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**NOAA's National Marine Fisheries
Southwest Regional Office**

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Activities in the Klamath River Basin

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General Background:

The NOAA Restoration Center plans, implements, and funds coastal restoration projects throughout the United States. Within the Klamath Basin restoration projects include fish passage barrier modifications, sediment stabilization, and invasive species removal. These projects increase accessibility, and improve river habitat for species protected under the endangered species act. In total since the Restoration Center has been involved in the Klamath, and in partnership with various organizations, 65 acres of habitat have been restored and 30.6 miles of stream have been reopened for anadromous fish.

Projects Funded in the Klamath River Basin by NOAA's Restoration Center:

Fiock Dam Removal Project:

The Shasta River is an important tributary in the Upper Klamath River Watershed in Northern California. Fiock Dam, a summer flashboard dam, had created a 5 acre pond that was lethal to salmonids due to increased temperatures and nutrients. In addition, the dam presented a barrier to salmonid migration in the Shasta River. The Shasta River [CRMP](#) removed Fiock Dam to improve fish passage and reduce stream temperatures for fall chinook and coho salmon. The project also replaced an unscreened water diversion, associated with the municipal water supply for the area, with a new water intake valve, pump system, and fish screen. The project opened salmonid access to over 10 miles of spawning and rearing habitat in the Shasta River. Other contributions to this project were made by [US Fish and Wildlife Service](#), CA [Dept of Fish and Game](#), [Natural Resources Conservation Service](#), [Bureau of Land Management](#), [US Environmental Protection Agency](#), [Klamath River Basin Fishery Task Force](#) and representatives of the three irrigation districts using the river.

Moon Creek Barrier Modification:

Moon Creek is a tributary to Ah Pah Creek in the Lower Klamath River Basin. Moon Creek supports runs of coho salmon and steelhead. The goal of the Moon Creek Barrier Modification Project was to improve fish passage and instream habitat in Moon Creek by Improving four partial anadromous fish barriers. The California Conservation Corps installed boulder weirs at four culvert road crossing sites to improve passage through the metal pipe culverts. The barrier removals provided access to more than 1/2 mile of spawning and rearing habitat for salmonids. Project Partners included the California Conservation Corps, The NOAA Restoration Center, local landowner and the California Department of

[NOAA's Restoration Center](#)

[Anadromous Fish Conservation Act Grant Program Projects](#)

Current Projects:

Restoration Project Summaries:

- [Fiock Dam](#)
- [Moon Creek](#)
- [Irving Creek](#)
- [Salmon River](#)
- [Parks Creek](#)
- [Terwer Creek](#)
- [Mid-Klamath River](#)
- [Soldier Creek](#)
- [Deadwood Creek](#)

Pictures:

Fish and Game.

Irving Creek Sediment Stabilization:

Irving Creek is a tributary to the Mid Klamath River in Coastal Northern California, and is an important stream for chinook and coho salmon and steelhead. The NOAA Community-based Restoration Program awarded the Karuk Tribe a grant to improve instream spawning and rearing habitat for salmonids. Karuk tribal and other community members implemented the road decommissioning project along Irving Creek in the Six Rivers National Forest, California. The project involved the use of proven decommissioning methods to remove unstable fill at stream crossings and to reestablish the natural hill-slope drainage pattern along the entire road. This road decommissioning project stabilized over 10,000 cubic yards of fill material over several miles of previously unstable and highly erosive road. This project will greatly improve water quality and spawning habitat in Irving Creek, which is a tributary of the Klamath River and supports runs of steelhead trout, Chinook salmon and threatened coho salmon. Road decommissioning projects are vital in forested areas that have high road densities because these roads may be prone to failure and have increased erosion rates and landslide potential. Such protective measures are even more critical in regions that have degraded habitat, naturally high erosion rates, and a presence of threatened species. These factors made this a high priority project. The project was completed during the summer and early fall of 2004, with site vegetation monitoring occurring through pre- and post-excavation photo-points and periodic field visits. Other partners on this project include the Bureau of Indian Affairs, US Fish and Wildlife Service, the Redwood Community Action Agency, and other local watershed volunteers.

