A CONSERVATION VISION FOR THE KLAMATH BASIN

> *"Nowhere in America is there a better opportunity to restore an entire river system."*
> -- Tim Palmer, author of *Wild and Scenic Rivers of America*, on the Klamath River.

The Klamath Basin Coalition and Its Vision

The Klamath Basin Coalition is an alliance of local, regional and national organizations dedicated to conserving and restoring the Klamath Basin. The members of the Coalition have pledged to work together to promote and implement the vision and actions presented here. We invite constructive feedback from all interested parties and invite other organizations to endorse this document and to join our Coalition.

Our vision is to restore a health, naturally diverse and productive Klamath Basin ecosystem by re-establishing, to as great a degree as feasible, sustainable natural hydrological conditions and ecological functions throughout the entire basin. This can be accomplished through a comprehensive ecosystem restoration program that also takes into consideration and allows us to live within the basin's natural limitations on rainfall.

Like most places in the West, the Klamath Basin is naturally arid and rainfall is very limited. Decades of state and federal agency failure to live within (or even recognize) water limits in this arid basin has been the source of most of the conflict and controversy in the region. Federal and state water policies have promised to deliver far more water than actually exists. This tragic institutional failure has pitted one group against another unnecessarily. There is room for everyone in the Klamath Basin if we learn to live within the natural limits of the available water.

The goal of the Coalition's efforts is to restore "normative" conditions, under which ecological processes once again occur within their natural patterns of variation, throughout the Klamath Basin. This does not mean restoring the basin to pre-settlement conditions, which would be impossible, but it does mean making sure that all natural ecosystems still function in a way that creates a sustainable balance with human uses, and that optimizes ecosystem benefits to all the inhabitants of the region.

Viable and self-sustaining populations of native species should be restored to the basin. Salmon stocks in the Klamath River should be restored to a level that not only satisfies the requirements of the Endangered Species Act but also fully supports Native American

Tribal rights, and the important commercial and sport fishing economies of river and coastal communities in Oregon and California.

Ecological restoration in the Klamath Basin can help ensure and maintain a healthy economy and a high quality of life in the region. The Klamath River Basin should support vibrant Native American, sport and commercial fishing, and wildlife/wildland-oriented recreational opportunities. It should also support all the economies that depend on these precious natural resources.

The Klamath Basin can and should also support a healthy and diversified agricultural economy that is ecologically sustainable. Wasteful water use and water over-appropriation hurts farmers more than anyone, creating massive uncertainty and economic instability in farming communities already hard pressed to compete in global markets. Farmers will also benefit more than anyone from well thought out conservation and restoration measures that make better use of the basin's limited water supply and bring the demands on that supply back into balance with the water actually available. The past water policies that pit farmer against farmer, farmer against fisherman, and upper basin against lower basin are no longer acceptable.

To the extent possible, the basin's affected individuals and their families must also be helped through the necessary economic transitions so that they can move forward toward a viable and productive as well as sustainable basin economy. The burden of change should be borne by the state and federal agencies who caused the problem, not by its economic victims.

Restoration efforts must also comply fully with the Endangered Species Act, the National Forest Management Act, the Clean Water Act and all other applicable environmental laws as well as satisfy all responsibilities to Native American Tribes. These laws protect the most valuable economic assets of the basin – its natural resources.

The Klamath Basin

The Klamath Basin is one of the nation's great ecological treasures. Considered a "western Everglades," this area in northern California and southern Oregon once contained some 350,000 acres of shallow lakes, freshwater marshes, wet meadows and seasonally flooded basins. The 254-mile long Klamath River was also among the most productive salmon rivers in the west. Lakes and streams in the upper Klamath Basin contained great populations of qapdo and c'wam (i.e., shortnose sucker and Lost River sucker) and spring-run chinook salmon. These fish provided a major food source for Native Americans and many of the early European settlers. Early white explorers to the basin were also astounded by spectacular concentrations of ducks, geese, swans, grebes, pelicans and other birds. Trappers with the Hudson Bay Company harvested beaver, otter, marten and other fur-bearing animals there. Salmon were a major food source for the lower river and later supported many canneries.

Damming and diversion of rivers, and draining of wetlands in the upper river basin, has taken an enormous toll on the Klamath Basin's ecology and wildlife as well as a once robust lower river fishing economy. More than 75 percent of the basin's wetlands have been drained and converted to agriculture. Logging, grazing, fire suppression, road construction and other factors have also greatly impacted the area's ecology. The hydrology of the Klamath River and related streams and lakes has been dramatically altered and water quality has been severely degraded. The Klamath Basin is an arid basin in which rainfall is limited. Much of the basin's water is now over-appropriated, which means there are more legal permits to take water than there is total water available. Water demand in much of the basin now far exceeds supply, with fish and wildlife needs generally given lowest priority.

