, Steigerwald NWR, Conboy NWR)
- 8:50-9:10 Mid-Columbia NWR (Umatilla NWR, Cold Springs NWR, McKay NWR)
- 9:10-9:30 Oregon Coast NWR Complex (Cape Meares NWR, Bandon Marsh NWR, Siletz Bay NWR, Oregon Islands NWR, Nestucca Bay NWR, Three Arch Rocks NWR)
- 9:30-9:50 Tualatin River NWR (Tualatin NWR, Wapato Lake NWR)
- 9:50-10:10 Break
- 10:10-10:30 Willamette Valley NWR Complex (Ankeny NWR, Baskett Slough NWR, Finley NWR)

- 10:30-10:50 Malheur NWR
- 10:50-11:10 Sheldon-Hart Mountain NWR Complex (Sheldon NWR, Hart Mountain Antelope Range)
3. 11:10-11:30 CRFPO: Technical capabilities and refuge work (Schaller)
4. Ongoing work on refuges
- 11:30-11:45 Survey of refuge culverts by WWO Fisheries (Wunderlich)
- 11:45-12:45 Lunch at CRFPO
- 12:45-1:00 Franz Lake NWR: fish use and distribution (Lohr)
- 1:00-1:15 Pierce NWR: chum salmon project (Poirier)
- 1:15-1:30 Malheur NWR: Blitzen River fish and habitat surveys (Hudson)
- 1:30-1:45 Julia Butler Hansen-Lewis and Clark NWRs: fish use and habitat in sloughs (Whitesel)
- 1:45-2:00 Work outside of geographic scope: instream flow studies at Hanford Reach NM (Anglin)
5. 2:00-2:30 Discussion of regional programs and involvement that promote opportunities for fisheries assistance to NWRs
- Cross Program Recovery (Finn)  
National Fish Habitat Initiative (Bagdovitz)  
Joint Venture (Smith)  
Science Support/Invasive Species (Heimowitz)
- 2:30-2:50 Break
6. 2:50-5:00 Facilitated discussion
- Identification of NWRs aquatic resource needs corresponding to CRFPO capabilities
- Identification of potential opportunities for demonstration projects for watershed restoration associated with NWRs
- Identification of contacts (NWR, CRFPO, RO) responsible for developing project proposals for RONS, FONS, internal and external funding sources

## 7. Wrap up

## APPENDIX B

### Workshop Attendees

Donna Allard	CRFPO
Brian Allen	Umatilla NWR
Don Anglin	CRFPO
Mark Bagdovitz	RO Fisheries
Jock Beall	Willamette Valley NWR Complex
Howard Browers	Toppenish NWR
Forrest Cameron	RO Refuges
Jim Clapp	Columbia River Gorge NWRs
Tim Cummings	CRFPO
Doug Dehart	RO Fisheries
Joe Engler	Ridgefield NWR
Vicki Finn	RO Fisheries
Gary Hagedorn	Mid-Columbia NWR Complex
Russ Harmon	RO Fisheries-Refuges
Paul Heimowitz	RO Fisheries
Amy Horstman	OFWO
Michael Hudson	CRFPO
David Johnson	Sheldon-Hart Mountain NWR Complex
Jeff Johnson	CRFPO
Rich Johnson	RO Fisheries
Sam Lohr	CRFPO
Roy Lowe	Oregon Coast NWR Complex
Tom Melanson	RO Refuges
Sharon Miller	CRFPO
Fred Paveglio	RO Refuges
Jennifer Poirier	CRFPO
Howard Schaller	CRFPO
Peter Schmidt	Tualatin River NWR
Joe Skalicky	CRFPO
Carey Smith	Joint Venture
Doug Spencer	Willamette Valley NWR Complex
Charlie Stenvall	Willapa NWR Complex
Donna Stovall	Malheur NWR
Jean Takekawa	Nisqually NWR Complex
Jerry Van Meter	RO Fisheries
Danielle Warner	CRFPO
Ralph Webber	Tualatin River NWR
Tim Whitesel	CRFPO
Bob Wunderlich	WWFOW Fisheries Division
Marv Yoshinaka	CRFPO

## APPENDIX C

### NWR-FISHERIES WORKSHOP NOTES

July 20, 2005

Columbia River Fisheries Program Office

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Vancouver, WA 98683

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5. Develop workshop document with action items.

#### Geographic Scope:

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

1. 8:00-8:10 Welcome and overview of workshop (Lohr)

Sam Lohr welcomed everyone and reiterated the goal and objectives. He said there was interest to have the workshop within our geographic area and perhaps it will be an annual event. The Service may also want to do elsewhere in the region. Tim Cummings will facilitate discussion. Sam provided a handout that is his attempt to summarize specific needs. He expressed appreciation for responses received to the template he provided.

2. Overview of each NWR with specific information on aquatic resource issues and needs (see handouts of NWR templates)

8:10-8:30 Willapa NWR Complex (Willapa NWR, Julia Butler Hansen NWR, Lewis and Clark NWR) – Charlie Stenvall - slideshow

Willapa NWRC staff have worked with CRFPO for the past five years; CRFPO has provided science to allow work on fisheries.

At Lewis & Clark, pristine habitat, issues are: 1) dredge spoils by COE channel deepening; and 2) colonial nesting birds (impacts on anadromous fish).

At Julia Butler Hansen NWR (CWT deer), which is diked, issues include 1) replace failing tidegate(s) with fish friendly; 2) intertidal habitat; and 3) Crims Island, intertidal marsh-stream/slough habitat for salmonids within dikes.

At Willapa, 19 streams have salmonid issues: 1) worked with CRFPO on sediment dam out–woody debris in; 2) 300-acre project, agriculture, with cut-throat trout, and tidegate structures are failing. As result of a report from CRFPO, installed ladders; 3) through work with Marv Yoshinaka, installed a fish passage culvert/40 ft. bridge; 4) quarry off-refuge sediment input; 5) blocked culvert, Campbell group, upstream habitat on small streams–tidal restoration. 6) need money to bridge highway and reconnect streams; 7) woody debris; 8) direct reintroduction of cut-throat trout; 9) seeded trays, when hatched free to go; 10) brook lamprey, even anadromous, how do you reintroduce; 11) freshwater mussel species-what used to be there, how do you reintroduce; 12) interest in snails, forest bats. Needs not only restoration project(s), but also limiting factor information. Willapa NWRC has more questions and needs help (co-location?). Tim Whitesel asked how species and locations are chosen for reintroduction. Charlie responded they have basically worked with the State.

8:30-8:50 Ridgefield NWR Complex (Ridgefield NWR, Pierce NWR, Franz Lake NWR, Steigerwald NWR, Conboy NWR)

Joe Engler said Ridgefield NWR is 5,000 acres, the River S unit is diked and intensively managed for Canadian geese. There is tidal influence on the Carty Unit. Carty Unit includes Gee Creek, with cutthroat trout. CRFPO has a cut-throat trout project at Ridgefield. There was a run of coho in the olden days and there is interest in restoring. Ridgefield has limited information for anadromous fish. Gee Creek is suitable for restoration for spawning habitat but not rearing or breeding. Information is needed on the health of Carty Unit in terms of passage issues. Ridgefield needs from CRFPO: 1) direction on Gee Creek (worth restoring for anadromous fish or cut-throat); 2) Post Office Lake is blocked from the Columbia-rearing habitat only; 3) need a lot of help from CRFPO to plan for fisheries issues/projects within multi-year Comprehensive Conservation Plan (CCP) at Ridgefield; 4) same issues for mosquito control at Ridgefield as at Franz Lake; 5) need answers on resident or migratory populations; 6) questions about mussels/mollusks (zebra mussels, new Zealand mud snails- invasive species).

Jim Clapp is manages 3 small refuges (Steigerwald, Franz Lake, Pierce) between Washougal and Beacon Rock He the only staff person at the Gorge refuges. A CCP is finished for these refuges.

Jim described a channel for which responsibility for tidegate maintenance is/was an issue. A problem identified in the CCP is sediment from the 96 flood fills up areas. Sedimentation from upstream reduces carrying capacity. Floods occur more frequently. The Corps biologist recommended cutting through the Columbia River flood control dike and reconnecting Gibbons Creek. There was money to do a conceptual plan but about a year ago, funds were no longer available. How do we go from here? Jim has talked to Ducks Unlimited on the initial stage and they are interested, but there is no money as yet. Jim needs the fisheries office to support and provide information as the project is planned at Steigerwald. All three refuges need a Fisheries Management Plan now that the CCP is done. Three issues for all three refuges: 1) upstream fish blockage–railroad or SR 14 -

fish friendly culverts; 2) fish blockage, sedimentation, lack of woody debris, vegetation; 3) Franz Lake, Service indicated was used by salmon about 5 years ago. Mosquito problem, push to use BTI would affect more than mosquitos. Two studies were funded: a) CRFPO fish use and distribution; and b) University of Washington research on invertebrate populations in control and non-control areas (final report pending).

Pierce NWR has a remnant chum salmon population in Hardy Creek. The Bonneville Power Administration, Fish and Wildlife Service, and/or Washington Department of Fish and Wildlife has information for the last 5-7 years. There has been research only, no construction projects.

Sam Lohr asked if there is opportunity to look at watershed restoration on Gibbons or Gee Creek. Joe said a watershed coordinator will be hired for approximately one year to come up with funding for projects on and off refuges. Will do for Gee Creek; there is local interest for Gibbons Creek but no coordinator.

8:50-9:10 Mid-Columbia NWR (Umatilla NWR, Cold Springs NWR, McKay NWR)

Brian Allen said the (slide) presentation would include Umatilla and Toppenish but not Cold Springs and McKay as they are mostly reservoirs. Umatilla NWR was created as a result of John Day Dam mitigation for waterfowl habitat. There was a hydrological change (the mouth of the slough was closed off away from the river) in McCormick Slough through creation of the John Day pool and 1/3 wetland acres were lost. This occurs too on backwaters of the refuge and impacts the hunt program. There is also cottonwood tree mortality. There is a slough restoration program, and it was decided best not to connect to the river. The Refuge is looking at Paterson Slough for riparian restoration. They are looking for help with impacts to salmon or possible benefit for salmon. There is potential to connect Paterson Slough with the river.

Toppenish – Howard Browers said Toppenish NWR was created in 1964 with duck stamp money. He described a PIT tagging project monitoring steelhead movements on Toppenish, south Umatilla, Snake Creek. Steelhead use the refuge as migration corridor. Can divert water to wetlands – all unscreened

Water can be diverted to wetlands – all unscreened; there is FRIMA money to install fish screens in 3 locations.

Vicki asked a basic questions about who does the fish management plan in the CCP. How much is in the CCP versus the fish management plan. Fisheries has been involved; the fish management plan is basically a step down plan from the CCP.

9:10-9:30 Oregon Coast NWR Complex (Cape Meares NWR, Bandon Marsh NWR, Siletz Bay NWR, Oregon Islands NWR, Nestucca Bay NWR, Three Arch Rocks NWR)



Roy Lowe said a summary would be that there is very little information. There are no basic inventories or assessments. On Siletz Bay, two restoration projects are complete, two are planned. The Service has been doing fisheries work with the Siletz Tribe. The Tribe monitors with an underwater camera and video records fish species. Large wood has increased use.

Nestucca Bay NWR is managed for Dusky Canada geese and all 6-7 subspecies are present. The tidegate(s) is/are fish friendly and lots of juvenile coho use has been found. Little bits of marsh indicate use by coho, Chinook, cutthroat trout—not steelhead. The state and NOAA-Fisheries monitor anadromous fish use. Restoration of 88 acres will occur next summer and include work with ODOT for culvert(s). Fish are using the areas.

Neskowin Marsh includes three type of bogs - still learning about marsh.

Bandon Marsh NWR Indian name: Nylestin, “small fish dam” trap fish using natural weirs. Getting in line to do restoration in '07 or '08. two tidegates. Coho fry near cranberry bog are spawning in sand. Work in the area is complicated by cultural resources. Ground penetrating radar is/will be used. Approximately 5 million dollars will be spent. FWS has been working with the tribe(s) but can use more assistance. Fisheries resources are not basically well managed.

On eastern southern Oregon coast the Service wants to establish a new refuge. There are several creeks and valuable fishery resources. Riparian habitat valuable for small watersheds—fish “boil” out of creek.

Oregon Coast NWRC needs: 1) current assistance is from tribes. Need pre-construction and post-construction monitoring; monthly(?) inventories. Watershed councils are involved above tide, not estuarine areas.

9:30-9:50 Willamette Valley NWR Complex (Ankeny NWR, Baskett Slough NWR, Finley NWR) (Change from agenda)

Doug Spencer said Willamette Valley refuges are managed for dusky Canada geese; fisheries has come later. At Baskett Slough NWR there is very little marsh. It was agriculture when we acquired. We have been doing restoration on Baskett Butte. At Ankeny quite a few wetlands are established. It is one of the units that had salmonids, steelhead. Finley has wetland units. Main creek is Muddy Creek which connects to the Willamette. At Ankeny and Finley, the fisheries issue is Oregon chub. Issue on template that we asked for help. Doug brought a publication, “Challenge of Change”, a condensed version of the Willamette Atlas.

Issue in Whitney Ditch and Ankeny is fish screens on chub ponds and drum. Consulted with ODFW and the drum had to be pulled out to help salmonids keep going upstream.

Off-refuge activities include a Memorandum of Understanding with NRCS (Dept. of Agriculture) on wetland research projects within the valley. There is currently \$900,000

available, within two years there will be 2 million dollars more. Planning strategy-opportunity to get on private lands; could have Oregon chub potential. NWRC is also involved in the Partners Program for upland type work. Finley and Baskett Slough are on headwaters away from the Willamette River. Ankeny could have more fisheries issues. There are about 300,000 visitors and opportunity to do a lot of I&E. We asked for help with genetics. CCP will start in 2007. We will operate within the plan to get FONS, RONS. Have worked with Vicki on Cross Program Recovery, which brings programs together to work on T&E or candidate species (almost like an ecosystem team). Sam Lohr asked about sign up for the NCRS private lands program. – sign up? Converting farmlands to wetlands, some upland. Landowners sign up, it is our decision if we want to take on WRP (wetland restoration project(?)). In 2006, there will be 10 WRPs. The Department of Agriculture has money but no staff.

9:50-10:10 Break

10:10-10:30 Tualatin River NWR (Tualatin NWR, Wapato Lake NWR) (change from agenda)

Ralph Webber described the Tualatin River NWR and project with preferred alternative (Gaston–Wapato Lake). The refuge is at the base of the coast range. Tualatin had the largest flood plain in the Willamette Valley. There has been about 25 years work in Tualatin. Historically, we knew we had anadromous fish, but we do not have good information about fisheries statistically. Tualatin has two main streams and Wapato has four systems. It is a dynamic flood plain that has been altered. Reservoir has control of hydrology of Tualatin River (Scoggins Dam/ Haag Lake). The area is heavily populated (Hillsboro, Beaverton) and there is a proposal to raise the dam another 40 feet. Water used by municipalities. The system is dependent on seasonal flooding. Major project going on; Tualatin River major acquisition program (about half complete); restoration of plant communities. In bigger Tualatin will serve role of I&E and send message of watershed health and function. There's a lot of information with fisheries that we don't have for anadromous fish and steelhead.

Upper Willamette River spring Chinook salmon, steelhead, Pacific lamprey-restoration with primary focus on migratory birds but want to include fisheries. Only information that it is probably most biologically diverse fisheries but few are native. We know we have very high water temperatures when release is occurring. We know we have entrapment occurring. We are trying to incorporate fish passage in restoration projects. Fish ladders, fish screens, water rights based on Tualatin River requiring lift systems (screened). Don't have a handle for best time of drawdown. Areas if not managed go to reed canarygrass. CCP 2010 must have fisheries people at table. (dewater by end of April?)

10:30-10:50 Malheur NWR

Donna Stovall relayed that carp were introduced to Malheur, a closed system/basin in the 1920s. By the 1940s carp were causing a decline in habitat and were controlled with

rotenone. As carp increase, the duck population decreases. Malheur will produce a T-Shirt "Carp Suck", which is biologically accurate. Carp prevent vegetation and compete for food. Malheur used to be a jewel of the refuge system but not now because of carp. Control has included dynamite. The current approach includes: ladder(s); screens for redband to prevent loss of redbands and prevent carp colonization of wetlands; 3-5 year rotation of drawdowns. Malheur needs an integrated pest management plan. Invasive species is not only fish but also migratory bird issue. A project starting this fall is to put in a major screen to prevent large carp from entering Mud Lake; when it dries small carp will be killed. Donna mentioned that funding is for redband, not carp removal.

10:50-11:10 Sheldon-Hart Mountain NWR Complex (Sheldon NWR, Hart Mountain Antelope Range)

Dave Johnson noted that Sheldon is in Nevada but not part of CNO. He said Sheldon-Hart Mountain NWR is 750,000 acres, a closed basin, and anadromous fish habitat is non-existent. There are concerns on both refuges. There has been no thorough genetic look at species in six creeks on Hart Mt. Most fish management is done by ODFW; rainbow trout were introduced. Refuge would like to do a genetic study.

There are 200 miles of streams on Sheldon and it has a strain of Lahonton cutthroat trout. There are 13 different impoundments, siltation, and mostly warm water species. Refuge needs help working with NDOW on reintroducing fish and snails. The big issue on Sheldon is horse removal; woody, riparian habitat is devastated. Refuge will do CCP next year and has requested a fisheries biologist on that team.

