Chapter 4

4. Determine the dollar value of non-federally-funded Restoration Program effort. Determine, to the extent possible, the amount of restoration funding leveraged by Task Force expenditures.

The task directs the evaluation team to survey the Klamath basin restoration community and collect information concerning the projects that each community entity has carried out, and the nature and amount of the funding that has become available to each such project. From the information assembled, the team was to determine the "total value of non-federal effort" made on behalf of the Program's objectives as a result of Program expenditures.

The team updated the list of 78 contact persons representing 50 Program cooperators by phoning each agency or individual for a correct contact name, address and phone number. Using that updated list we mailed out survey packets to each contact person in late 1997.. The packets contained individualized requests for information on any matching funds, in-kind contributions and leveraged funds, relating to each of the 217 Task Force-funded projects from 1989 - 1997.

Responses trickled in. Phone call follow-ups were made through the remainder of 1997. In the end, the team obtained reports from 15 cooperators representing 27% of all cooperators. They reported a total of $2,786,285 in in-kind, matching and leveraged contributions.

The reports received represent 59 of the 211 total Task Force funded projects for 1989-1997, or 28% of projects. Included also were reports on projects not funded by the Task Force, making a grand total of 68 projects.

The reports represent $1,546,334 in Task Force funding, or 17% of total.

The Data

	Fed Contributions	Non-Federal Contribs	Totals
Task Force-funded projects	788,026	1,241,843	2,029,869
Projects funded by other sources	318,400	438,016	756,416
Totals	1,106,426	1,679,859	2,786,285

Of the total $2,786,285 in outside contributions (which includes cash and in-kind), $1,106,426 came from federal sources, and $1,679,859 came from non-federal sources.

Of that same total, $2,029,869 was received for projects funded by the Task Force and $756,416 was received for restoration projects funded by other sources.

Non-federal contributions to Task Force-funded projects totaled $1,241,843. With Task Force funding on those projects totaling $1,546,334, the reports show an 80.3% non-federal "match."

Interpretations

Because we received responses from a fairly representative variety of cooperators – non-profits, contractors, agencies and individuals – it seems quite likely that this 80% match can be extrapolated to most, if not all, of the cooperators who did not report.

The percentage is probably actually substantially higher because:

a) Most cooperators who did report stated that they were unable, due to lack of time and record-keeping, to supply information on many of the sources and amounts of outside contributions they had received, especially in unofficial ways.

b) Other entities such as private, for-profit firms which are contributing in various ways, were reluctant to report, probably out of a fear of being held to the "rough estimates" at some future time.

c) There appears to be a large base of local support for restoration projects, which is almost impossible to track and quantify. For example, the help rendered by participating landowners is only barely touched on in these reports, likewise that from school children and staff.

Recommendations

These "match" reports were not easy nor quick for most of the reporting cooperators to generate. All of the cooperators who have received multiple grants from the Task Force and who are non-governmental made the statement that this constituted a substantial unexpected increase in their administrative costs, for which there was no funding and no time.

1- The grant agreements should *require* the grantees to include in their project completion reports any cash contributions to the project-in-question the grantees were successful in securing and should *encourage*, as well, the grantees to report any "soft" match - volunteer labor, supplies, etc. they were successful in securing for the project-in-question - or for their any of their Klamath Basin restoration efforts.

2- The KRFWO should give some serious thought to how they would like grantees to report their cash and non-cash project contributions, based on the use to which such information will be put and how, therefore, it should be formatted for maintenance in a database. [We recommend elsewhere the KRFWO retain a data manager.]

Figure 4-1. Resources Leveraged by Direct Task Force Investment, by Type of Contribution