Klamath River coho salmon are now listed as a federally protected threatened species and the c'wam and qapdo are listed as endangered. Waterfowl and other migratory bird numbers have declined dramatically. In many years, water quality from the Upper Klamath has been so poor that salmon runs far downstream have been destroyed. In September 2002, for instance, the lower river economy suffered through one of the worst fish kills in U.S. history, with more than 34,000 adult salmon unable to reach spawning grounds and dying in a river reduced from its natural flows to a trickle of warm water. An estimated 3,780 fishing-dependent jobs amounting to nearly $80 million/year in total personal income have already been lost from the Klamath Basin economy as a direct result of salmon declines, and a fishery conservatively estimated as worth between $2.6 to $4.3 billion has been placed at risk.

As the Klamath salmon runs declined, fishing jobs from Coos Bay, Oregon to Fort Bragg, California have been severely affected (Figure 2). Hundreds of fishing guides once operated on the Klamath River, and both commercial and sport fishermen supported numerous regional businesses. Coastal ports both north and south of the mouth of the Klamath were once among the most productive salmon fishing ports in the world. With the decline of these fisheries, however, ports and most businesses supported by the fishermen have collapsed or have had to leave the area. Whitewater enthusiasts still use the Klamath River and some in-river fishing still occurs. However, river users often complain about the poor water quality of the river, and those fishing businesses still holding out are at risk

Yet even in its diminished form, the Klamath Basin still attracts nearly 80 percent of the Pacific Flyway's waterfowl and still supports the largest wintering population of bald eagles in the lower 48 states. Salmon still migrate in the lower portion of the Klamath River and enormous trout still reside in lakes and streams. All of the pieces are still there, though in diminished form. The Klamath River Basin can still be restored, and with it much of the region's fishing-based commercial and tourism economy.

Broad-scale ecosystem restoration is also fully supported by the science and scientists, including the National Research Council and the Oregon Independent Multi-disciplinary Science Team (IMST), two blue-ribbon independent science panels who have looked in

depth at the ecosystem problems of the basin. Most of the measures we call for below are also recommended in those scientific reports.

Our vision will be advanced by implementing the actions described below. Many of these actions can be taken cost effectively, with few impacts to existing uses, and will in themselves contribute substantially to the regional economy.

ACTION PLAN

I. RESTORING FISH AND WILDLIFE HABITATS Fish and wildlife habitats throughout the Klamath Basin have been degraded. An array of conservation tools including willing seller acquisition of land and water rights, public land restoration, and conservation easements can and should be used to restore fish and wildlife habitats, improve water quality, increase natural water storage of wetlands, forest, and riparian areas, and help re-establish the normative hydrology of the Klamath River Basin. Many of these mechanisms would fully compensate landowners in the process. The scientists also say that broad-scale restoration is the ultimate answer to ending the conflicts within the basin. The highest priority actions are as follows:

A. Lower Klamath Lake

Actions

1) That portion of the former Lower Klamath Lake which lies north and west of the Lower Klamath National Wildlife Refuge (known as the "Klamath Straits") should be among the highest priorities for purchase and restoration. The goal for this area should be to restore the normative conditions and ecological functions of the area.

2) A more natural hydrological regime should also be restored on lands within the present boundaries of the Lower Klamath Refuge. It may be possible for the refuge to take advantage of peak river flows by flooding a greater area of the refuge in the winter and spring, and allowing the refuge to gradually release some of this water back into the river over the remainder of the year. Restoring Lower Klamath Lake would improve habitat conditions for fish and wildlife, and would also improve water quality, increase natural water storage, and help restore more natural flow cycles in the Klamath River.

3) Commercial agriculture within the national wildlife refuges should be phased out in an equitable manner and refuge lands should be returned to a natural habitat condition.

4) Water quality problems in Lower Klamath Lake should be corrected, and native lake species (including suckers) should be reintroduced once spawning and rearing habitat in the expanded lake has been restored through conversion to suitable wetlands.

Background and Rationale

President Theodore Roosevelt established the Lower Klamath National Wildlife Refuge in 1908 to protect the vast expanses of Lower Klamath Lake and its great flocks of migratory birds. Executive Order 924 set aside 81,619 acres for this purpose. This vast lake/wetlands basin was flooded in the late winter and spring during times of high flow in the Klamath River. The Lower Klamath Lake is thought to have helped "buffer" the annual flows of the Klamath River, storing water during times of peak river flow in the winter and spring and releasing it back into the river gradually at drier times of the year.

In 1918, however, Lower Klamath Lake's connection to the Klamath River was blocked and the great wetlands gradually dried up. As the lake and its marshes receded, encroaching homesteaders established farms on the former lake bottom in what was originally intended to be the refuge. The refuge was then reduced in size by subsequent Presidents down to 46,315 acres. The natural water storage function of Lower Klamath Lake was lost (Figure 3).