3. 11:10-11:30 CRFPO: Technical capabilities and refuge work (Schaller)

Howard Schaller said the Columbia River Fisheries Program Office is not a typical Fisheries Resource Office. It also has responsibility for Service representation in management councils and forums. The FRO office was established in 1973; we have FRO activities and also retained Office of Columbia River Coordinator activities for large scale regional management forums and planning when the two offices combined in 1995. CRFPO is guided by the Pacific Region Fisheries Program Strategic Plan Vision. Howard reviewed the CRFPO organizational structure including an overview of each team's capabilities and skills applied to projects. See handout: Overview of the Columbia River Fisheries Program Office.

4. Ongoing work on refuges

11:30-11:45 Survey of refuge culverts by WWO Fisheries (Wunderlich)

Bob Wunderlich said the Western Washington Fish and Wildlife Office includes approximately 15 staff in fisheries and 80 in Ecological Services. The fisheries staff does work similar to CRFPO (4Hs). He described a culvert inventory on FWS lands that was funded under a 2002 FONS. It is a Boldt decision followup, called Boldt phase 2. Survey was done using standard methodology and covered NWRs and NFHs in WWFO area of

geographic responsibility. A report has been prepared and a copy can be provided. It was then proposed to extend the work to southwest Washington refuges and NFHs. Staff on board got through the inventories but a report is not yet done. A draft should be finished and ready for review at fiscal yearend. Regarding fish-bearing streams, Willapa had quite a few road-stream intersection problems. Charlie Stenvall asked if funding for fish passage on federal lands will be available to refuges. Jerry Van Meter said funding can be accomplished only by having one of the FROs submit through the FONS process. Vicki has about partners, not only Ducks Unlimited but also Washington Trout, Oregon Trout, Trout Unlimited. Jerry Van Meter asked what percentage of CRFPO budget is hard vs. soft money. A purpose of today's meeting is to get list of top priorities, then possibly identify FONS/RONS.

11:45-12:45 Lunch at CRFPO

12:45-1:00 Franz Lake NWR: fish use and distribution (Lohr)

Sam Lohr spoke about the Franz Lake study. Skamania County requested permission to monitor and control the south shore of Franz Lake (for mosquito control). An invertebrate study by Washington coop unit and a CRFPO study on fish species, distribution, and diets were funded. Sam said Indian Mary Creek is spawning habitat with fairly cold water. There is a network of Beaver dams and concern they are causing fish barriers. Sampling methods include baited trap, hoop nets, and boat electro-fishing. Data has been collected from August 03 to June 05. Slide information was presented that show distribution at the mouth, channel, spring, Indian Mary Creek, north, and south shore. Indian Mary Creek has cutthroat trout, juvenile or 300mm or more. The stomach contents have been empty. A final report will be done after wrap up in September.

1:00-1:15 Pierce NWR: chum salmon project (Poirier)

Jennifer Poirier reported on a chum salmon project on Pierce NWR and Hardy Creek to gain information on stock status. Chum salmon abundance is severely declined. The current run is about 3% of historical and chum were listed as threatened in 1999. Hardy Creek is designated critical habitat. Monitoring of the lower 1 mile continues. The current project objective is to examine factors affecting chum.

1:15-1:30 Malheur NWR: Blitzen River fish and habitat surveys (Hudson)

Mike Hudson said the project coincides with a refuge project putting in a series of habitat improvement structures and includes monitoring prior to and post construction. Another is planned for this fall. Structures are a series of rock weir, root wads to provide stabilization and fish habitat.

1:30-1:45 Julia Butler Hansen-Lewis and Clark NWRs: fish use and habitat in sloughs (Whitesel)

Tim Whitesel spoke of collaboration between refuges, CRFPO, and COE on the COE Lower Columbia River Environmental Restoration Program, Columbia River Channel Improvement Project, and tidegate structure(s). This study will try to contrast Tenasillahe and Welch islands because one is diked and heavily managed while the other is not. There is COE interest on fall Chinook and potential for three phases to the project.

1:45-2:00 Work outside of geographic scope: instream flow studies at Hanford Reach NM (Anglin)

Don Anglin described technologies used by the CRFPO Water Management Team.

5. 2:00-2:30 Discussion of regional programs and involvement that promote opportunities for fisheries assistance to NWRs

Cross Program Recovery (Finn)

Vicki Finn provided handouts describing Cross Program Recovery Efforts and CPR for Species. She said the key is to focus on recovery for endangered species that could be achieved in the near future. All FWS programs work together by looking at recovery plans. She described focal species (tier 1) and habitat focus. The NCRS model (described in Willamette Valley NWRC presentation) encourages willing private landowners to restore.

National Fish Habitat Initiative (Bagdovitz)

Mark Bagdovitz described the national level strategic plan. The national fish habitat plan is very specific to starting partnerships, or joint ventures, with local people, programs to restore fish habitat. An example is the Western Trout Initiative. Mark said discussion is ongoing between CNO and R1 on how to get the program going and how to establish a joint ventures program. Good news is that the House side of the '06 budget includes 1.75 million dollars fish habitat money, moving forward to make fisheries program habitat based.

Joint Venture (Smith)

Carey Smith said the Fisheries joint ventures program won't be run parallel to others. Migratory Birds has eastern, national, and north American. The Pacific Coast Joint Venture was established in 1991. The structure includes a Management Board and state steering committees. Carey is the coordinator, there are state coordinators, and two site coordinators. There are state strategic plans. See handout: U.S. Coordinator's Report for the Pacific Coast Joint Venture Management Board Meeting.

Science Support/Invasive Species (Heimowitz)

Paul Heimowitz said the core strategy for aquatic invasive species is I&E to prevent species going to refuges. A planning tool is the Hazard Analysis Control Comprehensive

Planning (HACCP). Trying to develop with hatcheries, now FROs. HACCP planning is working with refuges on early detection/rapid response.

FRIMA and/or Funding discussion (Jerry Van Meter)

Jerry can provide a couple of web sites available to gain basic information. Regarding money, Ron Rhew (CRFPO staff) is the Point of Contact for Refuges in Oregon, and a fisheries plan for the refuge needs to be in place.

2:30-2:50 Break

6. 2:50-5:00 Facilitated discussion

Identification of NWRs aquatic resource needs corresponding to CRFPO capabilities

Tim Cummings explained that in planning the workshop we thought about what we wanted the outcome to be and thought about what would be realistic to accomplish. We have accomplished getting a better idea of some of the needs refuges have identified. We will be following up to define, put more contrast, help prepare FONS/RONS. On CCP, what are you looking for-review, help with writing, collect baseline data? We learned more specific needs and will identify if they are anything CRFPO can help you with, near-term and long-term.

Vicki said the Fisheries Program is being held to more habitat standards through GPRA/performance measures. Fisheries will look at efforts for which we will be getting some credit—not a traditional process for us.

Doug Spencer said CCP plans are for 15 years but can be revised every 5; every refuge must have one; covers every aspect a refuge would do (administration, law enforcement, whole gamut); can bring in outside issues; would like to see Fisheries get together and advise, know aspects of watershed.

Fred Paveglio said fisheries help is needed at the front end—beginning of CCP. Refuges rely on Fred to set up habitat goals and objectives. We need to get help from fisheries at the initial stages.

Tim Cummings noted that CRFPO is not funded to do directly. We have assisted with the Gorge refuges, Hanford, now Sheldon. Howard Schaller asked about the schedule for CCPs. Which ones need assistance from aquatic resources? We have some staff—you need help; can this be scheduled so that we can assist throughout CCP needs.

Tim Whitesel asked if data gathering mean taking existing data or getting new data? Fred P. said to focus on species-what are conservation targets. Interrelate to habitat objectives (need your help) then management strategies to achieve objectives.

Doug said a parallel plan is NEPA; then funding part-fishing areas, boat ramp, research projects. Howard suggested we get CCP schedule and identify consensus goals and objectives from aquatic resources perspective in CCP using some kind of data. If data collection is extensive, we might put in FONS to develop CCP. We might need to get funding through FONS if data gaps or missing pieces are identified. Jerry Van Meter: probably is better not to look on single solution or source of funds or staff assistance. Be aware of appropriations committee and look at assuring that federal and state plans fit well. If you are putting teams together make sure they are multi-agency. Fred Paveglio said the best way is to take schedule and look at where fisheries needs are. Plans are for 15 years, but are not done in 15 years. Doug said there are many scoping meetings with partners. A draft is reviewed by the Washington Office.

Tim Cummings asked the earliest CCPs to start; Ridgefield and Oregon coast are certain this year. Would you want to get addressed the individual actions that we broke out? Fred Paveglio said you can help by identifying (through literature) what should be on a refuge. There is a basic need for inventory on a refuge and would like to have when we start a CCP. The Gorge CCP was started with a high level of work with CRFPO. Now starting in Ridgefield but don't have information. Sam Lohr: collaboration on CCP under research—include opportunity to get that data? Doug said we need basic data but that could be what your need could be; can be asking for within plan. Jerry Van Meter said it is an iterative process, don't look for static conditions.

There are some technical issues that just need discussion. Fisheries could/should be a core team member or an extended team member.

#### Identification of potential opportunities for demonstration projects for watershed restoration associated with NWRs

Howard Schaller said we are trying to look at a situation where we have a watershed with a subbasin plan. It would be run through refuges, AFR, states, tribe, ES, ARW and used as an integrated demonstration project. Refuge vehicle can be used as focus for I&E. Trying to see if refuges could identify situations that would be candidates that could be narrowed to one or two. Vicki said it would match wonderfully with Cross Program Recovery. Tim Cummings asked if watershed council(s) are pulled into developing CCPs (could be extended Team members). Vicki said Washington state is ahead of Oregon as far as sub basin planning. Is Washington more ready? The Lower Columbia Fish Recovery board has done a good job; there is a lot of focus on the Columbia all the time. Howard Schaller reiterated that the demo project would involved a watershed with a plan connected to a refuge.

Ralph Webber said the Tualatin River watershed is advanced subbasin plan. The council has a fully approved plan; 80 NGOs to do restoration. The Refuge will be largest federal ownership in basin. If you want an opportunity of something already going on, it is there in Tualatin.

Howard said for the watershed demonstration projects, would like to look at small, simple watershed and one that is more complex that may be well down the line. Are there opportunities or not? Ralph said Tualatin River is small but very complex. There is limited water in relation to the demand. Howard Schaller said he is thinking of Gee/Gibbons Cr.-large and small; Tualation for complex. Charlie Stenvall mentioned meetings with CRFPO 3 years ago on chum needs at Willapa. Needs are driven by what we (refuges) perceive needs are. Fisheries people presence would be having different perspective that may result in different needs identified.

Vicki said to incorporate the culvert report. Get refuge managers a copy; most of refuge system has not been surveyed. Howard we would need a FONS. Forrest said WWFVO would get money to do inventories. Fisheries came on doing it because of culvert litigation. It is highly likely that any fish passage impediments (improvements) need to get into budget arena, possibly as congressional add-ons.

Identification of contacts (NWR, CRFPO, RO) responsible for developing project proposals for RONS, FONS, internal and external funding sources

POC: CRFPO Sam Lohr  
POC: Refuges: Fred P./Forrest  
POC: RO: Vicki

## 7. Wrap up

Howard reviewed what we will do in terms of follow up: 1) work with Fred and Cameron on CCPs; 2) work with refuges for demonstrations projects; 3) follow up listing fisheries needs and see if there are any that we would have funding to do something right away. Jointly develop FONS/RONS to get funding in place.



## **APPENDIX D**

### **Willapa NWR**

Size - 27,500 acres (15,500 acres fee title / use deed, 12,000 acres Presidential Proclamation Boundary area). Also manages approximately 2,000 acres of FMHA easement properties with aquatic resources.

Location – Pacific County, Southwest Washington.

Habitats - Sand dune, old growth forest, second growth forest, grassland, estuarine mudflats and saltmarsh, fresh water wetlands and all or part of 19 streams or rivers with fish resources / opportunities.

Primary aquatic species - Chinook, Coho, Chum, Steelhead, Coastal Cutthroat, Lamprey.

Aquatic issues – Restore stream function and biodiversity to pre disturbed conditions on streams that are within the refuge as well as those that traverse private property. Much of the initial structural barrier problems have been or will soon be completed (dam removal, fish ladder construction, bridge installation, tide gate removal, tidal restoration). Some work on re establishing native fish species has been underway (chum, cutthroat trout, coho). A good amount of instream woody debris work has been completed, but riparian treatments, silt loading and reduction or elimination of problem roads remains. Much work is needed in understanding how to re establish the entire suite of aquatic organisms and under what conditions and prescriptions in streams where they have been extirpated.

### **Julia Butler Hansen Refuge for the Columbian White-tailed Deer**

Size – Approximately 6,000 acres.

Location - Wahkiakum County, Washington, Columbia and Clatsop County, Oregon.

Habitats – Forested Columbia River islands, grasslands, wetlands and more than 3,000 acres enclosed by dikes and tide gates for protection of CWT deer. Four streams or rivers are part of the refuge.

Primary aquatic species – All Columbia River stocks.

Aquatic issues - Optimizing salmonid rearing habitat within diked portions of the refuge as well as on Crims Island without impacting habitat for CWT deer (water quality, fish friendly tide gates, dike removal, predation, reestablishing bathymetry, invasive species). Reestablishment and restoration of streams with salmonid potential which traverse refuge and private ownerships.

### **Lewis and Clark NWR**

Size – Approximately 40,000 acres

Location - Clatsop County, Oregon

Habitats – tidally influenced open water, shoals and vegetated islands in the Columbia River from Astoria to Cathlamet.

Primary aquatic species – All Columbia River stocks

Aquatic issues - Effect of fish eating birds on listed Columbia River stocks and implications for seabird / colonial nesting bird management. Columbia River dredging and dredge spoil placement impacts on Salmonids.

## Ridgefield NWR

### Refuge information

<p><b>Refuge name:</b> Ridgefield NWR  <b>Manager:</b> <u>Jennifer Brown</u>  <b>Complex name:</b> <u>Ridgefield NWRC</u>  <b>Manager:</b> <u>Tim Bodeen</u></p>	<p><b>Location:</b>  Ridgefield, WA  Clark County  Southwest WA</p>	<p><b>Primary basin:</b>  Columbia River</p>
<p><b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i>  Main watercourses are the Columbia River and three small tributaries to the Columbia River. Lake River, Gee Creek, Campbell Slough and Bachelor Slough are all found within, or bordering the Refuge.</p>		
<p><b>Bachelor Island Unit:</b> Presently, Refuge-owned portions of Bachelor Island consist of approximately 158 acres of native riparian communities and 248 acres of wetlands. This majority of this Refuge unit is surrounded by a levee and the wetlands are filled with water pumped from the Columbia River.</p>		
<p><b>Carty Unit:</b> The Carty Unit is undiked, subjecting low elevation bottomland forests, riverine wetlands, lakes, and semi-permanent wetland habitats to the hydrological influences of the Columbia River. Reed canarygrass is well-established within portions of Gee Creek, the shorelines of Carty Lake, Middle Lake, and other sites with seasonally high soil moisture. Conversely, the bottomland forests bordering Lake River within the Carty Unit are structurally diverse with intact native shrub and ground covering layers.</p>		
<p><b>Ridgeport Dairy Unit:</b> The Service manages approximately 130 acres of wetland within the unit. Campbell Lake and the Sand Pit Ponds are the only wetlands within the unit that are connected to the Columbia River. All other wetland units are contained within dikes with water delivery capability through pumps. The largest contiguous riparian area borders Campbell Lake. Other riparian areas of the unit are typically thin corridors bordering fields, the Columbia River, or Lake River.</p>		
<p><b>River "S" Unit:</b> Prior to diking, which excluded this area from the river's flood plain, River 'S' was largely influenced by the river's hydrology and subject to frequent inundation by spring floods. Former habitats of River 'S' were presumably bottomland riparian communities and wooded seasonal wetlands. The River 'S' Unit consists of approximately 155 acres of native riparian habitat comprised of both mixed cottonwood/ash bottomland forests and stands of nearly pure Oregon ash. River 'S' now has 25 managed wetlands totaling 590 acres.</p>		
<p><b>Roth Unit:</b> The Roth Unit is not diked and is still somewhat influenced by river levels and ocean tides. The Roth Unit is bisected by Campbell Slough, which links the Columbia River to Campbell Lake.</p>		
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i>  Ridgefield NWR was established in 1965 to provide wintering habitat for dusky Canada geese and currently includes 5,150 acres. The primary habitat management objectives for the Refuge are to (1) provide wintering habitat for dusky Canada geese and other migratory waterfowl, (2) protect, restore, and enhance populations of threatened and endangered species, (3) maintain habitats for indigenous species and perpetuate natural diversity; and (4) provide for environmental education, research, and wildlife oriented recreation.</p>		
<p><b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i>  Dusky Canada geese and Sandhill cranes are the focus species of the Refuge. Various waterfowl, shore birds and long legged wading birds are present at different times of the year. Habitats and public use programs are managed to encourage their presence. Ground nesting bird species are also taken into consideration during seasonal management planning.</p>		
<p><b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i>  Anadromous salmonids may potentially be present at some periods during the year. The use of Gee Creek and Campbell Slough by these salmonids is not completely understood.</p>		
<p><b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects)</i></p>		

for watershed restoration). Please indicate yes or no to the following questions.)  
 Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes X No \_\_\_\_\_  
 Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes X No \_\_\_\_\_  
 Gee Creek Restoration Committee  
 Has the Fish and Wildlife Service been involved with the council or groups? Yes X No \_\_\_\_\_

**Specific issue or need information**

**Aquatic issue or need 1**: (please provide background information about the issue or need and why it is important)  
 Clark County Mosquito Control District has requested approval for BTI application to areas within and adjacent to Campbell Lake and Campbell Slough. The Refuge does not know if there is Anadromous fish use in these areas or at what point in the season the Slough and Lake become unsuitable for use. The Refuge needs more information about Salmonid use of these areas, and the effects or non-effects of BTI on those species. Application of BTI has also been requested in and around Gee Creek.