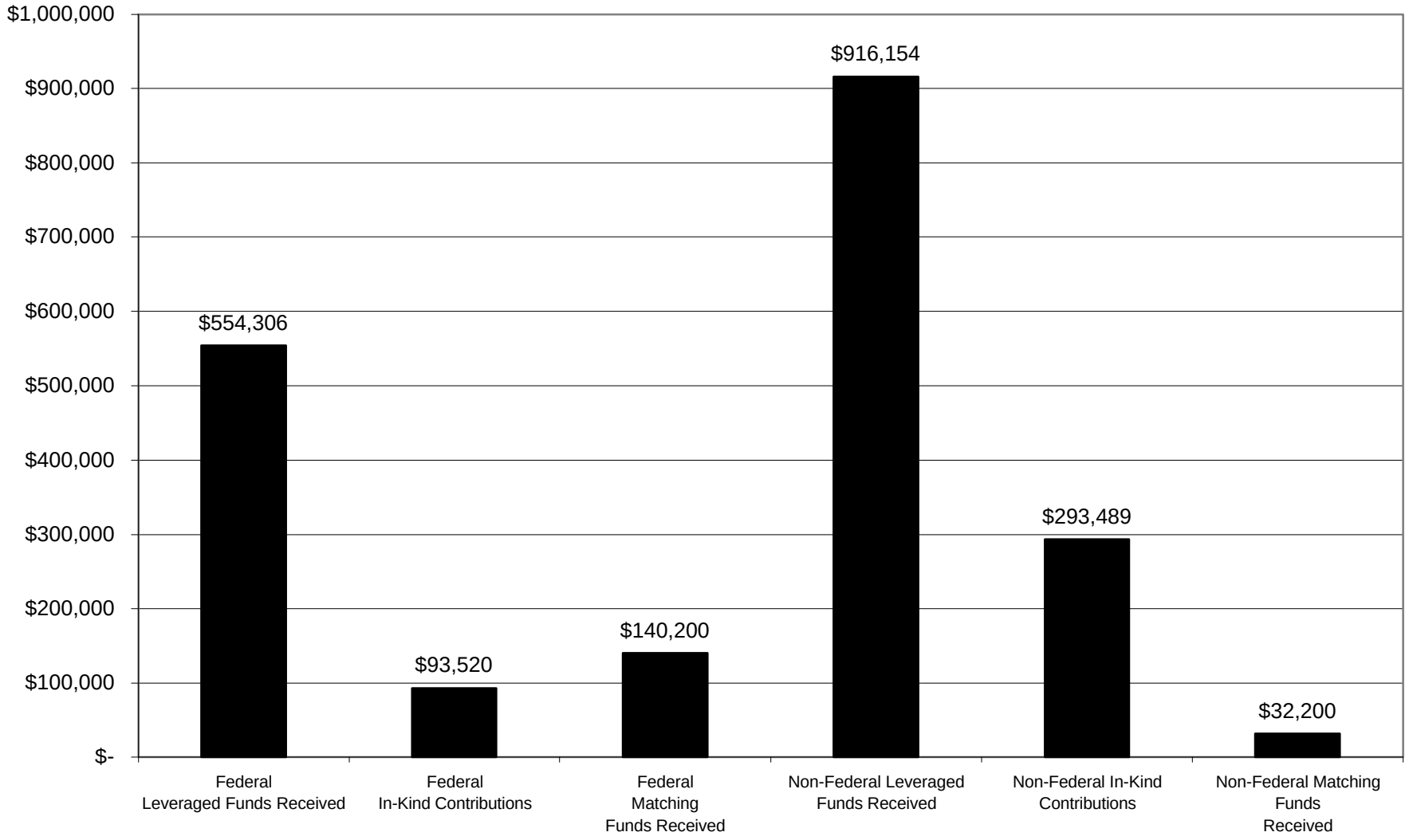
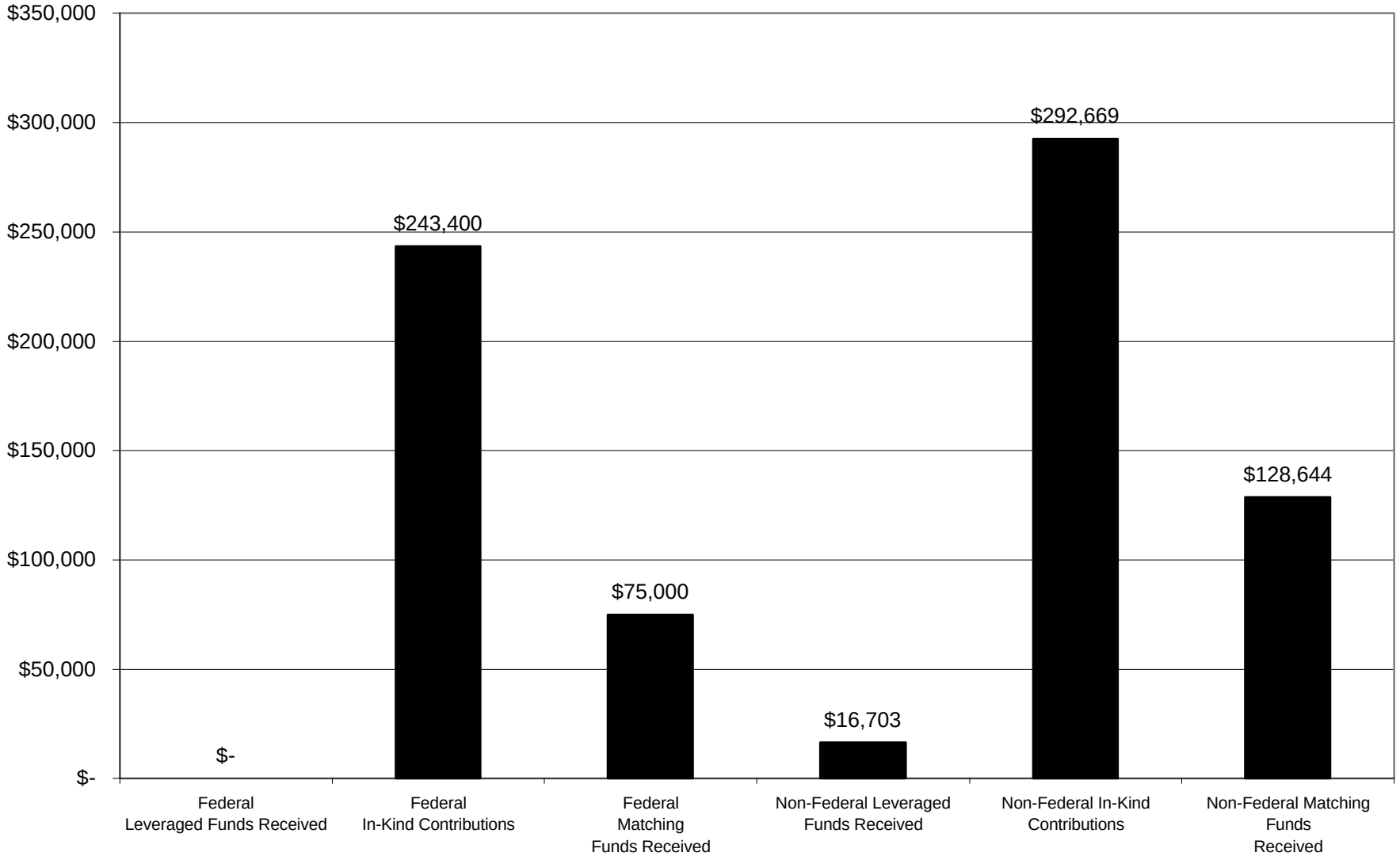