The U.S. Fish and Wildlife Service now manages the diminished Lower Klamath Lake National Wildlife Refuge intensively. 4,500 acres are managed as permanent open water, approximating habitat that would have been in the deeper water portions of the former Lower Klamath Lake. 6,700 acres are managed as permanent marsh, inundated year round and covered with permanent vegetation. Approximately 12,000 acres are managed as "seasonal marsh." In order to provide habitat for migratory waterfowl during their fall migrations, these areas are now flooded in the late summer and fall and drained in the spring. Ironically, current management of these seasonal marshes is quite different from how the natural system operated (i.e., the area was thought to have flooded when Klamath River flows peaked between March and June and gradually dried out in the summer and fall) (Figure 4). Some have raised concerns that by removing water from the river at the driest time of year and releasing water back into the river when the river is at its peak flows, current refuge management may be adding to the problems facing the Klamath River.

In addition to the permanent and seasonal wetlands, approximately 6,000 acres of the Lower Klamath National Wildlife Refuge are leased to farmers for commercial agriculture, one of the few places in the country where this is still allowed. The Fish and Wildlife Service has contracts for farming another 4,000 acres with farmers who agree to leave a portion of their crop in the field for wildlife. However, artificially planted waterfowl fodder is much inferior to natural wetlands as a source of food and shelter. Croplands also provide no natural water storage but are net water users. Refuge farming consumes scarce water supplies, broadcasts agricultural chemicals, creates an impediment to natural water storage on the Lower Klamath Refuge, and degrades water quality on the refuge and in the Klamath River.

Like other refuges in the Klamath Basin, the Lower Klamath Refuge suffers from poor water quality and inadequate water quantity. Because the Interior Department has directed that the refuges are last in line to receive water, the Bureau of Reclamation has often reduced water supplies to the refuge in order to maintain water supplies to farmers in dry years. Without adequate water supplies, refuge marshes dry out, threatening

wetlands, wildlife and the bald eagles that feed on them. When wetlands are diminished, waterfowl are forced to crowd into smaller areas, which can increase the probability of bacterial diseases such as botulism and avian cholera. These diseases have been responsible for large numbers of bird deaths on the refuges. Ironically, in some years, scarce water has been used to irrigate commercial crops on the refuges even as refuge marshes have been allowed to go dry.

Lower Klamath Lake was once prime spawning and rearing habitat for the ESA-listed qapdo and c'wam (i.e., shortnose sucker and Lost River sucker), but now those populations have been all but extirpated. Among the many restoration recommendations of the National Research Council's Klamath Committee's Final Report is the expansion of Lower Klamath Lake back into its original lake bed, the restoration of its natural wetlands spawning and rearing habitat for these fish, and the reintroduction of these fish back into their natural habitat.

B. Tule Lake

Actions

1) The normative functions and processes of Tule Lake should be restored to the extent feasible.

2) Commercial agriculture within the refuges should be phased out in an equitable manner and the refuge lands should be returned to a natural habitat condition.

3) Crops planted on the refuge lands such as onions, sugar beets and potatoes, which are of little or no value to wildlife and require particularly toxic pesticides, should be eliminated expeditiously.

4) Water quality problems in Tule Lake should be corrected, and native lake species (including suckers) should be reintroduced once spawning and rearing habitat in the expanded lake has been restored through conversion to suitable wetlands.

Background and Rationale

Tule Lake National Wildlife Refuge was established in 1928. Historically, Tule Lake expanded and contracted dramatically as a result of variations in flow from the Lost River, reaching a maximum size of around 100,000 acres. This pattern of drying and flooding made Tule Lake particularly productive for migratory birds and other wildlife.

Through damming of Clear Lake, diversion of the Lost River, and diking and draining, Tule Lake was reduced drastically in size. In the 1940s, a tunnel was constructed through Sheepy Ridge, connecting Tule Lake with Lower Klamath Lake and enabling the further drying up of Tule Lake.

Tule Lake National Wildlife Refuge is 39,100 acres, although only 13,000 acres are actually remnant lake/marsh. However, the Bureau of Reclamation leases 15,500 acres of the refuge to farmers for commercial agriculture, and the Fish and Wildlife Service has contracts for farming another 2,000 acres with farmers who agree to leave a portion of their crop standing for wildlife. (Figure 3).

The current extent and configuration of lease lands on the Tule Lake Refuge are an impediment to water storage and fluctuation of water levels, and contribute to poor water quality in the Klamath Basin. The crops are treated with pesticides that can kill or sicken wildlife. Row crops (onions, sugar beets, and potatoes), which are of little or no value to wildlife and require particularly toxic pesticides, are allowed on up to a quarter of the refuge leaselands.