**Category of issue or need:** (please mark the blank(s) for all that apply)

- X aquatic species inventory/survey
- X habitat survey/assessment
- X monitoring program design or implementation
- \_\_\_\_\_ habitat restoration, creation, enhancement
- \_\_\_\_\_ fish passage barrier/adequate flow
- \_\_\_\_\_ invasive aquatic species
- \_\_\_\_\_ planning support

\_\_\_\_\_ other (please describe):

**Specific need:** (What type of action or information would likely address the issue or need?)  
 Information on what species are using Campbell Lake and Campbell Slough, Slough and Lake temperature data, and an assessment of BTIs potential effects in the system.

**Implications if the need is not addressed:**  
 The Refuge cannot make an informed decision on mosquito control without this information. With the Comprehensive Conservation Plan beginning for the Refuge, this request will need to be answered.

**Priority of need:** (What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))  
**1 out of 6**

**NWR Contact:**  
 Name: Jennifer Brown \_\_\_\_\_  
 Phone: (360) 887-3883 \_\_\_\_\_  
 Email: Jennifer\_Brown@fws.gov

**Aquatic issue or need 2**: (please provide background information about the issue or need and why it is important)  
 The refuge is in the early stages of developing a Comprehensive Conservation Plan. There are no fisheries biologists available on staff to assist with aquatic resource issues for the CCP.

**Category of issue or need:** (please underline or describe)

- \_\_\_\_\_ aquatic species inventory/survey
- \_\_\_\_\_ habitat survey/assessment
- \_\_\_\_\_ monitoring program design or implementation
- \_\_\_\_\_ habitat restoration, creation, enhancement
- \_\_\_\_\_ fish passage barrier/adequate flow
- \_\_\_\_\_ invasive aquatic species
- X planning support

\_\_\_\_\_ other (please describe):

**Specific need:** (What type of action or information would likely address the issue or need?)  
 Technical assistance concerning fishery issues is needed for preparing the CCP.

<p><b>Implications if the need is not addressed:</b> Risk of not identifying some fishery concerns early on in the development of the CCP..</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 2 of 6</p>
<p><b>NWR Contact:</b> Name: Jennifer Brown _____ Phone (360) 887-3883 _____ Email: Jennifer.Brown@fws.gov</p>

<p><b>Aquatic issue or need</b> <u>3</u> : <i>(please provide background information about the issue or need and why it is important)</i> The flow through the mouth of Gee Creek seems to continue to slow due to an increase of silt build up. The creek is also being choked by reed canarygrass. Both of these issues could potentially become barriers to cutthroat and coho and reduce juvenile rearing habitat for anadromous salmonids.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• _____ aquatic species inventory/survey</li> <li>• <u>X</u> habitat survey/assessment</li> <li>• _____ monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• <u>X</u> fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> <li>• _____ other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Evaluation of the silt build up and a comprehensive plan to reduce the amount of silt is needed. This plan may need to look at short term Refuge removal of silt and canarygrass, and a long term plan of reducing silt deposits from off-refuge.</p>
<p><b>Implications if the need is not addressed:</b> Potential opportunity to improve fish access to stream habitat in a protected area may be missed.</p>
<p><b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 3 of 6</p>
<p><b>NWR Contact:</b> Name: Jennifer Brown _____ Phone (360) 887-3883 _____ Email: Jennifer.Brown@fws.gov</p>

<p><b>Aquatic issue or need</b> <u>4</u> : <i>(please provide background information about the issue or need and why it is important)</i> The potential for introduction of invasive Zebra Mussels and New Zealand Mud Snail is likely in the near future. A current inventory of species already found in non-diked wetlands (Campbell Lake, Post Office Lake, Carty Lake) is necessary to make sure that these unwanted intruders have not yet arrived. Also, a plan to exclude these exotic species from the Refuge should be formulated before the infestation begins.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <u>X</u> aquatic species inventory/survey</li> <li>• _____ habitat survey/assessment</li> <li>• <u>X</u> monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• <u>X</u> invasive aquatic species</li> <li>• _____ planning support</li> <li>• _____ other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i></p>

Provide an inventory of non-diked wetlands, create a plan to decrease the likelihood of invasive species introduction, and monitor high-risk wetlands for introductions.
<b>Implications if the need is not addressed:</b> Opportunity to stop an infestation before it happens could be missed.
<b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 4 of 6
<b>NWR Contact:</b> Name: Jennifer Brown _____ Phone (360) 887-3883 _____ Email: Jennifer.Brown@fws.gov

<b>Aquatic issue or need</b> <u>5</u> : <i>(please provide background information about the issue or need and why it is important)</i> The current cutthroat project at Gee Creek has not answered the question of whether these fish are a local population or if they are anadromous. A second pit tag reader would need to be installed and monitored at the mouth of Gee Creek to answer this question.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• _____ aquatic species inventory/survey</li> <li>• _____ habitat survey/assessment</li> <li>• <u>X</u> monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> <li>• _____ other (please describe):</li> </ul>
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Add an additional pit tag monitoring site at the mouth of Gee Creek to assess if cutthroat are leaving the local system.
<b>Implications if the need is not addressed:</b> Potential opportunity to understanding of Refuge cutthroat population is missed.
<b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 5 of 6
<b>NWR Contact:</b> Name: Jennifer Brown _____ Phone (360) 887-3883 _____ Email: Jennifer.Brown@fws.gov

<b>Aquatic issue or need</b> <u>6</u> : <i>(please provide background information about the issue or need and why it is important)</i> Steam remediation is currently taking place at Port of Ridgefield. The site was currently a wood treatment site and is adjacent to Carty Lake. A contaminant plume was previously identified and contaminant studies have been completed in the past. No studies have been planned to evaluate the movement of the plume after the remediation is complete. Post Office Lake and Campbell Lake are both influenced by Columbia River water levels. These areas, especially Post Office Lake, may get inundated during flood waters and then do not get flushed. The potential for contamination of these Lakes has not been studied.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• _____ aquatic species inventory/survey</li> <li>• _____ habitat survey/assessment</li> <li>• <u>X</u> monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> </ul>

<ul style="list-style-type: none"> <li>• _____ planning support</li> <li>_____ other (please describe):</li> </ul>
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Plan a contamination monitoring program for Carty, Campbell, and Post Office Lakes.
<b>Implications if the need is not addressed:</b> Potential contamination of Refuge wetlands will not be identified.
<b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 6 of 6
<b>NWR Contact:</b> Name: <u>Jennifer Brown</u> Phone: <u>(360) 887-3883</u> Email: <u>Jennifer.Brown@fws.gov</u>

### Steigerwald NWR

#### Refuge information

<b>Refuge name:</b> Steigerwald Lake NWR <b>Manager:</b> James R. Clapp <b>Complex Name:</b> Ridgefield Complex <b>Manager:</b> Tim Bodeen	<b>Location:</b> Clark County Southwest Washington	<b>Primary basin:</b> Columbia River
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> The Columbia River passes along the south shore of the refuge. In 1965, the U.S. Army Corps of Engineers (COE) constructed a levee along the Columbia River to provide flood protection to the private landowners, Port of Camas-Washougal Industrial Park located west of the refuge, and SR 14 to the north of the refuge. This cut off Steigerwald Lake from its historical connection with the Columbia River.  Gibbons Creek flows from a watershed north of Washington State Road 14, through a bridge under SR 14, onto the refuge. Historically, the creek flowed into Steigerwald Lake, which then flowed in a shallow gradient into a ditch flowing to the west, where excess waters were pumped by the Port of Camas-Washougal Industrial Park to prevent flooding of their facilities. For almost 30 years, this was the only connection between Gibbons Creek, Steigerwald Lake, and the Columbia River. Because the waters of the lake had to pass through a set of expulsion pumps and a largely non-functioning tidegate, it was believed that the historical spawning population of salmon had not been able to migrate into Gibbons Creek. Shortly after the establishment of the refuge in 1965, biological staff found evidence of spawning near the outlet of Gibbons Creek into Steigerwald Lake, and learned that the tidegate had, in fact, been operational some of the time, allowing salmonids to pass through with the correct water conditions.  In 1992, the U.S. Army Corps of Engineers (COE) constructed a channel in an elevated dike to transport Gibbons Creek directly into the Columbia River, bypassing Steigerwald Lake. The elevated channel begins at a flow control structure south of State Route 14. At this point, structure design called for all flows up to 70 cfs to be routed into the elevated channel. Flows exceeding 70 cfs would be diverted into the original Gibbons Creek channel west of the elevated channel. Winter storms in excess of 100 cfs were to be infrequent, and excess waters would flow over a concrete spillway to the west.  Steigerwald Lake is approximately 300 acres in size, and much of its shallow water shoreline consists of invasive non-native reed canarygrass. There is a ditch which runs from east to west through the lake and its wetlands, left over from historical attempts to drain the lake for agricultural purposes.		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> This 1,049-acre refuge was established in 1987, and is closely tied to the mitigation impacts resulting from construction of the second powerhouse at the Bonneville Lock and Dam by the U.S. Army Corps of Engineers, “for the fish and wildlife mitigation purposes associated with this project”. Subsequent land acquisitions were related to mitigation for the construction of Federal hydroelectric dams on the Columbia		

River.
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> Current major management emphasis is to provide green grass pastures as forage areas for wintering Canada geese. The CCP lists a wide variety of habitat restoration goals (wetlands, riparian, grassland, oak savanna and woodland, and wet meadow), intended to benefit a wide variety of wildlife (avian, mammalian, reptiles, and amphibians).
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Chum salmon were documented using Gibbons Creek prior to the construction of the Columbia River dike in 1965. Between 1996 and 2003, spawning adult and migrating smolt Coho salmon (Candidate – Federal) have been found in small numbers in Gibbons Creek. Steelhead (Federal - Threatened, State – Candidate) and Chinook salmon (Federal - Threatened, State – Candidate) have been found using Gibbons Creek and its tributaries.
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes_____ No_____ Maybe__X__ There have been previous meetings with Clark County agencies to address Gibbons Creek water quality and habitat issues. To my knowledge, no one agency has taken charge and no recent meetings have occurred. Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes__X__ No_____ Unknown _____ If yes, please list the councils or groups. Has the Fish and Wildlife Service been involved with the council or groups? Yes__X__ No_____

**Specific issue or need information**

<b>Aquatic issue or need _1_:</b> <i>(please provide background information about the issue or need and why it is important)</i> Excessive movement of gravels into the area of the flow control structure on Gibbons Creek below SR14 have resulted in the system not operating as it was designed, with flows over the concrete spillway occurring much more frequently than originally thought. During the CCP process, this concern was brought up as an issue, indicating the potential loss of listed salmonids when Gibbons Creek flowed over the concrete spillway. A meeting with a variety of agency representatives to discuss that issue resulted in a suggestion by the Corps biologist to re-establish the connection between Gibbons Creek and the Columbia River through Steigerwald Lake, restoring its function as an off-river rearing area for juvenile salmonids. LCRFP staff were involved during early meetings with the Corps, but the Corps has indicated they no longer have a source of funding. Refuge staff has contacted Ducks Unlimited, which has expressed an interest in moving forward with the proposal presented by the Corps, utilizing grants for funding. As plans are developed for this project, LCRFP staff should be included to ensure that adequate salmonid issues are addressed.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• _____ aquatic species inventory/survey</li> <li>• _____ habitat survey/assessment</li> <li>• _____ monitoring program design or implementation</li> <li>• __X__ habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> </ul> __X__ other (please describe: Assist with planning of the restoration of Columbia River floodplain functions to Steigerwald Lake.
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Assist with planning of the restoration of Columbia River floodplain functions to Steigerwald Lake. This will probably require periodic meetings and phone calls, and perhaps some minor writing/review of fisheries related sections of documents required for approval of the final design by appropriate agencies.
<b>Implications if the need is not addressed:</b> The major goal for this project is to provide for juvenile

salmonid rearing habitat in Steigerwald Lake. It is important for Service Fisheries staff be involved in planning to ensure that fisheries issues/concerns are adequately addressed.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1 out of 3
<b>NWR Contact:</b> Name: James R. Clapp Phone: (360) 835-8767 Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a>

<b>Aquatic issue or need _2_:</b> <i>(please provide background information about the issue or need and why it is important)</i> A comprehensive conservation plan has been developed for the three Columbia Gorge Refuges – Pierce, Franz Lake, and Steigerwald Lake. One of the actions to be accomplished shortly after completion is to complete a fisheries management plan covering fisheries survey, management and environmental education activities on the refuge. There are no fisheries biologists available on staff to assist with the aquatic resource issues to be addressed in this plan.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i>  <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Technical assistance and review in writing this plan.
<b>Implications if the need is not addressed:</b> This plan is part of the requirements to complete the CCP, and should be done to adequately identify specific aspects of fisheries research, management, and environmental education to be conducted on the refuges.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 2 out of 3
<b>NWR Contact:</b> Name: James R. Clapp Phone: (360) 835-8767 Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a>

<b>Aquatic issue or need _3_:</b> <i>(please provide background information about the issue or need and why it is important)</i> Previous surveys completed by LCRFP staff have indicated a number of factors believed to be negatively impacting the Gibbons Creek aquatic system: (1) habitat fragmentation, especially by road culverts; (2) riparian vegetation removal; (3) in stream habitat simplification by large woody debris input reduction and removal; and (4) spawning habitat degradation by heavy inputs of fine sediment. It was recommended that the highest priority action is to remove barriers to habitat currently unavailable to anadromous fish. This would provide anadromous fish access to 10.2 miles of upstream potential spawning and rearing habitat.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i>  <ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input checked="" type="checkbox"/> habitat restoration, creation, enhancement</li> </ul>



<ul style="list-style-type: none"> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> </ul> <p>_____ other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Conduct a follow up habitat survey to determine changes in conditions in Gibbons Creek since the previous one done by CRFP biological staff. Provide technical assistance and presence when meeting with representatives from agencies/private owning the barriers; assistance in developing necessary documents to accomplish the desired action; and assistance in locating potential funding sources.</p>
<p><b>Implications if the need is not addressed:</b>  This action was identified in the CCP, and if not accomplished, lack of access to a potential additional 10.2 miles of spawning and rearing habitat upstream of the refuge boundary.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  3 out of 3</p>
<p><b>NWR Contact:</b>  Name: James R. Clapp  Phone: (360) 835-8767  Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a></p>

### Franz Lake NWR

#### Refuge information

<p><b>Refuge name:</b> Franz Lake NWR  <b>Manager:</b> James R. Clapp  <b>Complex Name:</b> Ridgefield Complex  <b>Manager:</b> Tim Bodeen</p>	<p><b>Location:</b>  Skamania County, Southwest Washington</p>	<p><b>Primary basin:</b>  Columbia River</p>
<p><b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> The Columbia River passes along the south shore of the refuge. Indian Mary Creek flows from a watershed north of Washington State Road 14, through two small culverts located on a small private inholding, and into Franz Lake. The Lower Columbia River Fisheries Enhancement Group is currently working on acquiring funding to replace the culverts with a full span bridge to improve anadromous fish passage.  There is a set of beaver dams along the narrower courses of Arthur Lake and the connection between Franz and Arthur Lakes which may influence fish passage to some degree.</p>		
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i>  This 552 acre refuge was established in 1990 under authority of the Fish and Wildlife Act of 1956, with a purpose “to preserve biodiversity along the Columbia River by protecting diverse and now rare Columbia River floodplain wetland and riparian habitats and forested watershed buffers”.</p>		
<p><b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> As identified in the CCP, management at Franz Lake NWR is primarily that of protection. The refuge does provide a special use permit to allow monitoring of a small area east of the Franz Lake dike for mosquitoes by the local mosquito control district and treatment with BTI as needed. Aquatic vegetation in Franz Lake is dominated by wapato (<i>Sagittaria</i> spp.), the tubers of which are fed on by wintering swans providing excellent wildlife viewing opportunities for the public using SR 14.</p>		
<p><b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Surveys of Franz and Arthur Lakes and their tributaries in 1996 and 1997 found juvenile Coho salmon (Candidate Federal) to be the most abundant salmonid in the wetland system. The adults likely spawn in nearby Goodbear and Archer Creeks, then as juveniles move into Franz Lake during high water events. The Coho smolts rear in the cooler waters of Poacher Springs and in Franz Lake during the warm summer months.  The LCRFP staff has collected information regarding salmonid use of Franz Lake to determine overlap between salmon use and mosquito breeding areas, and to determine fish feeding preferences.</p>		
<p><b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects</i></p>		

for watershed restoration). Please indicate yes or no to the following questions.)  
 Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes \_\_\_\_\_ No \_\_\_\_\_ Maybe X  
 There is a partial blockage to fish passage in Indian Mary Creek at the Burlington Northern railroad culvert. The recently completed Comprehensive Conservation Plan (CCP) identifies the assessment of these barriers with appropriate agencies for modification or removal.  
 Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes \_\_\_\_\_ No \_\_\_\_\_ Unknown X  
 If yes, please list the councils or groups.  
 Has the Fish and Wildlife Service been involved with the council or groups? Yes \_\_\_\_\_ No X

**Specific issue or need information**

**Aquatic issue or need \_1\_:** (please provide background information about the issue or need and why it is important)

Columbia River floodwaters provide breeding conditions for mosquitoes on Franz Lake and other wetland areas connected to the River. During the late 1990s, residents of Skamania, Washington, who consider Franz Lake to be a major source of mosquitoes in their community, requested permission to treat Franz Lake with the larvicide *Bacillus thuringiensis* var *israeliensis* (BTI). In a 2002 Compatibility Determination, the application of BTI in Franz Lake was determined not to be compatible because of the presence of the salmonids which had been found in some areas of Franz and Arthur Lakes. Site-specific research was needed to address: (1) overlap in seasonal habitat use between salmonids and mosquito larvae in the desired treatment area, (2) food resources used by salmonids in the treatment area, and (3) impacts of BTI on the aquatic invertebrate community in the treatment area  
 LCRFP staff has been collecting information to address the salmonid questions for the last year and a half.