Figure 4-2. Resources Leveraged Indirectly by Task Force Investment, by Type of Contribution



Chapter 5

5. Assess anadromous fish habitat changes that have occurred since the Restoration Program was implemented. Qualitatively and (where possible) quantitatively assess anadromous fish habitat changes through Task Force and other agency on-the-ground projects. Qualitatively and (where possible) quantitatively assess anadromous fish habitat changes due to natural processes and land use. Evaluate the success of the Program's habitat restoration projects.

Substantial habitat change in various Klamath River sub-basins has occurred since the beginning of the Restoration Program in 1987. The discussion that follows will focus on the factors that limit fish production in the basin and the degree to which they have improved or worsened since 1987, particularly changes in stream channels and water quality. Improvements are attributed, in part, to in-stream habitat structures, bank stabilization and riparian habitat restoration. Elsewhere, serious degradation of aquatic habitat has occurred, some of it man-caused and some of it due to natural forces. Major fires, a prolonged drought, and damaging storm events have all occurred since the inception of the Restoration Program. These natural events often make it difficult to determine which negative impacts on fish habitat are natural and which are human-caused. The full benefit of restoration projects already implemented may take some time to be realized. In some sub-basins, restoration is hampered by poor watershed health. The findings are summarized below by basin region. Full documentation of the team's findings, including references and illustrations, are found at Appendix 5.