Even in this greatly diminished state, however, Tule Lake National Wildlife Refuge was once the most outstanding refuge in the country for migratory waterfowl and other wildlife. Unfortunately, over time artificially stabilized water levels, sedimentation, poor choice of crops grown, and contamination from agricultural run-off and pesticides have degraded the quality of Tule Lake's habitat and reduced the abundance and diversity of its wildlife.

High concentrations of nitrogen, phosphorus, and un-ionized ammonia, low levels of dissolved oxygen, and extreme pH levels are among the many problems that have been identified in the Tule Lake Refuge. According to at least one study, the refuges' water is known to be toxic to frog embryos, resulting in death and malformations. Botulism and avian cholera are also serious problems for the refuges' waterfowl populations.

Tule Lake was also once prime spawning and rearing habitat for the ESA-listed qapdo and c'wam (i.e., shortnose sucker and Lost River sucker), but now those populations have been all but extirpated. Among the many restoration recommendations of the National Research Council's Klamath Committee's Final Report is the expansion of Tule Lake back into its original lake bed, the restoration of its natural spawning and rearing wetlands habitat for these fish, and the reintroduction of these fish back into their natural habitat.

C. Upper Klamath Lake Wetlands

Actions

1) Additional drained lake bed lands around Upper Klamath Lake should be restored to wetlands, following in the path of similar efforts in the past. Expanding refuge wetlands will restore fish and wildlife habitat, improve water quality, and increase natural water storage.

2) The Bureau of Reclamation's acquisition of the 7,000 acre Agency Lake Ranch provides an important opportunity to restore wetlands habitat and improve water quality. However, the Bureau should refrain from operating this property or other similar

restoration projects merely for deep-water storage for the Project. If managed appropriately, the land can provide natural water storage, wildlife habitat, and multiple water quality benefits.

3) Lake levels in Upper Klamath Lake should be maintained at sufficient levels to keep water in the Upper Klamath Lake National Wildlife Refuge and provide fish spawning and rearing access to the lake's surrounding marshlands.

Background and Rationale

Historically the 133-square mile Upper Klamath Lake was fringed with more than 80,000 acres of wetlands. However, diking and draining of these marshes to promote cattle grazing and farming has eliminated more than three-fourths of these wetlands. The loss of wetlands and runoff of cattle waste, fertilizers and other chemicals contributes to the severely degraded water quality in Upper Klamath Lake.

The majority of wetlands that still remain around Upper Klamath Lake are within the 14,400 acre Upper Klamath National Wildlife Refuge. Efforts by federal agencies, conservation organizations, and private landowners have shown that drained wetlands in this area can be restored.

Partial or complete dewatering of the Upper Klamath National Wildlife Refuge has occurred during most of the recent years, vastly limiting its value for fish and wildlife and cutting off access by the endangered qapdo (shortnose sucker) to what was once some of its most important spawning and rearing habitat, greatly contributing to its decline.

D. Riparian Restoration

Actions

1) Steamside riparian areas in the Williamson, Sprague, and Wood Rivers north of Upper Klamath Lake, and in the Shasta, Scott and Trinity River sub-basins, and in other high priority areas throughout the basin, need to be protected and restored through willing seller land and water rights purchases, conservation easements, replanting of riparian vegetation, cattle fencing, and other means.

2) Many common land uses near lakes and rivers need to be re-evaluated and their impact on riparian areas reduced and mitigated. Inflow of agricultural chemicals and other sources of water pollution need to be identified, controlled and mitigated.

3) Unscreened water diversions which suck fish into irrigation or hydropower systems need to be identified and properly screened.

4) Numerous fish passage barriers exist within the basin, and all should be evaluated and if possible removed to allow maximum access of native fish to their historic spawning

and rearing habitat. If necessary to provide suitable fish passage and restore ecological functions, diversions and dams should be modified or removed.

5) Additional riparian restoration projects will improve fish and wildlife habitat and water quality, and increase the natural water storage capacity of riparian areas.

Background and Rationale

Decades of destruction of riparian areas throughout the Klamath Basin has damaged streams and wildlife habitat, degraded water quality and greatly reduced natural water storage. Throughout the basin, loss of protective riparian vegetation has led to elevated water temperatures beyond the preferred temperature ranges of salmonids and other native fishes, and to high sediment loads. Many of these impacts can be cost effectively controlled or eliminated using best management practices requiring minimal change in land uses.

Although the infamous A-canal has recently been screened, the Bureau of Reclamation estimates that there are still 220 unscreened water diversions within the Upper Klamath Basin that potentially entrain endangered suckers, not even including those within the Sprague or Wood Rivers.[1] Installing screens at unscreened water diversions in order of priority of impact will go a long way toward reducing fish mortality in the Upper Basin.