**Category of issue or need:** (please mark the blank(s) for all that apply)

- \_\_\_\_\_ aquatic species inventory/survey
- \_\_\_\_\_ habitat survey/assessment
- \_\_\_\_\_ monitoring program design or implementation
- \_\_\_\_\_ habitat restoration, creation, enhancement
- \_\_\_\_\_ fish passage barrier/adequate flow
- \_\_\_\_\_ invasive aquatic species
- \_\_\_\_\_ planning support

X other (please describe): Complete subject report by Fall 2005.

**Specific need:** (What type of action or information would likely address the issue or need?)

Completion of the report of its findings during the fall 2005 would greatly facilitate evaluation of all data collected and developing a new compatibility determination at the request of the Skamania Mosquito Control District prior to the 2006 mosquito season.

**Implications if the need is not addressed:**

The completion of this report and re-evaluation of its findings in a timely manner were promised not only to the Skamania Mosquito Control District and local Skamania residents, but also to local legislative representatives who had been contacted by the Skamania residents and involved in meetings to explain the issues involved. All efforts should be made to complete this report and the invertebrate study to provide the information needed to rewrite the compatibility determination and obtain approvals for BTI treatment, if determined to be compatible.

**Priority of need:** (What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))

1 out of 3

**NWR Contact:**

Name: James R. Clapp  
 Phone: (360) 835-8767  
 Email: jim\_clapp@fws.gov

**Aquatic issue or need \_2\_:** (please provide background information about the issue or need and why it is important)

A comprehensive conservation plan has been developed for the three Columbia Gorge Refuges (Pierce,

<p>Franz Lake, and Steigerwald Lake). One of the actions to be accomplished shortly after completion is to complete a fisheries management plan covering fisheries survey, management and environmental education activities on the refuge. There are no fisheries biologists available on staff to assist with the aquatic resources issues to be addressed in this plan.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>          Technical assistance and review in writing this plan.</p>
<p><b>Implications if the need is not addressed:</b>          This plan is part of the requirements to complete the CCP, and should be done to adequately identify specific aspects of fisheries research, management, and environmental education to be conducted on the refuges.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>          2 out of 3</p>
<p><b>NWR Contact:</b>          Name: James R. Clapp          Phone: (360) 835-8767          Email: jim_clapp@fws.gov</p>

<p><b>Aquatic issue or need _3_:</b> <i>(please provide background information about the issue or need and why it is important)</i>          Assess man-made migration barriers (road and railroad culverts) to anadromous fish within the Indian Mary Creek watershed for subsequent removal or modification. This would provide anadromous fish access to 1.5 miles of upstream potential spawning and rearing habitat.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>          Conduct an aquatic species and habitat survey to determine actual potential for spawning and rearing habitat in Indian Mary Creek above the refuge. If found suitable, provide technical assistance and presence when meeting with representatives from agencies owning the barriers; assistance in developing necessary documents to accomplish the desired action; and assistance in locating potential funding sources.</p>
<p><b>Implications if the need is not addressed:</b>          This action was identified in the CCP, and if not accomplished, lack of access to a potential additional 1.5 miles of spawning and rearing habitat upstream of the refuge boundary.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>          3 out of 3</p>
<p><b>NWR Contact:</b>          Name: James R. Clapp</p>

Phone: (360) 835-8767  
 Email: [jim\\_clapp@fws.gov](mailto:jim_clapp@fws.gov)

**Pierce NWR**

<b>Refuge name:</b> Pierce NWR <b>Manager:</b> James R. Clapp <b>Complex Name:</b> Ridgefield Complex <b>Manager:</b> Tim Bodeen	<b>Location:</b> Skamania County, Southwest Washington	<b>Primary basin:</b> Columbia River
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**Watercourses and aquatic habitats present:** *(list main river, streams, lakes present; note types of habitat present or could be established through restoration)* The Columbia River passes along the south shore of the refuge. Tributaries include Grenia Creek, which flows into Pierce Lake (impounded water) then into Hardy Creek, which originates off-refuge and flows through the refuge into the Columbia River. An artificial spawning channel was constructed in the mid-1990's to supplement chum salmon spawning habitat, but has been unsuccessful thus far. Two backwater sloughs adjoin Hardy Creek, and a small unnamed stream flows into Lena's Lake, an impoundment formed by a dam and water control structure.

**Refuge background and purposes:** *(please provide brief background and original purposes of the NWR)* This 329-acre refuge was established in 1983 with a donation from Lena Pierce so the area could be used for "wildlife refuge, recreation or park purposes". The donation was accepted in accordance with the Migratory Bird Conservation Act of 1929, as an inviolate sanctuary for migratory birds. Mrs. Pierce wanted the land be managed, in part, to benefit the Western Canada goose.

**Species of management focus:** *(please note whether they are trust species, federally listed, or other status)* A variety of non-game birds are present during throughout the year, and a small number of waterfowl use the impoundments, especially the winter and migrating months. Habitats are managed to encourage their presence. No listed birds have been documented.

**Aquatic species:** *(present, potentially present, federally listed)* Hardy Creek hosts one of the last Chum salmon runs along the Columbia River. Small numbers of Coho also spawn in Hardy Creek.

**Watershed restoration opportunities:** *(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)*  
 Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes \_\_\_ No \_\_\_ Maybe X  
 Two elevated culverts on Hardy Creek upstream of the refuge block anadromous fish passage to upstream habitat. The recently completed Comprehensive Conservation Plan (CCP) identifies the assessment of these barriers with appropriate agencies for modification or removal.  
 Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes \_\_\_ No X  
 If yes, please list the councils or groups.  
 Has the Fish and Wildlife Service been involved with the council or groups? Yes \_\_\_ No X

**Specific issue or need information**

**Aquatic issue or need \_1\_:** *(please provide background information about the issue or need and why it is important)*  
 The Hardy Creek chum salmon run is one of the few remaining spawning populations along the lower Columbia River. LCRFP staff has conducted BPA-funded surveys of spawning adults and out-migrating juveniles during the past several years. It is important to continue this research to monitor the population and determine the possibility of management options for improvement of habitat for this species, including modifications to the auxiliary spawning channel.

- Category of issue or need:** *(please mark the blank(s) for all that apply)*
- X aquatic species inventory/survey
  - X habitat survey/assessment
  - \_\_\_ monitoring program design or implementation
  - X habitat restoration, creation, enhancement
  - X fish passage barrier/adequate flow

<ul style="list-style-type: none"> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Information concerning aquatic species and their habitats in Hardy Creek continues to be needed to determine management approaches for the area, both on a local and river-wide context. The need could be met by continuing the chum salmon surveys to determine species composition and distribution and to continue to evaluate potential stream restoration actions.</p>
<p><b>Implications if the need is not addressed:</b>  Opportunities to monitor chum salmon population and determine improved habitat conditions for a federally listed fish species at a national wildlife refuge would be missed.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  1 out of 3</p>
<p><b>NWR Contact:</b>  Name: James R. Clapp  Phone: (360) 835-8767  Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a></p>

<p><b>Aquatic issue or need _2_:</b> <i>(please provide background information about the issue or need and why it is important)</i>  A comprehensive conservation plan has been developed for the three Columbia Gorge Refuges (Pierce, Franz Lake, and Steigerwald Lake). One of the actions to be accomplished shortly after completion is to complete a fisheries management plan covering fisheries survey, management and environmental education activities on the refuge. There are no fisheries biologists available on staff to assist with the aquatic resources issues to be addressed in this plan.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Technical assistance and review in writing this plan.</p>
<p><b>Implications if the need is not addressed:</b>  This plan is part of the requirements to complete the CCP, and should be done to adequately identify specific aspects of fisheries research, management, and environmental education to be conducted on the refuges.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  2 out of 3</p>
<p><b>NWR Contact:</b>  Name: James R. Clapp  Phone: (360) 835-8767  Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a></p>

<p><b>Aquatic issue or need _3_:</b> <i>(please provide background information about the issue or need and why it is important)</i>  Assess man-made migration barriers (road and railroad culverts) to anadromous fish within the Hardy Creek watershed for subsequent removal or modification. This would provide anadromous fish access to 1.2 miles of upstream potential spawning and rearing habitat.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p>

<ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Conduct an aquatic species and habitat survey to determine actual potential for spawning and rearing habitat in Hardy Creek above the refuge. If found suitable, provide technical assistance and presence when meeting with representatives from agencies owning the barriers; assistance in developing necessary documents to accomplish the desired action; and assistance in locating potential funding sources.</p>
<p><b>Implications if the need is not addressed:</b>  This action was identified in the CCP, and if not accomplished, lack of access to a potential additional 1.2 miles of spawning and rearing habitat upstream of the refuge boundary.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  3 out of 3</p>
<p><b>NWR Contact:</b>  Name: James R. Clapp  Phone: (360) 835-8767  Email: <a href="mailto:jim_clapp@fws.gov">jim_clapp@fws.gov</a></p>

### Umatilla NWR

#### Refuge information

<p><b>Refuge name:</b> Umatilla  <b>Manager:</b> Brian Allen  <b>Complex name:</b> Mid- Columbia River Refuges  <b>Manager:</b> Gary Hagedorn</p>	<p><b>Location:</b>  Morrow County, Northeast Oregon  Benton County, Southeast Washington</p>	<p><b>Primary basin:</b>  Columbia River</p>
<p><b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i>  The main watercourses of the Umatilla National Wildlife Refuge are the Columbia River (Umatilla Pool of the John Day Lock and Dam Project) and distinct backwaters extending from the river, such as McCormack Slough (OR), Crowe Butte Slough (WA), Whitcomb Slough (WA) and Paterson Slough (WA). Open water comprises 40 percent of the Refuge and totals 10,300 acres. Riparian areas and emergent marsh encompass another 10 percent or 2,500 acres. Uplands make up the remainder of Refuge lands. The Umatilla Pool is currently maintained at elevations fluctuating between 265 and 262.5 feet (msl), with a maximum of 264 feet from April through September. Due to operational changes in pool level management that were initiated in 1993, as a result of salmon recovery, there have been substantial impacts to both riparian and emergent wetland habitats. Current summer-time pool elevations have dropped by as much as 4 feet from pre-1993 levels. Death and stress in riparian vegetation has been widespread and substantial losses have occurred to shallow open-water and emergent marsh habitats within backwater areas. Much riparian and wetland restoration work has been completed within the area of McCormack Slough, and plans include extending this type of restoration work throughout other areas of the Refuge, where impacts to salmonids are possible.</p>		
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i>  The Umatilla National Wildlife Refuge was created under Fish and Wildlife Coordination Act obligations due to the construction of the John Day Dam at River Mile 215. The project impounded waters along a 71 mile stretch of the mainstem Columbia River. The General Plan, signed in 1968, designated various lands to be set aside for the conservation and management of wildlife, including most lands located in the present day boundaries of the Umatilla NWR. The Refuge is located along the Washington and Oregon shores of the Columbia River and is located about one hour's drive southwest of the Tri-Cities area.  <b><i>Umatilla National Wildlife Refuge Purposes</i></b> (MAP not included)</p>		

**Initial Consultation:** Consultation with the Secretary of Interior as part of the process of the water resources development for the John Day Lock and Dam Project was completed with a report by the U.S. Fish and Wildlife Service titled *A Detailed Report on Fish and Wildlife Resources Affected by the John Day Lock and Dam Project*. Information in this report as well as correspondence between the Service and the Department of Army focuses on the creation for proposed management areas as compensation for waterfowl losses. Additional correspondence in the files (including internal DOA correspondence, a letter from the Assistant Secretary of the Interior to Chief of Engineers DOA, and a letter from the Secretary of the Army to the Senate Chairman for the Committee on Public Works) continues the focus on waterfowl resources for the proposed management area.

**General Plan:** A General Plan for the project was written in accordance with the Coordination Act. The General Plan states that “those lands and waters acquired for primary purposes of the project [John Day Lock and Dam] and found to have their greatest value in furthering the national migratory bird program will be made available by cooperative agreement to the Bureau of Sport Fisheries and Wildlife of the U.S. Fish and Wildlife Service for administration and management.”

In addition, “lands acquired specifically for wildlife use in accordance with the Rivers and Harbor Act of 1965 be transferred to the Bureau of Sport Fisheries and Wildlife of the U.S. Fish and Wildlife Service for management.”

**Rivers and Harbors Act of 1965 (Public Law 89-298):** Public Law 89-298 authorized the Secretary of Army to acquire additional lands to be part of the management area “for waterfowl management”. These lands are referred to as ‘special law lands’ (Exhibit A described as Exhibit C).

**1969 Cooperative Agreement:** Lands and waters of the Umatilla NWR entered into cooperative agreement with the Department of Army (Exhibit A described as Exhibit B) are made available “for the purpose of development, conservation, and management of wildlife resources thereon in accordance with said General Plan. The additional special law lands acquired for waterfowl management purposes in accordance with Section 204 of P.L. 89-298 [Exhibit A described as Exhibit C] . . . will be under the sole jurisdiction of the [Service] and not be subject to the terms and conditions [of the cooperative agreement].

**1995 Amendment to the 1969 Cooperative Agreement:** The cooperative agreement was modified “to include additional lands that were originally excepted from management by the Service because they were classified for recreation use”. These lands included portions of Blalock and Sand Dune Islands (see modification of Exhibit B lands). “All remaining terms and conditions of the Cooperative Agreement remain unchanged.”

**Additional Land Acquisitions:** Two land tracts of 670 acres and 27.6 acres were also subsequently added to the Refuge in 1975 and 2002, respectively. The acquisition authority for both tracts was the Fish and Wildlife Coordination Act, as well as the Emergency Wetland Restoration Act for the latter acquisition.

**Species of management focus:** *(please note whether they are trust species, federally listed, or other status)*

Species, species groups, or communities identified as “conservation targets” during the currently ongoing development of a Comprehensive Conservation Plan (CCP), as required by the Refuge Improvement Act of 1997, include the following:

- Shrub-Steppe Community (includes Long-billed Curlew as species of concern)
- Riparian Habitats
- Wetlands and Deepwater Habitats
- River Island Habitats
- Talus, Outcropping and Cliff Habitats
- \*Migratory Waterfowl
- \*Shorebirds
- Threatened and Endangered Species (Bald Eagle; Washington Ground Squirrel, Snake River Sockeye, Fall Chinook, Spring/Summer Chinook and Steelhead; Upper Columbia River Spring Chinook and Steelhead; Mid Columbia Chinook; Bull Trout and other possible salmonids)

\*Trust Species (all other conservation targets provide for various migratory birds as trust species)

**Aquatic species:** *(present, potentially present, federally listed)*

Anadromous salmonids are present during various times of the year, including Snake River Sockeye, Fall Chinook, Spring/Summer Chinook and Steelhead; Upper Columbia River Spring Chinook and Steelhead; Mid Columbia Chinook; Bull Trout and other possible salmonids. The presence of juvenile salmon rearing sites have been documented on the refuge and are adjacent proposed project areas.

**Watershed restoration opportunities:** *(We would like information about potential opportunities for*

*fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)*

Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes X No \_\_\_\_\_

Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes \_\_\_\_\_ No X

If yes, please list the councils or groups.

Has the Fish and Wildlife Service been involved with the council or groups? Yes \_\_\_\_\_ No X

**Specific issue or need information**

**Aquatic issue or need 1:** *(please provide background information about the issue or need and why it is important)*

The Refuge could use CRFPO expertise and support in developing future projects to restore degraded and reduced riparian and wetland habitats (as caused by water level management changes of the Umatilla Pool that were implemented for salmon recovery) in order to fulfill the purposes of the Umatilla NWR, as well as the goals of the refuge-system. There are needs within project planning and design to reduce negative impacts and to provide potential benefits to salmonids and their recovery.

**Category of issue or need:** *(please mark the blank(s) for all that apply)*

- X aquatic species inventory/survey
- X habitat survey/assessment
- \_\_\_\_\_ monitoring program design or implementation
- X habitat restoration, creation, enhancement
- \_\_\_\_\_ fish passage barrier/adequate flow
- \_\_\_\_\_ invasive aquatic species
- X planning support

X other (interagency involvement and coordination):

**Specific need:** *(What type of action or information would likely address the issue or need?)*

Information by CRFPO on aquatic species inventory and habitat assessment, as well as assistance with interagency involvement, would help guide planning and implementation of riparian and wetland habitat restoration projects.

**Implications if the need is not addressed:**

Potential opportunities to benefit salmon and their recovery would be missed, or implementation of restoration projects for riparian and wetland habitats could have detrimental results for salmon.

**Priority of need:** *(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))*

Riparian and wetland restoration and development is a top priority for management of the Refuge.