Salmon River Cooperative Noxious Weed Program:

The Salmon River is a tributary to the Klamath River Basin and is important spawning and rearing habitat for coho salmon and steelhead. Several species of invasive knapweed had invaded the Salmon River riparian areas and had spread throughout the watershed. This invasive knapweed was preventing riparian vegetation from regenerating along the stream edges, and was reducing habitat quality for fish and wildlife in the River. The Salmon River Restoration Council worked with local community volunteers to successfully eradicate knapweed from the Salmon River Watershed. This involved many hours of mapping and actual removal of the knapweed species. The project was successful, and the community is continuing to identify and remove any new populations of knapweed that recolonize the watershed. Project partners included the Salmon River Restoration Council, local community volunteers, the California Department of Fish and Game, the NOAA Restoration Center and the National Fish and Wildlife Foundation

Parks Creek Fish Passage Restoration:

The NOAA Community-based Restoration Program partnered with American Rivers and the Shasta Valley Resource Conservation District to fund the Parks Creek Fish Passage Restoration project. The objective of this project was to restore fish passage for adult and juvenile salmon and steelhead to 14 miles of Parks Creek upstream of Interstate 5 where access had been limited by a low flow concrete crossing. It allowed adult fish to access extensive spawning habitat and allow juveniles to pass above this point as summer approaches to access cold-water refugia areas in the headwaters of Parks Creek. It also enabled access to essential rearing habitat that aids in the growth of population of Coho, Chinook and steelhead in the Klamath River basin. Among many other organizations, contributions were made to this project by [US Fish and Wildlife Service](#), CA [Dept of Fish and Game](#), and [CalTrans](#).

Terwer Creek In-stream and Riparian Restoration Project:

Terwer Creek is a tributary to the Lower Klamath River, near its estuary in coastal Northern California. Terwer Creek supports four species of salmonids, coho and chinook salmon, steelhead and cutthroat trout, and Pacific Lamprey. The lower reaches of Terwer Creek once provided essential spawning and summer rearing habitat for salmonids in the Lower Klamath system. However, the construction of a roadway, past logging practices and other land management have altered the lower reaches of Terwer Creek where there was once abundant riparian vegetation and habitat complexity in the form of Large Woody Debris (LWD). The Yurok tribe helped to restore the lower reaches of Terwer Creek by planting riparian vegetation on the streambanks and in the floodplain, and installing complex LWD habitat structures to provide resting and rearing habitat for fish. Yurok Tribal members were trained to complete the restoration work on their own ancestral land. Other project partners included the California Department of Fish and Game, the NOAA Restoration Center and Green Diamond Timber Co. This project will improve riparian habitat conditions and restore stream channel and streambank stability in lower Terwer Creek (EFH).

Mid-Klamath River Watershed Restoration Project:

The Karuk Tribe Ancestral Territory is in the Mid Klamath River Basin and encompasses portions of the Salmon River and Tributaries to the Mainstem Klamath. These areas are important spawning and rearing habitat for coho and chinook salmon, steelhead and Pacific Lamprey. In addition, tributaries to the Mid-Klamath provide refugia from temperature and disease that is present in the warmer waters of the mainstem Klamath River. The Karuk Tribe worked with the US Forest Service to remove and decommission over 11 miles of paved road in the Six Rivers National Forest. Karuk tribal members operated heavy equipment to remove the road, all stream crossings and replant disturbed areas with native plant species. The road removal will reduce fine sediment delivery to Steina cher Creek and the Salmon River, which will help improve spawning habitat, rearing productivity and will help reduce water temperatures in the Salmon River. Project Partners included the Karuk Tribe of California, the NOAA Restoration Center, the US Forest Service, Fish and Wildlife Service, the State Water Resources Control Board were also partners and the Northern California Indian Development Council.