Lower Klamath Region

Channels of most Lower Klamath tributaries have continued to fill in as sediment yield in the watersheds remains high. Timber harvest in all Lower Klamath watersheds exceeds cumulative effect thresholds and all streams (except upper Blue Creek) have been severely damaged during the evaluation period. Clear-cut timber harvest in riparian zones on the mainstem of lower Blue Creek and the mainstem Klamath River occurred in 1998 in inner gorge locations. Aggradation in salmon spawning reaches can be expected to persist for decades. Fourteen of the seventeen major tributaries in this region go underground in late summer (Voight and Gale, 1998). An exception is upper Blue Creek, which is a U.S. Forest Service Northwest Forest Plan Key Watershed. Blue Creek has maintained its habitat quality and should provide gene resources for Salmonid recovery over the long term in the Lower Klamath Basin so long as this watershed remains protected.

The Yurok Tribe is working cooperatively with the Simpson Timber Company on the abatement of problems related to roads in McGarvey Creek. Similar Task Force-funded effort on Pine Creek in the Lower Klamath region did not succeed because sediment contributions from other areas within the watershed remained high (Hoopa Fisheries

Department, 1997). Timber harvest and road building continued on both Tribal and private lands in the Pine Creek watershed.

The Klamath River Estuary remains in good health (Wallace, 1998). Substantial benefits could be realized if the wetland areas adjacent to the estuary and along Hunter Creek could be restored. Agricultural impacts on lower Hunter Creek and Salt Creek have severely degraded wetlands and stream conditions. The stream channel of Salt Creek is so altered by eutrophication in reaches used for pasture that the channel fills in and blocks fish access to High Prairie Creek, where salmon spawning habitat is recovering.

Hopelain (in press) found that Hunter Creek has one of the lowest scores for habitat restoration success in northern California. High watershed disturbance is confounding habitat restoration efforts in the entire Lower Klamath Basin. The Yurok small-scale fish rearing program did not succeed in rebuilding salmon numbers because the stream habitat was too poor to support natural spawning.

Middle Klamath Region

While Key Watersheds on Six Rivers National Forest have shown improvement since 1987 many streams on the Klamath National Forest (KNF) deteriorated as a result of damage from the January 1997 storm. The storm caused $27 million in damage to roads on the Forest (De La Fuente, 1998). Roads, recent clear-cuts and areas burned in the 1987 fires had the greatest number of landslides. De La Fuente found that a rain-on-snow event triggered many natural landslides but that road failures and landslides in clear-cut areas added to sediment yield substantially in some watersheds. Not all watersheds that experienced wildfires had high storm-related stream damage. While Clear Creek and Dillon Creek were both partially burned, they have maintained high fish habitat and water quality values.

Many watersheds in the Middle Klamath region are over their cumulative effects thresholds because of extensive timber harvest and high road densities. This combination of factors appears to have led to increased peak flows and sediment transport in some watersheds, which caused a substantial setback for instream restoration projects. The structures in Elk Creek had extremely high failure rates. Other sub-basins such as Indian Creek and Beaver Creek showed a high degree of variability with regard to instream structure damage with some reaches seriously impacted and others surviving well. The TF-funded fish screen and fish passage project on lower Horse Creek was completed just before the January 1997 storm and was almost completely destroyed by high flows following the storm. The storm, which had a recurrence interval of less than 10 to 35 years, caused a high degree of damage to Middle Klamath region streams generally. Some of the damaged streams had been providing critically-important cold water refugia at their mouths and in lower reaches (Belchik, 1997). De La Fuente noted that water temperatures in Elk Creek, a Key Watershed, had risen substantially as a result of the flood impacts.

Olson (1997) demonstrated that instream structures in Indian Creek and Elk Creek were having the desired effect of diversifying habitat. The structures in these streams were attracting several age classes of steelhead, coho juveniles and chinook, whereas the unaltered reaches had primarily steelhead young of the year. The January 1997 storm caused the scouring of 446 miles of stream channels on the Klamath National Forest, much of it in the Middle Klamath region. The benefit of instream investments since 1987 in Middle Klamath Basin tributaries was substantially lost to the storm because of poor watershed health. Camp, Bluff and Red Cap Creeks largely avoided flood damage because of improving watershed conditions.

Salmon River

Although the Salmon River was extensively burned in 1987, it has maintained its high habitat quality. Some increase in fine sedimentation resulted from the fire disturbance but several years of drought (1987-1992) allowed the watershed to stabilize. The 1997 storm caused some damage in the upper South Fork, but overall damage was light. Some riparian projects and slide stabilization efforts in the South Fork Salmon River were lost to flood damage. Cooperative efforts by local residents, organized by the Salmon River Restoration Council, likely limited flood damage to roads (Peter Brucker, personal communication). Watershed residents patrol the sub-basin's road system during major storms to clear culverts of debris, to prevent stream damage.