**NWR Contact:**

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 Phone: 541-922-4661  
 Email: [brian\\_allen@fws.gov](mailto:brian_allen@fws.gov)

**Bandon Marsh NWR**

**Refuge information**

<b>Refuge name:</b> Bandon Marsh NWR	<b>Location:</b> Coos County, Oregon	<b>Primary basin:</b> Coquille River
<b>Manager:</b> David Ledig		
<b>Complex name:</b> Oregon Coast NWRC		
<b>Manager:</b> Roy W. Lowe		

**Watercourses and aquatic habitats present:** *(list main river, streams, lakes present; note types of habitat present or could be established through restoration)*

The main watercourse through the Bandon Marsh NWR is the Coquille River. Small streams that run through the refuge include Spring Creek and Simpson Creek in the Bandon Marsh Unit and Fahy Creek, Overlook Creek and Redd Creek in the Ni-les'tun Unit of the Refuge. Associated habitats include tidal salt marsh, mudflats and sloughs, tidally influenced forested wetlands, freshwater forested wetlands, shrub swamp, diked pastures/wetlands, tide-gated freshwater drainage ditches and streams.



<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i>  Bandon Marsh NWR was established in 1983 with an approved refuge boundary of 289 acres. The refuge boundary was expanded in 1991 to include 100 acres of riparian forest area along the east side of the Bandon Marsh Unit. In 1999, the refuge was expanded again by an additional 588 acres when the Ni-les'tun Unit was established. The Ni-les'tun Unit was further expanded in 2003 to accept a donation of 23 acres. To date, a total of 890 acres has been acquired in fee title/donation from an approved boundary of 1,000 acres. The purposes for establishing the Bandon Marsh Unit of the refuge, were to preserve and enhance highly significant habitat (salt marsh), protect migratory waterfowl, and numerous species of shorebirds and fish, and to provide opportunities for wildlife-oriented recreation and nature study. The purposes for establishing the Ni-les'tun Unit of the refuge were to protect and restore wetlands to provide a diversity of habitats for migratory birds including waterfowl, shorebirds, wading birds and songbirds; restore intertidal wetlands for anadromous salmonids; protect and restore habitat for listed species; and provide wildlife-dependent public use opportunities compatible with refuge purposes.</p>
<p><b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i>  Primary management focus includes waterfowl and shorebirds (trust species), and anadromous salmonids including coho salmon (Oregon Coast ESU proposed threatened).</p>
<p><b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i>  Anadromous salmonids documented on the refuge include juvenile and adult coho salmon (Oregon Coast ESU proposed threatened), juvenile fall chinook salmon, juvenile steelhead and coastal cutthroat trout (various ages). Coquille Indian Tribe oral history indicates chum salmon may have spawned in Fahy Creek historically, but are not present now.</p>
<p><b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i>  Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <u> X </u> No <u>     </u>.  Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <u> X </u> No <u>     </u>.  If yes, please list the councils or groups.  Coquille Watershed Council  U.S. Forest Service  Bureau of Land Management  Coquille Indian Tribe  Has the Fish and Wildlife Service been involved with the council or groups?  Yes <u> X </u> No <u>     </u>.</p>

**Specific issue or need information**

<p><b>Aquatic issue or need <u> 1 </u>:</b> <i>(please provide background information about the issue or need and why it is important)</i>  The refuge has just initiated limited fish inventories and habitat survey/assessment work in cooperation with the Confederated Tribes of the Siletz Indians. The refuge has permitted some limited survey work by the Oregon Department of Fish and Wildlife and NOAA-Fisheries. However, the refuge does not have baseline information nor the personnel to conduct an adequate inventory of aquatic species, conduct habitat assessments, or design and initiate monitoring programs. The floodplain lowlands of the Ni-les'tun Unit are currently managed as diked pastures and include three tide gates that drain the area and three culverts that pass waters from Fahy Creek and Redd Creek under the county road. The existing tide gates and culverts have unknown effects on juvenile and adult salmonids (including proposed threatened coho salmon) passage and use of habitats behind dikes. The refuge has initiated planning and design for a large tidal marsh restoration project to be constructed on the Ni-les'tun Unit of the Refuge in 2007. This project will restore approximately 430 acres constituting the largest tidal marsh restoration project ever constructed in Oregon. The restoration will remove the dikes and tide gates and replace culverts under the county road. Fishery assistance with planning and design along with pre and post-construction monitoring is needed.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <u> X </u> aquatic species inventory/survey</li> <li>• <u> X </u> habitat survey/assessment</li> </ul>

<ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> monitoring program design or implementation</li> <li>• <input checked="" type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input checked="" type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  The refuge is need of baseline information for aquatic species occurrence and habitat survey assessment throughout the refuge. Baseline information and monitoring is necessary to insure that refuge management practices do not negatively impact salmonids and, where possible, improve habitat conditions. Fishery assistance is needed for restoration planning, design and pre and post-construction monitoring in the Niles'tun Unit. Further investigation associated with the recent discovery of introduced predatory crappie and largemouth bass in Fahy Creek is necessary before restoration plans can be developed for this area.</p>
<p><b>Implications if the need is not addressed:</b>  The refuge will be investing more than \$5 million in the planning and construction of the tidal marsh restoration project and associated county road rebuilding. This restoration project should greatly improve the overall health and productivity of the lower Coquille River estuary. It is imperative that this project be adequately monitored over time to evaluate the effectiveness of the restoration and determine the value of the restored habitat to salmonids and other estuarine-dependent aquatic species. Failure to adequately document the benefits of this restoration project could prevent future funding and support for restoration projects. This would also be a significant lost opportunity to obtain information that may be applicable to other refuges/locations in the Pacific Northwest.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  1 out of 2</p>
<p><b>NWR Contact:</b>  Name: Dave Pitkin  Phone: 541-867-4550  Email: <a href="mailto:Dave_Pitkin@fws.gov">Dave_Pitkin@fws.gov</a></p>

<p><b>Aquatic issue or need</b> <u>2</u> : <i>(please provide background information about the issue or need and why it is important)</i>  The refuge will begin preliminary work on a Comprehensive Conservation Plan in FY-06. There are no fisheries biologists available on staff to assist with aquatic resource issues for the CCP.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Technical assistance concerning fishery issues is needed for preparing the CCP.</p>
<p><b>Implications if the need is not addressed:</b>  Risk of not identifying some fishery concerns early on in the development of the CCP and failure to adequately plan for future habitat work in context of the CCP.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  2 of 2</p>
<p><b>NWR Contact:</b>  Name: Rebecca Chuck  Phone: 541-867-4550  Email: <a href="mailto:Rebecca_Chuck@fws.gov">Rebecca_Chuck@fws.gov</a></p>

## Siletz Bay NWR

### Refuge information

<b>Refuge name:</b> Siletz Bay NWR <b>Manager:</b> Roy W. Lowe <b>Complex name:</b> Oregon Coast NWRC <b>Manager:</b> Roy W. Lowe	<b>Location:</b> Near Lincoln City, Lincoln County, Oregon	<b>Primary basin:</b> Siletz River
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> Main watercourses through the Siletz Bay NWR include the Siletz River and Drift Creek. Associated habitats include tidal salt marsh, mudflats and sloughs, diked historic tidal marsh, and forested wetlands.		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> Siletz Bay NWR was established in 1991 with an approved refuge boundary of 1,937 acres. To date, a total of 466 acres has been acquired in fee title and 59 acres in a perpetual conservation easement. The purposes for establishing the refuge were to protect the remaining wetlands and uplands adjacent to Siletz Bay from rapidly encroaching development and to enhance and restore wetland habitats for a variety of estuarine-dependent fish and wildlife species.		
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> Primary focus includes anadromous salmonids (Oregon Coast Coho Salmon ESU -proposed threatened), waterfowl, and shorebirds [trust species]. Management actions include habitat protection and tidal marsh restoration.		
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Anadromous salmonids documented on the refuge include juvenile coho salmon (Oregon Coast ESU proposed threatened), juvenile and adult fall chinook salmon and coastal cutthroat trout (various ages).		
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, please list the councils or groups. Mid-Coast Watershed Council Confederated Tribes of the Siletz Indians U.S. Forest Service Has the Fish and Wildlife Service been involved with the council or groups? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

### Specific issue or need information

<b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> The refuge has initiated fish inventories and habitat survey/assessment work in Cooperation with the Confederated Tribes of the Siletz Indians. However, the refuge does not have baseline information nor the personnel to conduct an adequate inventory of aquatic species, conduct habitat assessments, or design and initiate monitoring programs. In addition, the refuge has completed two tidal marsh restoration projects including the lower Drift Creek project (4 acres, 2000), and the Millport Slough project (100 acres, 2003). Pre and post-construction fish monitoring has been done for the Millport Slough project in cooperation with the Confederated Tribes of the Siletz Indians.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input checked="" type="checkbox"/> monitoring program design or implementation</li> <li>• <input checked="" type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> </ul>

<ul style="list-style-type: none"> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  The refuge is need of baseline information including aquatic species occurrence and habitat survey/assessment. Some work has been accomplished in association with the Millport Slough Restoration project, but there has been no systematic approach on the refuge. The refuge has embarked on a tidal marsh restoration program that will include two future projects. Preliminary findings by fishery biologists with Confederated Tribes of the Siletz Indians shows greatly increased use of the Millport Slough project area by juvenile salmonids following restoration and placement of large wood. The Refuge and Tribe are in need of assistance to further analyze and publish this data and to design and implement a long term monitoring program for all refuge restoration projects.</p>
<p><b>Implications if the need is not addressed:</b>  The refuge has invested a lot of time and money on constructing tidal marsh restoration projects. These projects need to be adequately monitored over time to evaluate the effectiveness of the restoration and determine the value of the restored habitat to salmonids. Failure to adequately document the benefits of these restoration projects could prevent funding and support for future restoration projects. This would also be a lost opportunity to obtain information that may be applicable to other refuges/locations in the Pacific Northwest.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  1 out of 2</p>
<p><b>NWR Contact:</b>  Name: Dave Pitkin  Phone: 541-867-4550  Email: <a href="mailto:Dave_Pitkin@fws.gov">Dave_Pitkin@fws.gov</a></p>

<p><b>Aquatic issue or need</b> <u>2</u> : <i>(please provide background information about the issue or need and why it is important)</i>  The refuge will begin preliminary work on a Comprehensive Conservation Plan in FY-06. There are no fisheries biologists available on staff to assist with aquatic resource issues for the CCP.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Technical assistance concerning fishery issues is needed for preparing the CCP.</p>
<p><b>Implications if the need is not addressed:</b>  Risk of not identifying some fishery concerns early on in the development of the CCP and failure to adequately plan for future habitat work in context of the CCP.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  2 of 2</p>
<p><b>NWR Contact:</b>  Name: Rebecca Chuck  Phone: 541-867-4550  Email: <a href="mailto:Rebecca_Chuck@fws.gov">Rebecca_Chuck@fws.gov</a></p>

**Nestucca Bay NWR**

**Refuge information**

<b>Refuge name:</b> Nestucca Bay NWR <b>Manager:</b> Roy W. Lowe <b>Complex name:</b> Oregon Coast NWRC <b>Manager:</b> Roy W. Lowe	<b>Location:</b> Tillamook County, Oregon	<b>Primary basin:</b> Nestucca River
<p><b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i>                  Main watercourses through the Nestucca Bay Unit of the refuge include the Nestucca River and Little Nestucca River. Associated habitats include tidal salt marsh, diked tidally muted brackish marsh, tide-gated freshwater drainage ditches and stream (Upton Slough). Watercourses through the Neskowin Marsh Unit include Meadow Creek, Butte Creek and Hawk Creek, which are tributaries of lower Neskowin Creek. Freshwater wetland habitats within the Neskowin Marsh Unit are extremely diverse and include emergent marsh; three types of bogs (sedge fen, shrub carr, and sphagnum) forested lagg, and open ponds.</p>		
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i>                  Nestucca Bay Refuge was established in 1991 with an approved refuge boundary of 3,060 acres. The refuge boundary was expanded in 2000 to include the 375-acre Neskowin Marsh Unit. To date, a total of 831 acres has been acquired in fee title. The purposes for establishing the refuge were to provide wintering habitat for dusky Canada geese and Aleutian cackling geese (listed as endangered at the time) and to protect diverse coastal wetland habitats and upland buffers for a variety of migratory waterfowl, shorebirds, raptors, songbirds, anadromous fish, and other wildlife. The purposes for adding the Neskowin Marsh Unit was to conserve the unique Neskowin Marsh complex and associated rare coastal bog ecosystem and to assist in the recovery of species listed as threatened and endangered such as coho salmon.</p>		
<p><b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i>                  Primary focus includes dusky Canada goose and recently delisted Aleutian cackling goose (trust species) through cooperative pasture management, and anadromous salmonids through habitat management and tidal marsh restoration. Target fish species include coho salmon (proposed threatened), chinook salmon and cutthroat trout.</p>		
<p><b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i>                  Anadromous salmonids documented on the refuge include juvenile coho salmon (Oregon Coast ESU proposed threatened), juvenile fall chinook salmon and coastal cutthroat trout (various ages).</p>		
<p><b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i>                  Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <u> X </u> No _____.                  Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <u> X </u> No _____.                  If yes, please list the councils or groups.                  Nestucca/Neskowin Watershed Council                  Bureau of Land Management                  U.S. Forest Service                  Confederated Tribes of the Siletz Indians                  Has the Fish and Wildlife Service been involved with the council or groups?                  Yes <u> X </u> No _____.</p>		

**Specific issue or need information**

<p><b>Aquatic issue or need <u> 1 </u>:</b> <i>(please provide background information about the issue or need and why it is important)</i>                  The refuge has initiated fish inventories and habitat survey/assessment work in Cooperation with the Confederated Tribes of the Siletz Indians. The refuge has permitted some limited survey work by the Oregon Department of Fish and Wildlife and NOAA-Fisheries. However, the refuge does not have baseline information nor the personnel to conduct an adequate inventory of aquatic species, conduct habitat assessments, or design and initiate monitoring programs.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <u> X </u> aquatic species inventory/survey</li> </ul>

<ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input checked="" type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  The refuge is need of baseline information including aquatic species occurrence and habitat surveys. Pasture management practices and the presence of tide gates have unknown effects on juvenile salmonids (including proposed threatened coho salmon) using habitats behind dikes. Baseline information and monitoring is necessary to insure that refuge management practices do not negatively impact salmonids and, where possible, improve habitat conditions.</p>
<p><b>Implications if the need is not addressed:</b>  Refuge management activities could potentially impact salmonids and opportunities to improve habitat conditions for fish on the refuge would be lost. Information obtained may be applicable to other refuges/locations.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  1 out of 3</p>
<p><b>NWR Contact:</b>  Name: Dave Pitkin  Phone:541-867-4550  Email: Dave_Pitkin@fws.gov</p>

<p><b>Aquatic issue or need <u>2</u> :</b> <i>(please provide background information about the issue or need and why it is important)</i>  The refuge will begin preliminary work on a Comprehensive Conservation Plan in FY-06. There are no fisheries biologists available on staff to assist with aquatic resource issues for the CCP.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <p><input type="checkbox"/> other (please describe):</p>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Technical assistance concerning fishery issues is needed for preparing the CCP.</p>
<p><b>Implications if the need is not addressed:</b>  Risk of not identifying some fishery concerns early on in the development of the CCP and failure to adequately plan for future habitat work in context of the CCP.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  2 of 3</p>
<p><b>NWR Contact:</b>  Name: Rebecca Chuck  Phone:541-867-4550  Email:Rebecca_Chuck@fws.gov</p>

<p><b>Aquatic issue or need <u>3</u> :</b> <i>(please provide background information about the issue or need and why it is important)</i>  The refuge will be constructing an 88-acre tidal marsh restoration project in the summer of 2006. This</p>
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<p>project will be one of the largest restoration projects along the Oregon north coast and will provide significant benefits to anadromous salmonids. Fish survey work conducted in cooperation with the Confederated Tribes of the Siletz Indians shows that significant use of the area by coho salmon, chinook salmon and cutthroat trout is already occurring due to tide gate failure and a levee breach. A more thorough pre-construction inventory and assessment would provide the refuge and refuge partners with data to evaluate the effects of the restoration.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <u>  X  </u> aquatic species inventory/survey</li> <li>• <u>  X  </u> habitat survey/assessment</li> <li>• <u>  X  </u> monitoring program design or implementation</li> <li>• <u>  X  </u> habitat restoration, creation, enhancement</li> <li>• <u>  X  </u> fish passage barrier/adequate flow</li> <li>• <u>      </u> invasive aquatic species</li> <li>• <u>      </u> planning support</li> <li><u>      </u> other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Inventory and habitat assessment work along with assistance in restoration design and establishing a long term monitoring plan.</p>
<p><b>Implications if the need is not addressed:</b> Lost opportunity to evaluate the effectiveness of the tidal marsh restoration project and the benefits to anadromous salmonids. Results of this project could be applied to future refuge complex restoration projects.</p>
<p><b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 3 of 3</p>
<p><b>NWR Contact:</b> Name: Dave Pitkin Phone:541-867-4550 Email:Dave_Pitkin@fws.gov</p>

**Tualatin NWR**

**Refuge information**

<p><b>Refuge name:</b> Tualatin River and Wapato Lake NWRs <b>Manager:</b> Ralph Webber <b>Complex name:</b> _____ <b>Manager:</b> _____</p>	<p><b>Location:</b> Washington and Yamhill Counties, Northwest Oregon</p>	<p><b>Primary basin:</b> Columbia River</p>
<p><b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> Present and/or remnant aquatic-related cover types requiring restoration represent habitats of seasonal herbaceous, scrub-shrub, and forested wetlands as well as riparian forests and perennial streams and rivers. Reaches of the Tualatin River bisect both managed areas. Floodplain riparian forests may not be considered an aquatic habitat in the classic sense, however, they play a major role in the health and function of riverine systems. Historically, the Tualatin River was supported by vast contiguous floodplains comprised of riparian forests. Two major tributaries, Chicken and Rock Creeks, flow through the central core of Tualatin River Refuge before meeting and entering the river. In addition, there are numerous small seasonal springs, seeps, and creeks which flow directly into the river. Perennial streams flowing into the river near the Wapato Lake area include Scoggins, Ayers, Gales, and Wapato Creeks.</p>		
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> Tualatin River Refuge and the proposed Wapato Lake Refuge are located within the Tualatin River watershed, a drainage of 712 square miles covering most of Washington County and parts of Yamhill County, in the Willamette Valley of northwestern Oregon. Established in 1992, the Tualatin River Refuge near Sherwood serves a purpose to restore, protect, and manage wetland, riparian, and upland habitats for a variety of migratory birds, fish, threatened and endangered species, other resident wildlife, and for the</p>		

enjoyment of people. When acquisition is complete, the Refuge will consist of 3,060 acres of primarily floodplain habitats within the lower mid-section of the watershed. The preferred acquisition boundary alternative for the proposed Wapato Lake Refuge covers approximately 4,200 acres near Gaston. Landscapes supporting fish and wildlife species are very similar to those of Tualatin River Refuge, but there is a greater abundance and distribution of aquatic habitats. Therefore, many fishery and management issues are common to both managed areas.