Soldier Creek Fish Passage Barrier Removal:

Soldier Creek is a tributary to the Trinity River, which flows into the Klamath River Basin in Northern Coastal California. Soldier Creek contains excellent habitat for coho salmon and steelhead. Two County Road Culverts on Soldier Creek were preventing salmon and steelhead from reaching 2.1 miles of habitat upstream of the crossings in Soldier Creek. The Trinity County Planning Department worked with the Trinity County Department of Public Works to replace both crossings with clearspanning open bottom arch structures. The newly constructed crossings provided unimpeded fish passage and will reduce roadway flooding and maintenance because they will pass flood flows and debris more easily. The project was a win-win for the County and salmonids for these reasons. Project partners included the Five Counties Salmonid Conservation Program, the Trinity County Department of Public Works, the NOAA Restoration Center, the California Coastal Conservancy, the California Department of Fish and Game, American Rivers and the National Fish and Wildlife Foundation.

Deadwood Creek Migration Barrier Removal:

Deadwood Creek is a tributary to the Trinity River, which flows into the Klamath River Basin in Northern Coastal California. Deadwood Creek contains excellent habitat for coho salmon and steelhead. A County Road Culvert on Deadwood Creek was preventing salmon and steelhead from reaching 4 miles of habitat

upstream of the county crossing on Deadwood Creek. The Trinity County Planning Department worked with the Trinity County Department of Public Works to replace the barrier culvert a clearspan bridge. The newly constructed crossing provided unimpeded fish passage to upstream spawning and rearing habitat and will reduce roadway flooding and maintenance because flood flows and debris will pass through the crossing more easily. The project was a win-win for the County and salmonids for these reasons. Project partners included the Five Counties Salmonid Conservation Program, the Trinity County Department of Public Works, the NOAA Restoration Center, the California Coastal Conservancy, the California Department of Fish and Game and the National Fish and Wildlife Foundation.

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Top Constituent Concerns & Responses

The following concerns were brought to NOAA Fisheries Services attention regarding the Klamath River Basin Activities, by local constituents.



- [1. Parasite Science](#) – How is NOAA Fisheries Service addressing parasites and engaging in the scientific work in this area?
- [2. Funding for Disaster Relief](#) – What is the status of funding for the fishery failure declared in August 2006?
- [3. Biological Opinions/ National Academy of Sciences](#) – Is NOAA Fisheries Service sufficiently incorporating advice from the National Academy of Sciences and are we incorporating new science?
- [4. Marine Mammals](#) – What can be done to address Sea Lions eating salmon in these areas?
- [5. Counting Fish](#) – How does NOAA Fisheries 'count' fish? Should hatchery fish be included?
- [6. Moving fish from lower river to upper river](#) – Should fish be moved from the lower river to tributaries where there is less disease? If so, how? Do silted entrances to tributaries need to be cleared?
- [7. Real Time analysis of catch](#) – How is NOAA Fisheries Service moving towards 'real time analyses' to monitor origin of fish in the ocean harvest e.g. rapid DNA assessment techniques?
- [8. Flow Rates](#) – should there be strategic times of year water is released or should the flow rate requirements be year round?
- [9. Multi-agency Watershed Agreement](#) - How can this agreement be used to address the issues in the basin. Should the agreement be revisited?
- [10. Operations at Iron Gate Dam](#)

NOAA Fisheries Service [Disaster Relief Amendment 15](#)

[Scientists use Genetic Techniques to Identify Chinook Salmon in Fisheries](#)

Up coming Meetings

Pacific Fishery Management Council [2007 Council preseason planning process schedule](#)

Other Organizations [Natural Resources Conservation Service](#)

[Bureau of Reclamation](#)

[Salmon River Restoration Council](#)

Parasite Science --

NOAA Fisheries Service has funded research to investigate the effects of fish disease on Klamath Basin salmonids. In response to observations of infectious disease in Klamath River Basin salmon, NOAA Fisheries Service has collaborated with other federal agencies, state agencies, tribes, and stakeholders, to develop strategies to investigate and combat fish disease. Since 2005, NOAA Fisheries Service, along with

the US Fish and Wildlife Service (USFWS) has convened Klamath River fish health workshops which have served the scientific community with a forum for developing research and monitoring strategies, as well as informing management on ways to improve salmon survival. NOAA Fisheries Service, in partnership with USFWS was convened the Klamath River fish health workshop in February, 2007.