There are several dams within the basin that are fish passage barriers and which provide little or no offsetting benefits, or for which their benefits (such as irrigation water) can be cost-effectively supplied by other nondestructive means. The National Research Council's Klamath Committee's Final Report specifically recommends removal of Chiloquin Dam, plus serious consideration of Iron Gate Dam and Dwinnell Dam (on the Shasta River, the Klamath's major tributary) as candidates for removal, and urges the "removal or provision for effective passage at all small dams and diversions through the distribution of coho salmon, to be completed within 3 years."

E. Forest and Uplands Management

Actions

1) Largely forested upland areas should be managed to restore normative hydrological functions, and reduce excessive sediment loading of streams. Managers should work to reduce run-off, decrease erosion, increase natural water infiltration, and increase water storage capacity of upland soils.

2) Additional funding should be provided for road decommissioning in priority watersheds within the basin.

3) Restoration forestry, focused on areas in which past management has harmed ecosystem health, should be used as an important tool for restoring normative ecological

processes in the Klamath Basin. Riparian areas in particular should receive additional protections on both public and private lands.

4) All remaining roadless areas within the basin on federal public lands of 1,000 acres or more should be protected from road building, logging, or other types of development that could harm their ecological health, alter hydrology, or further impair water quality.

5) Logging practices, particularly on private lands, should be subject to the federal Clean Water Act and similar state water protection laws to control their impacts on stream water quality.

Background and Rationale

Management of national forest lands as well as industrial timberlands has a direct impact on the hydrology, water quality, and fish and wildlife habitats of the Klamath Basin. Past logging and road building activities have reduced the forest's natural water storage function, increased run-off, and led to increased sediment loading and degradation of streams. In many forested areas, the density of unpaved logging roads is very high, contributing to serve erosion and sediment loading of streams. Independent scientific panels studying the effectiveness of logging rules for private timberlands in both Oregon and California have concluded that current rules are insufficient to prevent extinctions. Increasingly, both federal timber sales as well as private land industrial logging operations need to be scrutinized to make sure their impact on riparian areas is minimized or eliminated, and logging practices improved.

The National Research Council's Klamath Committee's Final Report also recommends "prescription of land-use practices for timber management, road construction, and grazing that are sufficiently stringent to prevent physical degradation of tributary habitat for coho, especially in the Scott, Salmon, and Trinity River basins as well as small tributaries affected by erosion."

II. RESTORING A NORMATIVE HYDROLOGY AND FLOWS Damming and diversion of rivers, and draining of wetlands, has dramatically altered the natural hydrology of the Klamath Basin. Excessive or poorly planned logging, grazing, road construction, and other land uses have contributed to the problem. Demand for water, particularly for irrigation, now far exceeds the basin's available water supply, yet additional water permits are still being issued in ways that sacrifice fish and wildlife and Tribal Trust water obligations. Poor water flows released from irrigation use into the lower river have triggered massive fish kills and devastated lower river and coastal fishing-dependent economies. Water usage is rarely measured or monitored, and illegal use is common. The following actions should be taken to restore the normative hydrology and flows in the Klamath Basin:

Actions

1) Restorative flows must be provided in the Klamath River and its tributaries, particularly in the Scott, Shasta and Trinity River sub-basins, to meet instream flow needs for fish and wildlife while providing for adequate lake levels in Upper Klamath Lake and sufficient water for Klamath Basin national wildlife refuges. Klamath Project agricultural water deliveries as well as agricultural water deliveries from the Scott, Shasta and Trinity sub-basins should be adjusted as necessary to help achieve this goal.

2) The Trinity River Mainstem Fishery Restoration Record of Decision signed December 2000 should be fully implemented to restore roughly half of its natural flows back to the Trinity River, the Klamath River's largest tributary. Other out-of-basin water transfers should be phased out and the water originating in the Klamath Basin restored back to the Klamath Basin.

3) Natural water storage capacity of Upper Klamath Lake, Lower Klamath Lake, and Tule Lake should be increased through restoration of normative wetland/lake systems in these areas. Other options for off-stream water storage should be studied, and implemented if environmentally sound.

4) Water conservation measures should be aggressively pursued so that water conflicts can be reduced. A basin-wide water conservation plan, with accompanying water use efficiency standards, should be developed and implemented. The Reclamation Reform Act of 1982's requirement that Project users develop and implement water conservation plans should be enforced. However, water saved through conservation should not be appropriated for new uses, but should be used first to satisfy unmet instream and refuge needs and to reduce existing water conflicts.

5) No new surface water withdrawal permits should be issued in the basin until the sustainable level of water availability has been ascertained, and adequate provision has first been made for instream flows for fish and wildlife as well as Tribal Trust obligations in all water-year types. No new permanent groundwater pumping permits should be issued until the completion of studies of groundwater availability have determined what the sustainable level of draw on groundwater is without depleting aquifers.