**Species of management focus:** *(please note whether they are trust species, federally listed, or other status)*

Refuge landscapes are predominately flat bottomland bordered by uplands. Habitats consist of riverine systems, seasonally inundated wetlands, riparian forests, wet and dry meadows, oak and pine savanna, and mixed forested uplands. When flooded in fall and winter, the areas provide maintenance habitat for resting and wintering ducks, Canada geese, tundra swan, and a variety of other waterbirds. Dominant ducks consist of northern pintail, mallard, and wigeon. Canada geese include dusky and cackling sub-species. Also supported are significant breeding populations of wood duck and, to a lesser extent, hooded merganser, cinnamon teal, and mallard. Furthermore, both areas provide significant breeding habitat for neotropical landbirds. Federally protected species which frequent or could be reintroduced to both areas include 2 endangered and 5 threatened species, 3 candidate species, and 20 species of concern.

**Aquatic species:** *(present, potentially present, federally listed)*

Federally-managed anadromous species of fish which depend on the Tualatin River system to fulfill a portion of their life history requirements include upper Willamette River stocks of winter steelhead, spring Chinook salmon, and the Pacific lamprey. Coho salmon were artificially introduced to the Tualatin River as a mitigation measure when the Bureau's Scoggins Dam project was completed years ago to create Hagg Lake. Although not considered native to the Tualatin system, adult returns of coho salmon are spawning naturally in upper reaches of Gales Creek and in the mainstem of the river.

**Watershed restoration opportunities:** *(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)*

Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes  No

Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes  No

If yes, please list the councils or groups.

Tualatin River Watershed Council, Bureau of Reclamation, Tualatin Riverkeepers, Raindrops to Refuge, Metro Green Spaces, Natural Resources Conservation Service, Ducks Unlimited, The Nature Conservancy, Clean Water Services, and numerous other NGOs.

Has the Fish and Wildlife Service been involved with the council or groups? Yes  No

**Specific issue or need information**

**Aquatic issue or need 1 :** *(please provide background information about the issue or need and why it is important)*

The Bureau of Reclamation has entered into the environmental compliance planning stages for a major project to raise Scoggins Dam 40 feet in elevation. The purpose of the project is to increase storage capacity in an effort to meet projected municipality demands for water and provide additional irrigation water for agriculture. From the Bureau's perspective, an additional project benefit is enhancing flood control capability during the winter months. Natural hydrologic inputs are inadequate to meet enlarged recharge requirements, therefore, water discharges from Clean Water Services treatment facilities will be back-pumped during winter to fill the reservoir. This project is being sponsored by a joint water commission consisting of the Cities of Hillsboro, Forest Grove, Beaverton, and Tigard as well as the Tualatin Valley Irrigation District and Clean Water Services. Needless to say this project has strong political overtones. Congressman Wu's office is involved and supportive of the project, although field representatives have indicated they expect to see a balanced and responsible approach be used in the allocation of water resources, including needs of restored and managed water-dependent habitats of the floodplain.

**Category of issue or need:** *(please mark the blank(s) for all that apply)*

- aquatic species inventory/survey



<ul style="list-style-type: none"> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> <li>• <input type="checkbox"/> other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  At present, the Bureau is addressing only in-stream requirements of aquatic resources and is not considering impacts of winter flood control on water-dependent habitats of the floodplain. These habitats provide backwater sanctuary and play a critical role in the health and function of the mainstem Tualatin River supporting anadromous fish. Fisheries office expertise can help solidify the position of the Service by joining Refuge staff in coordination meetings and for writing official comments to the Bureau.</p>
<p><b>Implications if the need is not addressed:</b>  Potential opportunity to solidify a position of the Service could be missed resulting in possible long-term resource impacts to both refuge managed areas impeding the ability to fulfill purposes for establishment and operational goals.</p>
<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>  1 out of 6</p>
<p><b>NWR Contact:</b>  Name: Ralph Webber  Phone: (503) 590-5811  Email: Ralph_webber@fws.gov</p>

<p><b>Aquatic issue or need 2 :</b> <i>(please provide background information about the issue or need and why it is important)</i>  The Army Corps of Engineers relies heavily on consultation processes with NOAA Fisheries when making decisions as to the type of permit and what stipulations will be invoked for permitting Refuge-sponsored habitat restoration projects falling within federally-listed anadromous fish watersheds. Even though restoration projects are designed with the best of intentions to benefit both migratory birds and fish, stipulations as written conditions of permits can be fairly restrictive. Agencies take a very conservative approach when permitting a project because little site specific information is available for the fishery in question. It is difficult to design a project when it is unknown whether or not juvenile salmonids rear in lower reaches of the Tualatin River, and if so, what season of the year they are present and what habitats they prefer. The only biological information known for certain is that the river supports marginal rearing conditions in summer because lower reaches are characterized with elevated water temperatures and significant populations of predatory fish.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> <li>• <input type="checkbox"/> other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>  Develop protocols and conduct a one year survey to determine seasonal presence and use of habitats by juvenile salmonids for reaches of the river adjacent to and/or near Refuge managed lands. Information will be used by Refuge staff to facilitate consultation and regulatory permitting processes and better address fish needs in the design and operation of restoration projects.</p>
<p><b>Implications if the need is not addressed:</b>  Potential opportunity to survey for presence and use of habitats by juvenile salmonids could be missed to improve long-term management of federally listed fish.</p>

<p><b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i></p> <p>2 of 6</p>
<p><b>NWR Contact:</b></p> <p>Name: Ralph Webber  Phone: (503) 590-5811  Email: <a href="mailto:ralph_webber@fws.gov">ralph_webber@fws.gov</a></p>

**Aquatic issue or need 3 :** *(please provide background information about the issue or need and why it is important)*

The Army Corps of Engineers consults with the Oregon Department of Environmental Quality when determining what stipulations will be invoked to meet water quality certification requirements for permitting Refuge-sponsored habitat restoration projects. Even though restoration projects are designed to benefit both migratory birds and fish, stipulations as written conditions for permits can be fairly restrictive relative to operational management of seasonal wetlands. Restoration projects for wetlands incorporate specialized features into the design of water control structures to serve both fish passage and water management criteria. Natural swales serve as off channel habitat during flood events, but can also strand fish when flood waters recede from the floodplain. Control structures are used in combination with low flow channels to encourage the movement and exiting of fish from these swales to reduce entrapment. In addition, these structures are used for de-watering wetlands to provide shorebird habitat and to promote the best hydric soil conditions for germinating wetland plants used by migrant waterfowl in fall and winter. Because the Tualatin River is a temperature limited system due to high water temperatures in summer, the Corps has taken a conservative approach with their permit restrictions in not allowing the de-watering of wetlands beyond April. The thinking is that a drawdown of wetlands beyond this month will contribute to further warming of the river. This approach to protecting the river does not go without consequences and resource trade-offs. One issue is that a drawdown of wetlands in April encourages the germination of reed canarygrass. Additionally, this early drawdown is outside the window of time when conditions inherent to the Willamette Valley are best for germinating and growing the majority of our native wetland plants. At present, no information is available as to what temperature-related impacts to the river and to listed salmonids could be expected if wetlands were de-watered from May through June.

- Category of issue or need:** *(please underline or describe)*
- aquatic species inventory/survey
  - habitat survey/assessment
  - monitoring program design or implementation
  - habitat restoration, creation, enhancement
  - fish passage barrier/adequate flow
  - invasive aquatic species
  - planning support
  - other (please describe):

**Specific need:** *(What type of action or information would likely address the issue or need?)*

Develop protocols and conduct monitoring of water temperatures within both seasonal wetlands and specific reaches of the Tualatin River. Objectives of this monitoring effort are to capture and assess seasonal variation and rate of drawdown effects on river temperatures as a criteria for sustaining water quality, as well as effects on listed salmonids of the river, under a variety of de-watering scenarios and schedules. Information will be used by Refuge staff to facilitate regulatory permitting processes so goals of restoration projects can be fulfilled addressing needs of both migratory birds and aquatic resources of the Tualatin River.

**Implications if the need is not addressed:**

Potential opportunity to monitor seasonal variation and rate of drawdown effects on river temperatures could be missed to improve long-term management of both migratory birds and aquatic resources of the Tualatin River, with an emphasis on federally listed fish.

<p><b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i></p> <p>3 of 6</p>
<p><b>NWR Contact:</b></p>

Name: Ralph Webber  
 Phone: (503) 590-5811  
 Email: [ralph\\_webber@fws.gov](mailto:ralph_webber@fws.gov)

**Aquatic issue or need 4 :** *(please provide background information about the issue or need and why it is important)*  
 Many natural swale and off-channel wetlands either currently occur, or existed historically, within the Tualatin River floodplain. Over the past two centuries, many of these wetland basins were drained to conduct agricultural practices by constructing surface ditches and installing underground tiles. Some basins of the Refuge flood on an annual basis while others flood infrequently depending on their elevations within the floodplain. Restoring hydrology and wetland function to these basins often requires a combination of removing drain tiles, plugging surface ditches, and/or reestablishing historic natural levees along the river's edge. Ironically, restoring hydrology to these basins creates a regulatory issue of entrapment for listed salmonid species. Fish can become isolated from receding flood waters of the river and left stranded within naturally occurring restored basins. Historically, this was part of the natural process whereby stranded fish became a source of food for other wildlife. Recognizing the current population status of listed salmonids, it is important that the Refuge provide an opportunity for the return of fish to the river. Tualatin River Refuge, in consultation with NOAA Fisheries and the Oregon Department of Fish and Wildlife, has custom-designed a water control structure with an overshot gate to encourage the passage of fish through the structure. The gate is equipped with a V-shaped notch designed for increasing water velocities at low flows to encourage escapement of juvenile salmonids. Current conditions placed on the approval of permits require that a given wetland basin be completely de-watered following a flood event to allow passage of salmonids. De-watering is often not in the best interest of other wildlife species and may prevent growth of desirable wetland plants, while at the same time creating conditions favorable for the establishment of non-native species. In addition, water may not be available to refill the basin a second time given reduced operational budgets to cover pumping costs.

- Category of issue or need:** *(please underline or describe)*
- aquatic species inventory/survey
  - habitat survey/assessment
  - monitoring program design or implementation
  - habitat restoration, creation, enhancement
  - fish passage barrier/adequate flow
  - invasive aquatic species
  - planning support
  - other (please describe):

**Specific need:** *(What type of action or information would likely address the issue or need?)*  
 Develop protocols and conduct monitoring of water management actions of wetlands to determine the presence of listed salmonid species following a river flood event, and whether or not fish are passing safely through the structure prior to and during a complete de-watering of the basin. Refuge staff will use this information to help assess and adapt operations in wetland management, modify the design of water control structures, and promote the use of improved designs for application on other wetland restoration projects.

**Implications if the need is not addressed:**  
 Potential opportunity to monitor water management actions encouraging fish passage from wetlands following a flood event could be missed to improve long-term management of federally listed fish.

**Priority of issue/need:** *(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))*  
 4 of 6

**NWR Contact:**  
 Name: Ralph Webber  
 Phone: (503) 590-5811  
 Email: [ralph\\_webber@fws.gov](mailto:ralph_webber@fws.gov)

**Aquatic issue or need 5 :** *(please provide background information about the issue or need and why it is important)*  
 It is well known that many common culverts used in road and other types of stream crossings may present

<p>barriers to the movement of fish. The issue of culverts as barriers to fish passage on federal land has recently been elevated in importance due to recent litigation. In order to address this issue at the Refuge, existing culverts must be evaluated to determine what, if any, actions must be taken. None of the culverts on the Refuge have been evaluated for fish passage.</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> <li>• <input type="checkbox"/> other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>          Personnel with expertise in fish passage are needed to evaluate and document existing culverts and/or those in need of replacement on the Refuge, and to provide recommendations for implementation.</p>
<p><b>Implications if the need is not addressed:</b>          Potential opportunity could be missed to improve fish access to stream habitat in a protected area.</p>
<p><b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i>          5 of 6</p>
<p><b>NWR Contact:</b>          Name: Ralph Webber          Phone: (503) 590-5811          Email: <a href="mailto:ralph_webber@fws.gov">ralph_webber@fws.gov</a></p>

<p><b>Aquatic issue or need 6 :</b> <i>(please provide background information about the issue or need and why it is important)</i>          Traditionally, users of water with primary and secondary rights to flows of the Tualatin River have used lift type pumping systems. This means of diverting water has been applied to serve needs of both agriculture and habitat management. The presence of federally- listed anadromous fish within this watershed has necessitated the use of approved pumping systems with fish screens. Although these systems function adequately, there are many drawbacks to their use which include high construction and maintenance costs, removal of stream-side vegetation for installation, and their visual intrusiveness on stream banks. An alternative to using a screened lift system is the use of a shallow well that is hydrologically connected to the river aquifer. The use of wells has an advantage in that all drawbacks associated with a lift system can be avoided. Most importantly, there are no direct impacts to listed salmonids because the natural bank of the river functions as a screen protecting fish from water diversion operations</p>
<p><b>Category of issue or need:</b> <i>(please underline or describe)</i></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> <li>• <input type="checkbox"/> other (please describe):</li> </ul>
<p><b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i>          Fisheries office support, in the form of both verbal and written documents provided during public scoping and regulatory comment periods, could boost the comfort and confidence level among regulators to authorize this relatively new concept of employing shallow well technologies in the implementation of Refuge projects.</p>
<p><b>Implications if the need is not addressed:</b>          Potential opportunity could be missed to encourage routine acceptance for use of shallow wells as an</p>

alternative in water delivery systems reducing future project costs and lessen potential environmental impacts.
<b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth)</i> 6 of 6
<b>NWR Contact:</b> Name: Ralph Webber Phone: (503) 590-5811 Email: <a href="mailto:ralph_webber@fws.gov">ralph_webber@fws.gov</a>

### Willamette Valley NWR

<b>Refuge name: Ankeny, Baskett Slough, W.L.Finley (includes Snag Boat Bend)</b> <b>Manager:</b> Doug Spencer <b>Complex name:</b> Willamette Valley NWRC	<b>Location:</b> Benton, Marion, Linn, and Polk County, Western Oregon	<b>Primary basin:</b> Willamette River
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> W.L.Finley- Muddy Creek and two main tributaries (Gray and Brown Creek); Snag Boat Bend-Willamette River and Lake Creek; Ankeny- Sidney Ditch, Bashaw Creek; Baskett Slough- South (Baskett) Slough.		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> The Willamette Valley Refuges were established in the mid-1960's for the purpose of providing wintering habitat for Dusky Canada geese. The Snag Boat Bend Unit of W.L.Finley was added in 2000 as habitat for migratory waterfowl and protection of riverine and riparian habitat.		
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> The Valley refuges serve as major wintering areas for Canada geese and other waterfowl. In addition, these refuges encompass native prairie and oak habitats that support several listed plant species and an endangered butterfly. Refuge aquatic habitats, in addition to supporting migratory waterfowl and other species, have major populations of the endangered Oregon chub.		
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Anadromous salmonids are present year-round in the Willamette River and seasonally in Lake Creek (Snag Boat), and are potentially present as rearing fish in Muddy Creek at high flows. Muddy Creek has resident cutthroat trout. The only listed salmonid is steelhead, found seasonally as juveniles in the Sidney Ditch on Ankeny.		

