

Upper Klamath Basin Business Plan

Executive Summary

Conservation need: Two culturally significant fish that are endemic to the Upper Klamath Basin and that are now listed as federally endangered, the shortnose sucker and Lost River sucker, and a functional redband rainbow trout population, now recognized as “vulnerable” by the Oregon Department of Fish and Wildlife, are the focus of this Keystone Initiative.

All three species are adfluvial, meaning that they migrate from Upper Klamath Lake to spawn in its tributaries including the Wood, Williamson, and Sprague Rivers. This complex life history presents major challenges to recovery efforts. Therefore, this Initiative takes a watershed-scale, multi-dimensional approach on improving habitat conditions for the fish. It also explicitly addresses local socio-economic factors related to water use and riparian corridors management — vital considerations because success largely depends upon effective conservation actions accomplished on private lands.

Extensive modification to the landscape for agricultural purposes has occurred throughout the Upper Klamath Lake watershed over the last century. These activities have reduced habitat available to fish and increased nutrient loading to tributaries and Upper Klamath Lake resulting in degraded water quality throughout the basin. Some portions of the Upper Klamath Lake basin do not currently support healthy populations of endangered suckers and redband trout, and monitoring data indicate that these species are at dangerously low numbers and not increasing.

Performance targets: The overall goal of this Initiative is to restore the watershed to conditions that support increased geographic and seasonal distribution and abundance of juvenile and adult Lost River sucker, shortnose sucker, and redband rainbow trout. Ultimately, the goal is to increase sucker populations to the extent that these fish can be removed from the Endangered Species List. Further, activities described in this plan aim to improve the distribution, abundance, and productivity of certain redband trout populations from the current “fail” status to a “pass” status following Oregon Department of Fish and Wildlife (ODFW) guidelines.

Accurate fish population size estimates are difficult to ascertain and compute for long-lived species with delayed breeding, particularly when those species dwell in a water body the size of Upper Klamath Lake. Individual fish of both sucker species can live for 30 to 40 years and reach sexual maturity when they are five to seven years of age. Therefore, it is important to track several population metrics, including the rate of population change, annual survival and average life span of adults, and recruitment.

For the two suckers, the goal of this Initiative is to provide conditions that facilitate consistent population growth, annual survival rates consistently above 0.8, and recruitment increased from current levels in both species for a ten-year period beginning in 2015. During the next ten years, we expect to see increased distribution and abundance of juvenile suckers in the Sprague River, and increased year-round use of the Sprague River by adult suckers over the next ten years.

The goal for the redband rainbow trout is to change the Oregon Department of Fish and Wildlife’s assessment from “fail” to “pass” in: *productivity* for four of the five failing communities; *abundance* in two of the three failing communities; and *distribution* in one of the two failing communities by the year 2018. Measurable indications of success include expanding summertime distribution and abundance of juvenile and adult redband trout using enhanced and expanded refugial areas.

It is important to note the time delay between restoration activities and measurable changes in watershed-scale population size. Therefore, this effort will also track changes in Ecological Stressors (see Logic Model, Figure 5) which can serve as surrogate indicators known to impact the species, such as, miles of stream with stable riparian areas, changes in water temperature, increased flows, and others.

Key partners: The Klamath Basin Rangeland Trust, Klamath Tribes, Klamath Watershed Partnership, The Nature Conservancy, Sustainable Northwest, US Fish & Wildlife Service, US Bureau of Reclamation, USDA Natural Resource Conservation Service, Oregon Department of Fish & Wildlife, Klamath Soil & Water Conservation District, and Ducks Unlimited, U.S. Geological Service.

Major threats include: Land use alterations, socioeconomic concerns, and altered hydrologic regimes are the key threats. Tens of thousands of acres of emergent wetlands adjacent to Upper Klamath Lake have been diked and drained and extensive reaches of tributaries were straightened and riparian vegetation removed or severely degraded due to grazing. Destabilized stream banks eroded and transformed narrow, deep channels to wide, shallow waterways choked with fine sediment, in which summertime temperatures soar. Historic and current irrigation practices divert water from streams reducing availability for fish at various times throughout the year. Irrigation diversion structures impede or prevent fish passage and access to quality habitats and entrain fish in irrigation systems. Springs that once provided spawning habitat and contributed cold, clean water to the rivers are degraded and separated from the stream channels. Diking and channelization to prevent flooding and increase irrigation efficiency contributes to erosion and altered the historic structure, function, and hydrology of the river.

It is critical to note that nearly all of the restoration that needs to be done is on private land. Land and water use choices must be aligned with conservation strategies and conservation actions must dovetail with what is primarily an agricultural economy on target lands. It is imperative that those landowners become willing partners in restoration. Significant work since 2001, much of it supported by the Foundation, has built a strong foundation but more work needs to occur in the following priority areas.