6) All ground and surface water users in the Klamath Basin should be required to install and maintain measurement devices, which allow for the determination of actual water use. All water users should also be required to report their water use on an established schedule. A water right enforcement strategy that effectively detects and penalizes violators, and encourages compliance, should be implemented throughout the basin. These actions can reduce illegal and wasteful water uses and measure progress in meeting instream flow needs.

7) Dry year fallowing, retirement of water uses, and acquisition and transfer of water rights from willing sellers for conservation purposes are all necessary tools that should be funded, promoted, and utilized throughout the basin in order to meet instream, lake level and refuge needs. Institutional barriers that prevent water transfers and water banking for conservation purposes should be removed.

8) The potential for conjunctive use of groundwater injection for water storage purposes should be investigated.

9) Authorization and funding should be provided for the timely completion of a comprehensive flow study in the Klamath Basin and all sub-basins. Priorities should include the Klamath mainstem, Shasta and Scott Rivers.

10) Water needs for the basin should be analyzed, planned and addressed as a whole, regardless of state and local jurisdictional divisions. Fragmentation of basin planning across artificial boundaries and among innumerable agencies merely generates political turf-wars, gridlock and waste. Existing institutions for basin-wide planning and coordinated restoration efforts should be organized, supported and strengthened.

Background and Rationale

Water is a precious and limited commodity in the Klamath Basin. While water is vital to maintaining the ecological integrity of the Klamath Basin and in supporting Native American Tribal Trust resources and economically valuable commercial and sport fisheries, the dominant use of water in the Klamath Basin remains irrigated agriculture. In many cases, however, irrigation use is inefficient and wasteful, heavily subsidized at taxpayer expenses (thus eliminating economic incentives to conserve) and exceeds what can sustainably be used without sacrificing fish and wildlife or ignoring Tribal Trust water obligations to Native Americans.

Historically, the flow regime in the Klamath River was somewhat unique in that the difference between peak flows in winter and low flows in the fall was proportionately less than for most western rivers. This was a result of the large natural wetlands storage capacity of Upper Klamath Lake and Lower Klamath Lake. Damming and diversion of rivers, draining of wetlands, and over-expansion of irrigated agriculture in the Upper Klamath Basin has had a pronounced effect on the hydrology of the whole Klamath Basin. Excessive or poorly planned logging, grazing, road construction, and other often unnecessary land uses on surrounding uplands have all too often contributed to the problem. Peak flows in the winter and spring months are now greater than historically occurred, and low flows in the summer and fall months are now greatly diminished. (Figure 5).

Seasonal shortages of water result in the failure to meet the full array of water needs. Excessive and often wasteful water withdrawals have contributed to the decline and listing under the Endangered Species Act of resident and anadromous fish, to the failure of streams and lakes to meet water quality and temperature standards, and to the non-fulfillment of Native American senior reserved water rights. The wildlife refuges rank last in the basin's fiercely contested water allocation scheme and are in need of a secure source of water.

Significant out-of-basin water transfers still occur, even while the Klamath Basin itself is starved for water. Historically as much as 90 percent of the Trinity River's flow into the Lower Klamath was once diverted to feed inefficient and federally subsidized corporate farms served by the California Central Valley Irrigation Project. Since the signing of the "Trinity River Mainstem Fishery Restoration Record of Decision" in December 2000, however, Trinity River flows should have been restored to at least 48 percent of their natural flows, but this decision is bogged down in court by challenges from Central Valley irrigators and cannot yet be fully implemented. An additional 30,000 acre-feet of water is also removed at the top of the basin and piped to the Rogue River Basin long before it even gets to Upper Klamath Lake, further exacerbating water conflicts within the Upper Basin.

Throughout the basin, metering of water use and tracking of flows is often inadequate to nonexistent. Illegal water uses are common but cannot be tracked or curtailed by state authorities. Water usage within the basin should be metered and Watermaster services should be available in all significant agricultural use areas. Inriver flow gauges should be installed and reliably funded in many more locations, with that gauge data readily available to the public.

It is widely acknowledged that limited water resources in large parts of the Klamath Basin are now over-appropriated, yet both Oregon and California continue to issue new surface water diversion and groundwater pumping permits. At a minimum, there should be a moratorium on issuance of such permits until the extent of over-appropriation, the sustainable levels of aquifer groundwater pumping and the connections between groundwater and surface water have been fully ascertained. Many of those studies are underway, but have not been completed. Without that most basic information on what the sustainable levels of water withdrawals actually are, and the impacts of more withdrawals on neighbor's aquifers and wells or on surrounding stream flows, to continue to allow new water withdrawal permits simply creates more water conflicts.