#### Specific issue or need information

<b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> Introduced populations of Oregon chub on W.L. Finley NWR recently suffered population declines after several years of expansion, and the testing is needed to determine if inbreeding depression is a possible cause. The WVNWRC, in a joint effort through the Oregon Chub Working Group, has been working with the CRFPO to conduct genetics testing on Oregon chub. In addition, the testing will help support recovery efforts regarding continued transplanting efforts, as a guide for the potential to mix populations from throughout the Willamette Valley and possibly benefit from "hybrid vigor".
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> aquatic species inventory/survey</li> <li>• <input type="checkbox"/> habitat survey/assessment</li> <li>• <input type="checkbox"/> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul>

<u>  X  </u> other (please describe): research-genetics testing
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Information on Oregon chub population genetics .
<b>Implications if the need is not addressed:</b> Potential opportunities to speed recovery and down-listing for a federally listed fish throughout its range, including NWR's, would be overlooked
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1 of 2
<b>NWR Contact:</b> Name: <u>Jock Beall, Senior Biologist</u> Phone: <u>541-757-7236</u> Email: <u>jock_beall@fws.gov</u>

<b>Aquatic issue or need</b> <u>  2  </u> : <i>(please provide background information about the issue or need and why it is important)</i> W.L. Finley NWR supports a naturally-occurring population of Oregon chub in Gray Creek. This population has fluctuated over the past decade, and water quality issues are considered a likely cause. The upper watershed of Gray Creek comes from off-refuge and is dominated by intensively managed industrial forest lands. The Refuge is working with the Oregon State Office and the CRFPO to conduct water quality monitoring on Gray Creek.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• <u>      </u> aquatic species inventory/survey</li> <li>• <u>      </u> habitat survey/assessment</li> <li>• <u>  X  </u> monitoring program design or implementation</li> <li>• <u>      </u> habitat restoration, creation, enhancement</li> <li>• <u>      </u> fish passage barrier/adequate flow</li> <li>• <u>      </u> invasive aquatic species</li> <li>• <u>      </u> planning support</li> <li>• <u>      </u> other (please describe):</li> </ul>
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Technical assistance concerning water quality monitoring
<b>Implications if the need is not addressed:</b> Potential opportunities to speed recovery and down-listing for a federally listed fish, including improvement of an existing population on a NWR would be overlooked
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 2 of 2
<b>NWR Contact:</b> Name: <u>Jock Beall, Senior Biologist</u> Phone: <u>541-757-7236</u> Email: <u>jock_beall@fws.gov</u>

### Malheur NWR

#### Refuge information

<b>Refuge name:</b> Malheur NWR <b>Manager:</b> <u>  Donna  </u> Stovall <u>      </u> <b>Complex name:</b> <u>      </u> <b>Manager:</b> <u>      </u>	<b>Location:</b> Harney County southeast Oregon	<b>Primary basin:</b> Harney Basin
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> Main watercourses are the Donner und Blitzen River, Silver Creek and the Silvies River. There are numerous spring systems associated with the Refuge. The Refuge is located in a closed basin. About a third to a half of the refuge (60,000-90,000 acres) consists of wetlands influenced by snow melt runoff.		

Other aquatic habitats are the various spring systems that flow through/or create the wetlands. Opportunities exist to restore/reclaim large numbers of wetland/riparian systems.
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> Malheur NWR was established in 1908. The original purposes of the refuge are to provide breeding and feeding grounds for migratory birds and other wildlife. Primary emphasis has been waterfowl, sandhill cranes and colonial nesting waterbirds
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> Various waterfowl, shorebird, water bird and wading birds (all trust species) are present during various periods during the throughout the year. Habitats are managed to encourage their presence. No listed birds have been documented. Several aquatic species have been petitioned for listing.
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> There are no longer any anadromous salmonids within the system as a result of natural factors. However, redband trout are present in substantial numbers along with other endemic species. There are no listed species at this time. There have been petitions to list the interior redband and the Harney spring snail. There are significant watershed aquatic invasive species issues.
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, please list the councils or groups. Harney Soil and Water Conservation District. The Refuge has an excellent relationship with the SWCD Has the Fish and Wildlife Service been involved with the council or groups? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

**Specific issue or need information**

<b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> The primary issue we deal with are the effects of common carp upon aquatic systems, especially shallow wetlands. We are also beginning to address Refuge management actions on aquatic habitat, fish and water quality in the Blitzen River.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• <input checked="" type="checkbox"/> aquatic species inventory/survey</li> <li>• <input checked="" type="checkbox"/> habitat survey/assessment</li> <li>• <input checked="" type="checkbox"/> monitoring program design or implementation</li> <li>• <input checked="" type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input checked="" type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input checked="" type="checkbox"/> invasive aquatic species</li> <li>• <input checked="" type="checkbox"/> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Monitoring and evaluation of various management actions.
<b>Implications if the need is not addressed:</b> Potential opportunities to monitor and perhaps improve habitat conditions for trust species and endemic fish at a NWR would be missed.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1 out of 3 #1) Invasive fish;
<b>NWR Contact:</b> Name: <u>Richard Roy</u> Phone: <u>541-493-2612</u> Email: <u>Richard_Roy@fws.gov</u>

<p><b>Aquatic issue or need <u>2</u></b> : (please provide background information about the issue or need and why it is important)</p> <p>The refuge is in the pre-planning stages of developing a Comprehensive Conservation Plan. There are no “independent” fisheries biologists available on staff to assist with aquatic resource issues for the CCP.</p>
<p><b>Category of issue or need:</b> (please underline or describe)</p> <ul style="list-style-type: none"> <li>• <u>  </u>x aquatic species inventory/survey</li> <li>• <u>  </u>x habitat survey/assessment</li> <li>• <u>  </u>x monitoring program design or implementation</li> <li>• <u>  </u>x habitat restoration, creation, enhancement</li> <li>• <u>  </u> fish passage barrier/adequate flow</li> <li>• <u>  </u>x invasive aquatic species</li> <li>• <u>  </u>X planning support</li> <li>• <u>  </u> other (please describe):</li> </ul>
<p><b>Specific need:</b> (What type of action or information would likely address the issue or need?)</p> <p>Technical assistance concerning fishery issues is needed for preparing the CCP.</p>
<p><b>Implications if the need is not addressed:</b></p> <p>Risk of not identifying some fishery concerns early on in the development of the CCP..</p>
<p><b>Priority of need:</b> (What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</p> <p>2 of 3 Habitat restoration</p>
<p><b>NWR Contact:</b></p> <p>Name: <u>  </u>Richard Roy<u>  </u></p> <p>Phone: <u>  </u>541-493-2612<u>  </u></p> <p>Email: <u>  </u>Richard_Roy@fws.gov<u>  </u></p>

<p><b>Aquatic issue or need <u>3</u></b> : (please provide background information about the issue or need and why it is important)</p> <p>The Refuge has to become better stewards of water resources, especially in the Blitzen Valley to protect various native fish species and comply with the Clean Water Act</p>
<p><b>Category of issue or need:</b> (please underline or describe)</p> <ul style="list-style-type: none"> <li>• <u>  </u> aquatic species inventory/survey</li> <li>• <u>  </u> habitat survey/assessment</li> <li>• <u>  </u> monitoring program design or implementation</li> <li>• <u>  </u> habitat restoration, creation, enhancement</li> <li>• <u>  </u>X fish passage barrier/adequate flow</li> <li>• <u>  </u>X invasive aquatic species</li> <li>• <u>  </u> planning support</li> <li>• <u>  </u> other (please describe):</li> </ul>
<p><b>Specific need:</b> (What type of action or information would likely address the issue or need?)</p> <p>Establishment of “minimum flows” for the Blitzen with materially affecting Refuge purpose</p>
<p><b>Implications if the need is not addressed:</b></p> <p>Potential opportunity to improve fishery in stream habitats in a high profile protected area may be missed.</p>
<p><b>Priority of issue/need:</b> (What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</p> <p>3 of 3</p>
<p><b>NWR Contact:</b></p> <p>Name: <u>  </u>same<u>  </u></p> <p>Phone: <u>  </u></p> <p>Email: <u>  </u></p>

**Sheldon NWR**

**Refuge information**

<b>Refuge name:</b> Sheldon NWR	<b>Location:</b>	<b>Primary basin:</b>
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<b>Manager:</b> ___Brian Day_ <b>Complex name:</b> Sheldon/Hart Mt. NWRC <b>Manager:</b> _David Johnson (Acting)	Columbia County, Northwest Oregon	Columbia River
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> The water courses on Sheldon are all within closed basins and have no outlet to the sea. Several man made reservoirs exist on the refuge with tributaries flowing into them. Virgin valley has a dozen impoundments at the lower end of the valley which contain habitat conditions for warm water species of fish. Big springs reservoir also contains habitat for trout, but is subject to going totally dry during extended drought periods.		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> Sheldon NWR was established in the 1930s primarily for the conservation of pronghorn. With the establishment of sole jurisdiction by the Game Range Bill, the objective was modified to “manage the refuge as a representative area of high desert habitat for optimum populations of native plants and animals.		
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> Primarily managed for large ungulate species such as pronghorn, mule deer, big horn sheep. Also native sagebrush obligate species such as Sage grouse, pygmy rabbits. Migratory waterfowl and songbirds are also managed for.		
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Lahontan cut-throat trout are found in several of the creeks (Virgin and Fish Creek) as well as Catnip reservoir where they are used as a transplant source for the Nevada Department of Wildlife. Tui chubs are also found in Fish Creek. The impoundments in lower areas of virgin creek contain Large mouth bass, yellow perch, crappie, bluegill, and red-eared sunfish.		
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <u>X</u> No _____ Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes _____ No <u>X</u> If yes, please list the councils or groups. Has the Fish and Wildlife Service been involved with the council or groups? Yes _____ No <u>X</u>		

**Specific issue or need information**

<b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> Habitat damage is occurring on all watersheds of the refuge as a result of grazing by feral horses. Siltation, loss of stream side riparian habitat, trampling and pollution associated with fecal matter are all contributing to the decrease of habitat quality.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• <u>  x  </u> aquatic species inventory/survey</li> <li>• <u>  X  </u> habitat survey/assessment</li> <li>• <u>  x  </u> monitoring program design or implementation</li> <li>• <u>  X  </u> habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> </ul> _____ other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Information concerning the impacts of feral horse populations on aquatic species and their habitats in the streams and impoundments is needed to help support the funding and management of these populations. Additional information is also needed about the status of aquatic species populations, species composition and distribution, aquatic habitats present and their condition, and evaluation of potential stream restoration

actions.
<b>Implications if the need is not addressed:</b> Loss of fish populations in these streams is possible if habitat conditions continue to deteriorate and drought conditions persist.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1 out of 3
<b>NWR Contact:</b> Name: <u>David Johnson</u> Phone: <u>541-947-3315</u> Email: <u>dave_n_johnson@fws.gov</u>

<b>Aquatic issue or need</b> <u>2</u> : <i>(please provide background information about the issue or need and why it is important)</i> The refuge is in the early stages of developing a Comprehensive Conservation Plan. There are no fisheries biologists available on staff to assist with aquatic resource issues for the CCP.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• <u>      </u> aquatic species inventory/survey</li> <li>• <u>      </u> habitat survey/assessment</li> <li>• <u>      </u> monitoring program design or implementation</li> <li>• <u>      </u> habitat restoration, creation, enhancement</li> <li>• <u>      </u> fish passage barrier/adequate flow</li> <li>• <u>      </u> invasive aquatic species</li> <li>• <u>  X  </u> planning support</li> <li><u>      </u> other (please describe):</li> </ul>
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Technical assistance concerning fishery issues is needed for preparing the CCP.
<b>Implications if the need is not addressed:</b> Risk of not identifying some fishery concerns early on in the development of the CCP..
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 2 of 3
<b>NWR Contact:</b> Name: <u>David Johnson</u> Phone: <u>541-947-3315</u> Email: <u>dave_n_johnson@fws.gov</u>

### Hart Mountain NWR

#### Refuge information

<b>Refuge name:</b> Hart Mountain National Antelope Refuge <b>Manager:</b> Kelly Hogan <b>Complex name:</b> Sheldon/Hart Mtn NWR <b>Manager:</b> Dave Johnson	<b>Location:</b> Lake County, Southeastern Oregon	<b>Primary basin:</b> Warner Basin
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> Main watercourses are Rock and Guano Creeks. In addition, the refuge has several small, spring-fed, streams.		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> Hart Mountain National Antelope Refuge was established in 1936 by executive order to protect pronghorn antelope and other wildlife.		
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i>		

Species of management focus on the refuge include pronghorn, sage grouse, pygmy rabbits, and bighorn sheep.
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Rainbow and Redband trout. Historic records of Tui Chub.
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <u>X</u> No _____ Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <u>X</u> No _____ Warner Basin Water Working Group Has the Fish and Wildlife Service been involved with the council or groups? Yes <u>X</u> No _____

**Specific issue or need information**

<b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> Since 1990 cattle grazing has been prohibited on Hart Mountain National Antelope Refuge. In the early 1990's preliminary data on stream ecology and fish abundance was collected. A follow-up study after 15 years without grazing would provide valuable comparative data to assess the impacts of grazing on stream ecology and fish abundance.
<b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i> <ul style="list-style-type: none"> <li>• <u>X</u> aquatic species inventory/survey</li> <li>• <u>X</u> habitat survey/assessment</li> <li>• _____ monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> <li>• _____ invasive aquatic species</li> <li>• _____ planning support</li> </ul> _____ other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Habitat assessments and surveys of fish populations along Rock and Guano Creeks would provide the needed information for comparison with existing data.
<b>Implications if the need is not addressed:</b> Data from this study would provide valuable information on the effects of removing cattle from riparian areas in the Great Basin.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1
<b>NWR Contact:</b> Name: David Johnson Phone: (541) 947-3315 Email: <a href="mailto:Dave_N_Johnson@fws.gov">Dave_N_Johnson@fws.gov</a>

**NWRs outside of CRFPO geographic scope**

**Nisqually NWR**

**Refuge information**

<b>Refuge name:</b> Nisqually NWR <b>Manager:</b> Jean Takekawa <b>Complex name:</b> Nisqually NWR Complex <b>Manager:</b> same	<b>Location:</b> Thurston County, Olympia, WA	<b>Primary basin:</b> Nisqually River basin Black River Unit and Grays Harbor NWR in Chehalis River basin
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat)</i>		

<p><i>present or could be established through restoration)</i></p> <p>Main watercourses for Nisqually NWR are the Nisqually River and south Puget Sound, including much of the Nisqually Delta and estuary. The Black River Unit and Grays Harbor are part of the Chehalis River watershed. The Black River is an important tributary in the upper Chehalis basin. Grays Harbor NWR is made up of estuarine habitat, located close to the mouth of the Chehalis River.</p>
<p><b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i></p> <p>Nisqually NWR was established in 1974 for the protection of migratory birds. Primary focus includes protection of the Nisqually Delta, estuary, and lower watershed, to benefit native fish, migratory birds, and threatened and endangered species. A recently completed CCP identifies estuarine restoration as a high priority to fulfill Refuge goals and objectives. Grays Harbor NWR was established in 1990, to conserve fish and wildlife including shorebirds and other migratory birds.</p>
<p><b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i></p> <p>A diversity of habitats supports more than 275 migratory bird and fish species. Refuges provide important habitat for waterfowl, shorebirds, waterbirds, neotropical songbirds, and raptors. Numerous endangered and threatened species occur here, including chinook salmon and the State listed Oregon spotted frog at Black River. Intensive freshwater wetland management and riparian restoration are part of Refuge management programs.</p>
<p><b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i></p> <p>Refuges provide important habitat for a variety of anadromous salmonids, including federally listed Chinook salmon in the Nisqually basin and bull trout. Chum, steelhead, coastal cutthroat trout, pink, and coho are also present.</p>
<p><b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i></p> <p>Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at the watershed scale? Yes <u>X</u> No _____</p> <p>Are there existing watershed councils or other groups involved in addressing issues at the watershed scale? Yes <u>X</u> No _____</p> <p style="padding-left: 40px;">If yes, please list the councils or groups.</p> <p style="padding-left: 80px;">Nisqually River Council Chehalis Basin Partnership</p> <p>Has the Fish and Wildlife Service been involved with the council or groups? Yes X No _</p> <p style="padding-left: 40px;">Voting member of Nisqually River Council; participated in Chehalis Basin Partnership meetings</p>

**Specific issue or need information**

<p><b>Aquatic issue or need <u>1</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i></p> <p>Nisqually NWR completed a CCP in November 2004, which identifies a 700 acre estuarine restoration project as a top priority. This is the largest estuarine restoration project of its kind in the Pacific Northwest. Restoration of the estuary is identified as the top priority to recover chinook salmon in the Nisqually basin. Specific site design, obtaining permits, pre and post restoration monitoring, and restoration construction are all immediate needs. A 3-year fish study is in its second year. The USFWS office in Olympia (WWFWO) assisted with study design. This cooperative study with Ducks Unlimited and the Nisqually Tribe, is the first ever comprehensive fish characterization in the Nisqually estuary. However, additional funding is needed to complete the study and repeat this monitoring effort, post-restoration. Only partial funding is available for the restoration project. A vegetation mapping effort is underway. Additional monitoring needs include key migratory bird, habitat, and physical process monitoring, in order to support adaptive management of the restoration project. Many partners are involved or support this large scale project.</p>
<p><b>Category of issue or need:</b> <i>(please mark the blank(s) for all that apply)</i></p> <ul style="list-style-type: none"> <li>• <u>X</u> aquatic species inventory/survey</li> <li>• <u>X</u> habitat survey/assessment</li> <li>• <u>X</u> monitoring program design or implementation</li> <li>• <u>X</u> habitat restoration, creation, enhancement</li> <li>• _____ fish passage barrier/adequate flow</li> </ul>

<ul style="list-style-type: none"> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <input type="checkbox"/> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Additional funding support is needed to complete the 3 year fish study pre-restoration. Assistance will be needed in order to accomplish a post restoration monitoring study.
<b>Implications if the need is not addressed:</b> Pre and post restoration monitoring are crucial, in order to support design, evaluation, and adaptive management of this estuarine restoration project. A certain level of monitoring will also be prescribed as part of permit requirements.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 1 out of 3
<b>NWR Contact:</b> Name: <u>Jean Takekawa</u> Phone: <u>360-753-9467</u> Email: <u>jean_takekawa@fws.gov</u>