Implementation plan, key strategies, and annual budget: The two primary strategies of this Initiative, 1) habitat restoration and conservation, and 2) water use management, will directly address three major threats: 1) land use alterations; 2) socioeconomic concerns, and 3) altered hydrologic regimes. These two primary strategies are complemented by two support strategies, which include 1) strategic planning and 2) coordination and the use of targeted research and experimentation.

There has been significant effort and progress toward restoring and conserving habitat in the last decade. Federal and state natural resource agencies will continue to contribute to restoration project implementation. The strategies in this initiative will make restoration more effective and speed recovery of the fish, not only by contributing toward restoration projects, but in two other very significant ways: 1) enhancing coordination among conservation and restoration partners in planning, research, monitoring, funding and implementation, and 2) incorporating the local economic and land use needs so that landowners become willing partners in restoration. In this way the Foundation plays a critical role in this process. Ultimately, this will lead to a smart and coordinated approach to recovery of the shortnose and Lost River sucker and redband trout.

Primary Strategy 1. Habitat Restoration and Conservation

Many key habitats historically present are either not available or degraded, and restoring, and conserving these habitats is essential

Private landowners, with the support of non-governmental organizations, the Klamath Tribes, and state and federal agencies have made substantial, successful efforts to restore lost or degraded habitats. These partnerships have more recently coalesced around the potential to contribute to a basin-wide Klamath Basin Restoration Agreement (or "Klamath Settlement"), and there is now a credible opportunity to extend these habitat restoration efforts through these systems.

Primary habitat restoration activities include:

- Restore and improve ecological condition of riparian habitats, floodplain wetlands and geomorphic stream processes through fencing stream-side corridors, levee removal, channel reconstruction and changes in land management practices on 80 miles of Sprague River and 25 miles of Wood River and key tributaries.
- Restore natural hydrologic function at 20+ cold-water springs and seeps throughout system by fencing and elimination of hydrologic alternations
- Restore spawning and rearing habitat and re-establish connectivity of migratory corridors for redband trout and bull trout in 50 miles of tributary streams in Wood River system, including Fourmile and Sevenmile streams.
- Remove barriers to fish passage, and screen all unscreened diversions > than 30 cfs in Sprague River and Wood River valley systems.
- Designate approximately 80 stream miles and 20,000 acres of riparian and floodplain wetlands in conservation status through agreements with private landowners

Primary strategy 2. Water Use Management

Lost River suckers, shortnose suckers, and redband trout are all impacted by limited water availability and degraded water quality. Revising water resources management in the upper Klamath Basin is imperative to provide the water needed for agricultural, Tribal, and fisheries interests.

There are two priority activities in the Water Use Management strategy: 1) Initiative partners will begin developing the water transaction program (with actual transactions occurring after the program is in place), and 2) begin working with landowners and stakeholders to develop management agreements related to water balance and restoration. Alternate irrigation strategies and the development of large-scale restoration projects will be ongoing efforts.

Opportunities for new management strategies include developing & implementing a water allocation plan that settles outstanding resource conflicts above Upper Klamath Lake; establishing a water transaction program to allow for water right leasing and transfers; creating a hydrologic model that guides how and from where water is moved from agriculture to fishery needs; working with private landowners to modify water management and improve irrigation efficiency in ways that consider long-term maintenance and economic impacts; and determining larger scale strategies, including lake-level management and increased storage, that would result in a water balance between agriculture and fisheries.

All water management activities will be undertaken in the context of the "Klamath Settlement" talks that resulted in a Basin-scale hydrologic model.

Investment in the following two Support Strategies is in a sense an even more critical role for the Foundation. First, federal and state natural resource agencies have contributed and will continue to contribute a large portion of the funding for on-the-ground projects. To be most effective, however, agency' efforts must fit into a more comprehensive, coordinated strategy, and targeted research and monitoring is required to ensure that restoration investments actually yield the desired biological outcomes. We must also more finely tune conservation strategies to local socio-economic circumstances. We therefore propose the following two Support Strategies:

- Integrated Strategic Planning & Coordination: the Foundation will work with Basin partners to prioritize the biophysical recovery needs of the fishes, integrate socio-economic impacts on landowners, clarify roles and coordinate resources for implementation.

- **Research, Experiments and Knowledge Gaps:** The above planning process will help identify knowledge gaps critical to recovering the species. The Foundation will work with partners to design and conduct research and experiments as needed.

Significant ancillary benefits: Measurable benefits to a suite of native fish with distributions that overlap with the target species are expected, including Klamath largescale sucker, lamprey, bull trout, tui chub, blue chub, and eventually anadromous fish species when they are re-introduced as planned. Species dependent on wetlands and riparian ecosystems, including but not limited to Oregon spotted frog and migratory birds for which the Klamath Basin is renowned, will benefit. Beyond species-specific benefits, results of this initiative will restore conditions that improve ecosystem services and watershed processes that will improve water quality and ecosystem function throughout the Upper Klamath Lake drainage.

NFWF financial leadership: The Foundation is being asked to provide approximately \$9.7 million over the 10-year life of this Initiative.