- [Briefing](#) on the 3rd Annual Klamath River Salmon Disease Conference

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Funding for Disaster Relief --

In the first two days of the new legislative session, two companion bills were introduced, that if passed, would authorize the appropriation of \$60.4 million for California and Oregon's fishermen, tribes and businesses impacted by the commercial fishery failure declared in August 2006 by Commerce Secretary Carlos Gutierrez.

S.145.IS authored by Sen. Barbara Boxer (D-CA) on 1/4/2007, Referred to the Senate Committee. Status: Read twice and referred to the Committee on Commerce, Science, and Transportation.

HR 234 IH authored by Rep. Mike Thompson (D-CA) on 2/7/2007, Referred to the House subcommittee. Status: Referred to the Subcommittee on Fisheries, Wildlife, and Oceans.

To review the bills go the [Library of Commerce](#) search engine and reference the bill identification (in red above). We apologize for the indirect link.

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Biological Opinions/National Academy of Sciences --

NOAA Fisheries Service fully incorporated the advice of the National Academy of Sciences in the Biological Opinion (BO) issued on the operations of the Klamath Reclamation Project. NOAA Fisheries Service and the [Bureau of Reclamation](#) will reinitiate consultation under section 7 of the ESA and will incorporate the best available scientific information available during that consultation. New information has been developed through scientific research and through the evaluation of the information gathered in monitoring the results of operating the project under the standards established in the current BO. One key long-anticipated science contribution that is undergoing review is a thorough examination of the influence of various flow levels on the availability of fish habitat in the Klamath River.

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Marine Mammals --

NOAA Fisheries Service undertook cooperative studies with the Yurok Tribe on sea lion predation on salmon in the Klamath River in 1997-1999. The studies demonstrated that California sea lions were consuming about 10 percent of the returning fall Chinook. As a result of this and other salmon predation studies on the west coast, NOAA Fisheries Service recommended to Congress that the Marine Mammal Protection Act (MMPA) be changed to allow state and federal authorities to more effectively deal with site-specific situations of salmon predation by California sea lions and Pacific harbor seals. To date, no changes have been made to the MMPA, and the deterrence measures allowed under the MMPA have been largely ineffective in addressing sea lion predation on salmon on the west coast.

- Learn More about [Non-Lethal Deterrence Measures](#)

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Counting Fish --

The NOAA Fisheries Service accounting practices for natural and hatchery-origin fish are consistent with provisions of the Pacific Fishery Management Council's (Council) Pacific Coast Salmon Fishery Management Plan (Salmon Plan), and long-standing past practice of the Klamath River Technical Advisory Team. Ocean salmon fisheries are managed to achieve a spawning escapement goal of 33-34 percent of the potential, naturally-spawning adult fall Chinook in the Klamath-Trinity Basin. That goal also specifies that the escapement should not fall below a floor of 35,000 natural spawning fish. Each year agencies cooperate in forecasting the abundance of Klamath fall Chinook including a forecast of the percentage of spawners that will return to the Basin's two hatcheries.

The reason for distinguishing hatchery and natural area spawners is to ensure the continued wild production of Klamath fall Chinook in river habitat outside the hatcheries.

The Basin's natural area sub-stocks are considered vital for maintaining the genetic diversity, productivity, and spatial structure of this resource. Runs of hatchery salmon can sustain a greater harvest rate than runs of naturally reproducing salmon. Combining the hatchery and natural spawning goals, therefore, would increase the risk of seriously depleting or even extirpating certain natural area subpopulations and thereby reducing the long-term productive potential and viability of the overall stock composite.