De La Fuente and Haessig (1994) found that the amount of roads in the Salmon River watershed as of 1989 could be expected to trigger twice the amount of sediment than would be expected under pre-disturbance conditions in the event of a 100-year interval storm. Major investments in road-related erosion control are urgently needed in the Salmon River Basin.

Scott **River**

Riparian conditions on private lands in the lower Scott Valley have improved as a result of restoration efforts. Cattle are excluded from over 13 miles of private-land streams in one contiguous reach of the valley. Unfortunately, the 1997 storm and the following use of heavy equipment in stream channels caused widespread damage to riparian areas and the channel morphology in the East Fork Scott, Shackleford Creek, and Mill Creek. It is not possible to characterize the net change in riparian habitat from restoration versus these damaging factors at this time. One reason for that is that riparian planting projects have yet to mature. Bank stabilization projects using a combination of rip-rap and living materials withstood flood damage well and show promise for stabilizing banks and improving fish habitat.

The prolonged drought in the late 1980s and early 1990s decreased the available fish habitat in this sub-basin. Stock-water systems, alternatives to allowing livestock to enter the stream, have been installed on a number of ranches. These systems show potential for water conservation, but only fall flow issues for adult chinook salmon passage have been addressed by the Scott CRMP so far. Summer low flow conditions, caused in part by

agricultural diversions, continue to be severely limiting for juvenile salmonids in the sub-basin.

The French Creek watershed has been the focus of cooperative efforts by the local CRMP, private landowners and the County of Siskiyou. A decreasing trend in fine sediment in French Creek shows encouraging signs that erosion problems there are being abated. The January 1997 storm, however, caused major damage to lower Scott River tributaries on Klamath National Forest - Kelsey Creek, Middle Creek and Thomkins Gulch. The loss of cold water from these tributaries may impact Scott River salmon and steelhead populations since refugia at the mouths of these streams may be critical during summer low flow periods.

Shasta River

Riparian restoration on the Shasta River is more challenging than some of the other sub-basins because of poorly drained and/or alkaline soils in some reaches. Over a dozen landowners have participated in voluntary riparian restoration projects, and some, such as the Freeman Ranch project, have provided substantial benefits to fish habitat. Actions by two landowners, however, point up weaknesses in riparian zone protection under existing laws. The Shasta River at Highway 263 was channelized and rip-rapped with asphalt after the January 1997 storm. The riparian zone of the Shasta at its convergence with Big Springs Creek was bulldozed during the evaluation period.

The drought compounded water quality problems in this sub-basin. Tailwater recovery projects are showing significant promise for improving water quality, but wider issues of improving the efficiency of water use have yet to be addressed. Pulse flows have been used in recent years to decrease the impacts of summer water quality problems on salmon and steelhead. One diversion dam has been replaced by a pump on the Shasta River thereby facilitating fish passage and decreasing biological oxygen demand.

Restored riparian areas, cattle exclusion fencing, stock water access gates, and bank stabilization projects in the Shasta River Basin all survived the 1997 storm mostly intact.

Mainstem Klamath and its Estuary

The mainstem Klamath has shown a *substantial* decline in habitat quality since the inception of the Restoration Program. Problems related to temperature had been recognized previously, but critically low dissolved oxygen levels were discovered in the summer of 1997. The USFWS measured dissolved oxygen at 3.1 ppm at the Big Bar trap below Orleans. Such oxygen levels are lethal for salmonids. Belchik (1997) found that there were few viable cold water refugia for juvenile salmonids between Iron Gate Dam and Seiad Valley. Some of the streams that earlier provided critical refugia suffered substantial degradation from the January 1997 storm. The loss of cold water from these National Forest tributaries further exacerbates the high water temperature problems in the mainstem. Major influxes of sediment continue to pulse through the mainstem, restricting pool depths and temperature stratification. Precipitously declining adult summer

steelhead populations in all Klamath tributaries, and the loss of steelhead runs at Iron Gate Hatchery, indicate severe problems with ecosystem function on the mainstem Klamath River.

The Klamath estuary seems to have maintained its habitat quality and is not showing indications of poor water quality or substantial aggradation (Wallace, 1998).

Upper Klamath Region

While recent efforts have begun to restore wetlands, marshes and riparian areas in the Upper Klamath Basin, it is too soon to discern overall habitat trends in this sub-basin.