There should also be a moratorium on issuing new surface water rights in the Upper Klamath Basin until the Oregon Klamath Basin water adjudication process is completed. Until the extent of current legal surface water usage has been determined, the State of Oregon risks making an already bad situation worse by continuing to issue water permits in an obviously over-appropriated basin.

III. REFORMING THE KLAMATH IRRIGATION PROJECT The U. S. Bureau of Reclamation's massive Klamath Irrigation Project is the single largest water user in the basin, and is responsible for much of the damage to the Upper Klamath Basin's ecology. Because the Project bears such a large share of responsibility for water problems in the basin, the Project needs to be required to contribute a large share to the effort to find and implement sustainable solutions.

Actions

1) Fish, wildlife, and ecosystem conservation and restoration should be made an explicit purpose of the Klamath Project. Project purposes should be amended accordingly in any legislation concerning the Klamath Basin.

2) Restorative flows should be provided in the Klamath River and its tributaries to meet instream flow recovery-level needs for fish and wildlife, while providing for adequate lake levels in Upper Klamath Lake and sufficient water for the Klamath Basin National Wildlife Refuges. Klamath Project and tributary agricultural water deliveries should be adjusted as necessary to help achieve these goals.

3) Water conservation should also be a higher Project priority. Inefficient and wasteful irrigation practices, now common, should be curtailed or eliminated. Water use should be far more carefully metered and tracked as it flows through the Project, and illegal uses eliminated. Economic incentives should encourage water conservation, not waste.

4) Water uses that are non-agricultural and of minimal economic or ecological value should be retired. Willing seller purchases of water rights and water right retirements, or alternatively the re-dedication of water rights to instream fish and wildlife needs, should be used where necessary to balance water demand with supply as well as to fairly compensate landowners willing to help conserve water. Willing seller water purchases should include landowners above the Project who now take increasing volumes of inflow water before it even gets to Upper Klamath Lake.

5) Federal funds for cost-effective water conservation and wetlands restoration programs and, if necessary, drought disaster assistance, should be a high priority and supported by everyone in the basin. Other commonly used economic mechanisms to fairly compensate economic losses to landowners who must forego water during droughts or because of fish and wildlife needs, such as crop insurance programs and drought insurance, should also be made more broadly available or become mandatory within the Project.

6) To the extent possible, individual Project-dependent farmers and their families must be helped through the necessary economic transitions so that they can move toward a viable and productive as well as sustainable farm economy. The burden of change should be borne by the state and federal agencies who caused the problem, not by its victims.

Background and Rationale

Authorized in 1905, the Klamath Irrigation Project controls the flow of water in the upper basin and headwaters through an elaborate network of seven dams, 45 pumping plants, 185 miles of canals and 516 miles of lateral ditches. Under current Bureau of Reclamation policies, flows released to the lower river and to the national wildlife refuges are generally only whatever water is left over after fully meeting Project-user irrigation demands, even in drought years. Yet these irrigation demands are often excessive in a basin where rainfall is so limited and droughts are becoming more frequent. During the driest summer and fall months, for instance, when increased flows are most needed in the lower river to protect fish, the Project often diverts more than half

of all the flows from the headwaters, leaving the fish in the lower Klamath River little more than a warm trickle. Lack of flows in the lower river caused by Project operations was identified by both the State of California Department of Fish and Game and the U.S. Fish and Wildlife Service, in separate reports, as the driving factor in the devastating September 2002 lower river fish kill.

Furthermore, the drier the water year, the larger a proportion of all the remaining water from the headwaters the Project now takes in. In other words, instead of sharing the pain of drought, the Project exacerbates conflicts by shifting the burden of drought disproportionately to lower river water users, fish and wildlife. Even so, the Bureau's own models indicate that the Project will have insufficient water to meet its irrigation water commitments in 7 out of 10 future years.

Over-development and over-commitment of increasingly limited water supplies has led to massive Project water instability, which in turn makes it difficult for Project-dependent farmers to finance their operations or retain their markets. Poor water monitoring also makes it difficult to impossible for Project managers to either ascertain or control the flow of water within the Project, or to conserve water in dry years.

Project-dependent farmers also typically do not subscribe to well-established economic and drought risk-spreading mechanisms, such as drought or crop insurance. The Klamath Project has among the lowest enrollments in such programs in the United States. Drought-stricken farmers should not be left without automatic economic relief even when there is no water available after meeting fish, wildlife and Tribal water obligations. Yet droughts are becoming increasingly common in the already arid Upper Klamath Basin, and can have devastating consequences. Such droughts should be planned for, not left to fate.