<b>Aquatic issue or need <u>2</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> The Black River Unit of Nisqually NWR protects the northern half of the Black River, an important tributary of the upper Chehalis River. This relatively new Refuge area provides important habitat for a variety of anadromous fish, but even the most basic information regarding fish and habitat use are little known. The river and associated wetlands are becoming increasingly threatened by growing urbanization, development, water withdrawals, and habitat degradation. A recent hydrological study has shown that the hydrology of the River is already adversely affected by human alterations. However, little is known of the impacts on fish. A basic monitoring effort would be extremely valuable in identifying priorities in designing riparian and wetland restoration efforts, and habitat protection measures.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• <u>X</u> aquatic species inventory/survey</li> <li>• <u>X</u> habitat survey/assessment</li> <li>• <u>X</u> monitoring program design or implementation</li> <li>• <input type="checkbox"/> habitat restoration, creation, enhancement</li> <li>• <input type="checkbox"/> fish passage barrier/adequate flow</li> <li>• <input type="checkbox"/> invasive aquatic species</li> <li>• <u>X</u> planning support</li> </ul> <input type="checkbox"/> other (please describe):
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Technical assistance and accomplishing a monitoring effort would be invaluable in designing and prioritizing restoration efforts at Black River, and strengthening habitat protection.
<b>Implications if the need is not addressed:</b> Baseline information on fish resources of the Black River is needed to provide improved habitat protection and restoration. Hydrology is becoming increasingly compromised in this rapidly growing area.
<b>Priority of need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 2 of 3
<b>NWR Contact:</b> Name: <u>Jean Takekawa</u> Phone: <u>360-753-9467</u> Email: <u>jean_takekawa@fws.gov</u>

<b>Aquatic issue or need <u>3</u>:</b> <i>(please provide background information about the issue or need and why it is important)</i> Phragmites communis, or giant reed, is an aggressive non-native plant that has rapidly spread across Grays Harbor NWR estuarine habitat. This rapidly spreading invasive plant grows in salt marsh, mudflat, and
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slough habitats at the Refuge, degrading limited estuarine habitat that is crucial for anadromous fish and other wildlife.
<b>Category of issue or need:</b> <i>(please underline or describe)</i> <ul style="list-style-type: none"> <li>• _____ aquatic species inventory/survey</li> <li>• _____ habitat survey/assessment</li> <li>• _____ monitoring program design or implementation</li> <li>• _____ habitat restoration, creation, enhancement</li> <li>• <u>  X  </u> fish passage barrier/adequate flow</li> <li>• <u>  X  </u> invasive aquatic species</li> <li>• _____ planning support</li> <li>• _____ other (please describe):</li> </ul>
<b>Specific need:</b> <i>(What type of action or information would likely address the issue or need?)</i> Control has been initiated, but additional assistance and support are needed with control work and effects of Phragmites on habitat and fish and wildlife.
<b>Implications if the need is not addressed:</b> Phragmites is widespread on the Refuge, however it has not spread to many other parts of the Grays Harbor estuary. Effective control at the Refuge will greatly aid in reducing the source of seeds and plant parts in other parts of the estuary and help to refine the most effective control methods. Little is known of the effect of Phragmites on anadromous fish or habitat use in estuaries.
<b>Priority of issue/need:</b> <i>(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))</i> 3 of 3
<b>NWR Contact:</b> Name: <u>  Jean Takekawa  </u> Phone: <u>  360-753-9467  </u> Email: <u>  jean_takekawa@fws.gov  </u>

### Toppenish NWR

#### Refuge information

<b>Refuge name: Toppenish</b> <b>Manager:</b> Howard Browers____ <b>Complex name:</b> Mid-Columbia River <b>Manager:</b> <b>Gary Hagedorn</b>	<b>Location:</b> Yakima County, South central WA	<b>Primary basin:</b> Columbia River
<b>Watercourses and aquatic habitats present:</b> <i>(list main river, streams, lakes present; note types of habitat present or could be established through restoration)</i> Toppenish Creek, a tributary of the Yakima River, flows through the main portion of the refuge. Refuge habitats include wetlands, woody riparian, and shrub-steppe upland		
<b>Refuge background and purposes:</b> <i>(please provide brief background and original purposes of the NWR)</i> The refuge was established in 1964 with Duck Stamp funds to provide habitat for waterfowl and other migratory birds.		
<b>Species of management focus:</b> <i>(please note whether they are trust species, federally listed, or other status)</i> Various waterfowl and other waterbirds are present during fall, winter, and spring. Habitats are managed to encourage their presence. Bald eagles are present during late fall through early spring. Federally listed Mid-Columbia steelhead migrate through the refuge, but do not spawn on refuge.		
<b>Aquatic species:</b> <i>(present, potentially present, federally listed)</i> Federally listed Mid-Columbia steelhead migrate through the refuge via Toppenish Creek. Small numbers of Brook lamprey can also be found		
<b>Watershed restoration opportunities:</b> <i>(We would like information about potential opportunities for fisheries assistance considering the needs of watersheds that NWRs occupy (e.g., demonstration projects for watershed restoration). Please indicate yes or no to the following questions.)</i> Are there opportunities for restoration projects conducted on or off of refuge lands that consider issues at		

the watershed scale? Yes  No

Are there existing watershed councils or other groups involved in addressing issues at the watershed scale?  
 Yes  No

If yes, please list the councils or groups. Yakama Nation

Has the Fish and Wildlife Service been involved with the council or groups? Yes  No

**Specific issue or need information**

**Aquatic issue or need 1:** *(please provide background information about the issue or need and why it is important)*  
 Refuge management includes water diversions from Toppenish Creek into wetlands. Several of these diversions are currently unscreened which means that juvenile steelhead migrating downstream can be entrained into wetlands. Four years of capture/recapture data indicate that juvenile steelhead can escape wetland habitats, however some are probably lost due to predation from birds or other aquatic species (e.g. bullfrog, bass, northern pikeminnow), stranding, or stressful water temperatures later in the spring. Fish screens are scheduled to be constructed for some diversions. However, wetlands may have benefits for wintering juvenile steelhead. More information on steelhead use of wetlands is desired.

**Category of issue or need:** *(please mark the blank(s) for all that apply)*

- aquatic species inventory/survey
- habitat survey/assessment
- monitoring program design or implementation
- habitat restoration, creation, enhancement
- fish passage barrier/adequate flow
- invasive aquatic species
- planning support
- other (please describe):

**Specific need:** *(What type of action or information would likely address the issue or need?)*  
 Information concerning habitat use by steelhead in wetlands is needed to determine management approaches for the areas. Once screens are in place, do steelhead need to be excluded from wetlands at all times or are there periods in early spring where wetlands may provide wintering/rearing habitat.

**Implications if the need is not addressed:**

**Priority of need:** *(What is the rank of the issue/need relative to other aquatic resource issues at the NWR (i.e., 1 for the most important and so forth))*  
 1

**NWR Contact:**  
 Name: Howard Browers  
 Phone: 509-545-8588  
 Email: howard\_browers@fws.gov

## APPENDIX E

### Overview of the Columbia River Fisheries Program Office

It is the mission of the Columbia River Fisheries Program Office (CRFPO) to assist in determining the status of imperiled natural stocks, to evaluate management measures for recovery and assist in the recovery of these stocks, and to prevent future listings. The CRFPO's primary contribution to these activities is to design and implement monitoring and evaluation programs, coordination, and dissemination of fisheries information. The CRFPO also provides for science-based management of aquatic resources on federal and tribal lands in the area from the Columbia River mouth upstream to McNary Dam, streams throughout Oregon, and in other areas throughout the Columbia River Basin that have been and continue to be affected by anthropogenic actions of a regional scale. As it relates to fish and aquatic resources, the CRFPO provides technical assessment, interagency coordination, and representation on technical and policy level workgroups, committees, councils, and commissions for hydrosystem, hatchery, harvest, and habitat management.

#### Current capabilities and expertise at the CRFPO:

- Coordinate with others and participate in numerous management and scientific forums
- Conduct biological and habitat surveys and assessments
  - Describe and assess fish and other aquatic organism populations (distribution, abundance, life history, movement, habitat use, diets)
  - Assess the status and determine limiting factors for fish and other aquatic organisms at a population level
  - Describe and assess aquatic habitats (determine conditions, develop restoration actions)
  - Develop assemblage indices of fish and invertebrates
- Conduct instream flow and habitat assessments
  - Application of instream flow methodologies
  - Physical and biological habitat evaluation for anadromous and resident fish
  - Perform hydraulic and habitat modeling
  - Incorporate fish habitat requirements into FERC processes
  - Evaluation of fish passage
  - Design, implement, and assess large scale survival studies for fish populations that migrate through numerous mainstem dams
- Assess status and conservation needs of imperiled aquatic species
  - Design and implementation of aquatic resource monitoring programs
  - Provide analytic, biometric, and statistical support
  - Develop and evaluate life cycle, harvest, and production simulation models for anadromous and resident species
  - Develop and evaluate recovery strategies
  - Technical review and development of experimental design, modeling, and analytic approaches



- Application of conservation genetic principles for population identification and species conservation
- Evaluate operation and performance of hatcheries
  - Develop hatchery and genetic management plans
  - Evaluate wild and hatchery fish interactions, habitat use, and performance
  - Conduct studies to evaluate hatchery performance relative to survival and fisheries contribution
  - Conduct studies to improve hatchery performance and species conservation
  - Implement fish marking programs at hatcheries
- Provide education and outreach materials and opportunities

## **APPENDIX F**

(Graphics for the following presentations are contained in the file NWR-CRFPO 2005

Appendix F.pdf:

- Willapa NWR Complex,
- Mid-Columbia NWR Complex,
- Oregon Coast NWR Complex,
- Malheur NWR,
- CRFPO,
- Franz Lake NWR project,
- Pierce NWR chum salmon project,
- Malheur NWR project,
- Lower Columbia River islands project,
- Hanford project,
- CPR.)

## Questions and Answers re Fish Passage and FWS Properties and Facilities

Q: *Is a fish passage issue:*

- *A specific instream “structure” that warrants removal or modification to allow for fish passage or improve fish passage? Or*

- *A broader “subject matter” like...”should NFHs ensure migration, up and downstream of all fish in waters affected by the by instream structures maintained for the purposes of promoting fish culture?”*

A: I suppose that question could be answered in a number of ways. For example, fish passage issue could be defined as whatever problems or corrective measures that are identified in surveys, plans, or other means of scrutiny which are directed at the facility or property in relation to existing objectives, competing objectives, and/or policies of the site and its operations.

Or, it could be answered based on the definition of the words in the phrase, to wit, issue and fish passage.

**Issue:** A point or situation that causes, or is likely to cause, an impasse.

**Fish Passage (expressed as a barrier):** A barrier is an obstacle that prevents fish from moving either upstream or downstream. Barriers include structural and nonstructural barriers. The former includes dams, weirs, floodgates, roads, bridges, causeways and culverts. Barriers can be formed in the following ways:

- physical barrier: blocking free passage of fish, such as a dam, weir or raised causeway
- hydraulic barrier: barrier created by high flows or turbulence (eg flow through the pipes)
- behavioral barrier: fish may avoid moving through dark tunnels such as a pipe under a road crossing.
- pollution barrier: such as heat, chemicals, lack of oxygen.
- Other.

**Fish Passage (expressed as a project):** A fish passage project can be any activity that directly improves the ability of fish or other aquatic species to move by reconnecting habitat that has been fragmented by barriers. (FWS NFPP definition)

**Fish Passage Issue (expressed as professional opinion):** A fish passage issue is what the professional staff identify as an issue.

Q: *Recommended “Actions”. What is the standard for the determining proper action? That is, “must” all instream structures allow for the safe passage of all fish or native fish? What exceptions are there to a standard of “must”?*

A: There are all kinds of standards, including legal standards (e.g. is the project in compliance with ESA), hence the need to make a distinction between “recommended actions” and “agreed recommended actions”. The question is, given competing objectives, needs, and requirements (demands), and given various standards, weights, and other factors that might be in play, what is the solution(s) that:

- takes those competing demands, standards, and other factors into consideration,
- properly optimizes among them, and
- will best achieve the agreed objectives while adequately withstanding scrutiny of its validity and defensibility?

Problem solving and decision making are optimizing processes.

*Q: What are fish passage barriers and what happens if they are not addressed?*

A: A fish passage barrier is any obstacle that prevents fish from moving either upstream or downstream. The term is usually applied to those obstacles which have negative effects on the fish, but may also refer to obstacles which have positive effects on fish, such as fish screens.

Barriers can:

- Restrict migration of fish necessary for feeding, spawning, and rearing.
- Reduce dispersal of juvenile fish (positively and negatively.)
- Create isolated populations and reduce gene flow between fish populations.
- Limit passage of fish between feeding grounds.
- Cause fish to congregate at a barrier leaving them open to disease or predators.
- Create unsuitable living or breeding conditions.
- Cause the extinction of upstream or downstream migrating species.
- Alter species diversity because of the local disappearance of some species and changes to the abundance of remaining species.

## Fish Passage Progress/Status Checklist

- Funds have been requested or staff assigned to conduct reviews (specify which) of all Service facilities (specify name of facilities) in geographic area X (specify) to identify potential fish passage problems. (Yes/No, with dates)
- Staff have been assigned to carry out, and/or funds requested for, further analysis or feasibility study preparatory to design of corrective action. (Specify which. ) (Specify fund source and date.)
- Project dollars to design and implement corrective action have been requested. (Specify fund source, and date.)
- Corrective action implemented. (Yes/No, and date)
- Staff have been assigned to carry out, and/or funds requested for, evaluation of implemented corrective action. (Specify which, and date.) (Specify fund source.)
- Evaluation of implemented corrective action has been carried out, with these findings and follow-up actions needed, if any. (Specify date):
  - 1.)
  - 2.)
  - 3.)
  - Etc.

## APPENDIX G

### Categories of Immediate Needs

#### General Survey and Habitat Assessment Needs

- Assess conditions (species and habitat) in streams in which restoration actions have been implemented. (Willapa NWR)
- Conduct species surveys and habitat assessments in areas open to the Columbia River (Gee Creek, Campbell Lake and Slough, Post Office Lake). (Ridgefield NWR)
- Conduct species surveys and habitat assessments in all backwater areas, especially at the mouth of McCormack Slough if any action to open slough is taken. (Umatilla NWR)
- Baseline information for aquatic species occurrence and habitat assessment throughout NWRs (Bandon Marsh NWR, Siletz Bay NWR, Nestucca Bay NWR)
- Information on salmonid presence, life stages, life histories, age structure, and use of refuge waters. (Tualatin NWR)
- Conduct biological inventory and review existing data in preparation for working on the CCP. (Malheur NWR)

#### General Technical Assistance

- Review report on survey of fish barriers and determine how to address sites found to be problems. (Willapa NWR)
- Support for establishing regional reference sites for monitoring species composition and habitats in sloughs not directly affected by dikes and tidegates. (Lewis and Clark NWR)
- Assess potential effects of dredge spoils and bird predation on juvenile salmonids and their habitat. (Lewis and Clark NWR)
- CRFPO participation in floodplain restoration planning. (Steigerwald NWR)
- Assess potential effects of predation by terns on juvenile salmonids at the Blalock Complex and Long Lock Island. Riparian habitat work currently being conducted may attract birds. (Umatilla NWR)
- Provide technical assistance for data analysis and reporting for previous restoration projects (e.g., Millport Slough 100 acres in 2003). (Siletz Bay NWR)
- Greatest short-term need is technical assistance in analyzing raising Scoggins Dam. (Tualatin River NWR)
- Water temperature information for wetland management. (Tualatin River NWR)
- Monitoring program to assess functioning of water control structures relative to juvenile salmonid movement. (Tualatin River NWR)
- Assist with interpretation and use of information on Oregon chub population genetics. (Willamette Valley NWRs)
- Technical assistance for water quality monitoring. (Willamette Valley NWRs)
- Carp control in Malheur Lake when it dries up (i.e., remove carp and screen off Silvies River drainage). (Malheur NWR)
- Evaluate restoration of Blitzen River habitat. (Malheur NWR)

- Technical information regarding rainbow trout stocked by the state in Krumbo Reservoir and effects on redband trout. (Malheur NWR)

#### NWR-Specific Survey and Habitat Assessment Needs

1. Assess habitat conditions and species composition in sloughs to evaluate strategies for modifying existing tidegates and opportunities to create sites for fish passage. (Julia Butler Hansen)
2. Continue monitoring chum salmon and assess habitat restoration opportunities. (Pierce NWR)
3. Conduct comprehensive pre-construction monitoring (species composition and distribution, habitat assessment) for 430-acre restoration project planned for 2007. (Bandon Marsh NWR)
4. Conduct pre-construction monitoring (species composition and distribution, habitat assessment) for 88-acre restoration project planned for 2006. (Nestucca Bay NWR)
5. Technical assistance in designing and implementing a study to develop approaches to control carp in the basin that benefits redband trout and other native species. (Malheur NWR)
6. Conduct species surveys and habitat assessments to describe current conditions and provide information for assessing introduced species and effects of feral horses. (Sheldon/Hart Mountain NWRs)

#### Issue-specific need

7. Conduct surveys of potential fish passage barriers on Service lands in Oregon (excluding the Klamath River basin), and sites not associated with structures on Service lands in Washington (e.g., mouth of Gee Creek at Ridgefield NWR). (locations in Oregon: all NWRs, Service hatcheries—Warm Springs, Eagle Creek, LSRCP hatcheries—Irrigon, Lookingglass, Wallowa)

#### Needs outside CRFPO purview

- Support Columbia River Land Trust in acquiring land adjacent to refuge. (Julia Butler Hansen)
- Testing of shallow wells for water supply. (Tualatin River NWR)
- Funding for fish screens, and continued screening of carp in Blitzen Valley and Double O. (Malheur NWR)
- Obtain spring water rights in Double O. (Malheur NWR)