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Moving fish from lower river to upper river --

NOAA Fisheries Service is working to open more upstream

habitat to salmon and steelhead through the process of requiring effective fish passage past the dams on the mainstem Klamath. We are pursuing this objective under the Federal Energy Regulatory Commission relicensing of the hydroelectric facilities. [Learn More](#).

The question of what interventions would help to reduce the mortalities due to disease – such as moving fish from the lower river to the upper river—was considered at the [3rd Annual Klamath River Salmon Disease Conference](#). In the future, the health and productivity of lower river tributaries will be essential to restoring the full productivity of the Klamath River. Regarding sediment barriers to fish entering and leaving tributaries, this is a question of achieving appropriate channel forming flows within the tributaries and the main stem Klamath.

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Real Time Analysis of catch --

NOAA Fisheries Service is currently working with the Pacific Fishery Management Council and the States of California and Oregon to evaluate the application of genetic stock identification (GSI) technologies to Pacific coast salmon fisheries management. A pilot project conducted in 2006, which collected DNA samples from a limited area, provided some preliminary information on the lab processing time required for genetic stock identification, as well as some of the logistical requirements in conducting such a sampling program. A program proposed to begin in 2007 would be designed to determine the spatial-temporal distribution of Klamath River fall Chinook (KRFC) as well as other stocks of concern off the coasts of Oregon and California, and would include an investigation of the potential differences in KRFC contact rates in near-shore versus off-shore waters. It is too early to apply GSI technologies “real-time” to West Coast salmon fishery management, but NOAA Fisheries Service and the Council may consider a pilot study for applying GSI sampling to determine in-season stock composition of catch in a limited area fishery in 2007. Real-time GSI-based technology will yield a different type of harvest metric than currently being used, and if implemented too quickly without due consideration of impacts on management objectives and forecasting methods could cause fishery disruptions. The proposed GSI program for west coast salmon fisheries is contingent upon sufficient funding.

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Flow Rate --

Flow rates under the NOAA Fisheries Service Biological Opinion (BO) are adjusted throughout the year to achieve the greatest benefit for ESA listed coho salmon. Higher flows are required in the spring to support outmigration of juvenile salmon and in the fall to aid in the upstream migration of

returning spawners. The absolute level of those flows varies with the amount of water available in the basin each year. Another flow consideration that is emerging is the need for very high flows that often occur in the winter and spring and that spill uncontrolled by the dams. These high flows are necessary for the forming and maintenance of river channel features critical to salmon habitat. The flow studies commissioned by the Department of the Interior and now under final review will provide additional scientific guidance in managing flows in the Klamath for the benefit of salmon.

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Multi-Agency Watershed Agreement --

The landmark October 13, 2004 agreement among four cabinet-level federal agencies, and the governors of Oregon and California establishes federal and state commitments to future collaboration and cooperation in the entire Klamath Basin watershed as they work together to resolve complex water quantity, water quality, and fish and wildlife resource problems. The agreement commits to establishing a coordinated approach to implement a long-term management approach for restoration, a common vision, and integrated planning to enhance fish runs and protect habitat while providing water for irrigation and other uses. Co-chaired by representatives from the governors' offices and including regional directors from federal agencies, a "working group" to implement the agreement was also established under the agreement in 2004. In 2005, the working group decided to direct its resources to settlement discussions associated with [FERC consideration of PacifiCorp hydropower license](#). Settlement discussions have brought Tribes, fishing interests, agricultural interests, environmental organizations, Federal, state and local governments together for the first time. The agreement should be revisited once the settlement discussions advance over the next 6 months.

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Operations at Iron Gate Dam --

Flow releases at Iron Gate Dam are managed according to a biological opinion (BO) issued by NOAA Fisheries Service. The flow release operations under the BO are calculated to provide the necessary protections for the Endangered Species Act (ESA) listed coho salmon in the Klamath River and are not designed specifically to protect Chinook salmon, which are not listed under the ESA.

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