IV. RESTORING WATER QUALITY The Klamath River and several of its tributaries have been listed by the federal Environmental Protection Agency (EPA) as "water quality impaired" under the federal Clean Water Act. Poor water quality is a major limiting factor for all fish in the basin. The following actions should be taken to improve water quality in the Klamath Basin:

Actions

1) Interstate TMDLs ("total maximum daily loads") should be established and implemented for the Lost and Klamath Rivers. This should be the highest water quality priority of the EPA, Oregon Department of Environmental Quality and California Northcoast Regional Water Quality Control Board.

2) Log storage in the Klamath River and Upper Basin lakes should be terminated and many other activities that negatively impact water quality should be altered or mitigated. The feasibility of and benefits to water quality from removing accumulated bark from the river and lake bottom in areas where logs have long been stored should be investigated.

3) Land management modifications, willing seller land and water rights acquisitions, and conservation easements envisioned in various sections of this document as measures to restore fish and wildlife habitats and emulate natural hydrology should also be implemented because they will result in substantial improvements to water quality.

4) Wetlands restoration is also a water quality improvement measure. Natural wetlands recapture, filter out and biodegrade many environmental pollutants, and should be restored to full ecological functions to provide this benefit as well as many others.

5) The Clean Water Act's prohibitions on new discharges, for example new sewer hook-ups and industrial discharge permits, into already impaired waterways should be enforced.

6) Widespread use of pesticides on commercial row crops grown on public lands leased by farmers within the national wildlife refuges should be substantially curtailed and eventually phased out as the leaseland commercial farming program itself is phased out.

Background and Rationale

Because it emanates from an old and therefore nutrient rich lake system, the Klamath River is naturally nutrient rich as compared to most other northwest salmon rivers. This may have been partially responsible for the traditionally high salmonid production of the river system, which historically ranked behind only the Columbia and Sacramento-San Joaquin systems in productivity. However, a combination of factors, including wholesale conversion of wetlands for agriculture, reduction in flows due to water diversion, agricultural drainage and point source chemical pollution, have all resulted in super-nutrification of Klamath Lake and the Klamath River. Nutrient loads emanating from the upper Klamath Basin are intensified when the Shasta and Scott tributaries join the Klamath River in California. These sub-basins also have extensive agricultural drainage systems high in nitrate fertilizers and animal wastes.

Natural wetlands serve a variety of ecological functions, among them the ability to recapture, filter out and biodegrade a wide variety of water pollutants. However, with the loss of more than 75 percent of the historic Upper Basin wetlands, this has meant the loss of 75 percent of this natural water purification mechanism. Restoration of wetlands also serves to improve water quality as well as provide more natural water storage, habitat and food for waterfowl as well as many other species.

The Klamath River is listed by the federal Environmental Protection Agency under the Clean Water Act as "water quality impaired" because of low dissolved oxygen, excessive nutrients causing algae blooms, and high water temperatures. Agricultural pesticide contamination may also be a growing problem. Multiple-fish kills, including kills of endangered qapdo and c'wam (i.e. shortnose suckers and Lost River suckers) in the Upper Basin, are an annual event and the widespread killing has spread to the Lower

Basin, affecting commercially valuable salmon, steelhead and other fish species. The Lost River and Shasta River areas also are listed as water quality impaired.

The State of Oregon is obligated under a 1986 federal consent decree to develop a plan for reducing nutrients in the Klamath River. This was supposed to be completed by 1996. However, the first plan, called a Total Maximum Daily Load (TMDL) in the parlance of the Clean Water Act, was rejected by the federal Environmental Protection Agency as insufficient. An Oregon TMDL for phosphates in Upper Klamath Basin waters is now in place, but a plan to reduce other types of nutrient pollution in the Upper Klamath Basin is still urgently needed. A similar court-ordered consent decree requires the State of California to adopt TMDLs for much of the lower basin, but this program is far from completion, poorly funded and been unable to meet its own deadlines. It also makes sense to do these TMDLs in tandem under the interstate TMDL provisions of the Clean Water Act.

Finally, the use of public lands national wildlife refuges to grow heavily sprayed and chemically fertilized commercial row crops is a national scandal. Nowhere else in the nation is private commercial farming on a national wildlife refuge allowed, if at all, to such an extent as in the Upper Klamath Basin. Particularly appalling is the heavy use of pesticides on the national wildlife refuges in areas where such chemicals can readily poison waterfowl and contaminate nearby water bodies. Spraying of pesticides toxic to fish and wildlife is, we believe, incompatible with the fundamental purposes of the national wildlife refuges and should be phased out, just as the commercial farming leaselands program itself should be phased out, and these public lands returned to the public purpose – a national wildlife refuge – for which they were originally intended.

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[1] See *Final Biological Assessment on the Effects of Proposed Actions Related to Klamath Project Operations (April 1, 2002-March31, 2012) on Federally-Listed Threatened and Endangered Species,* (February 25, 2002), Table 4.4 on pg. 27.