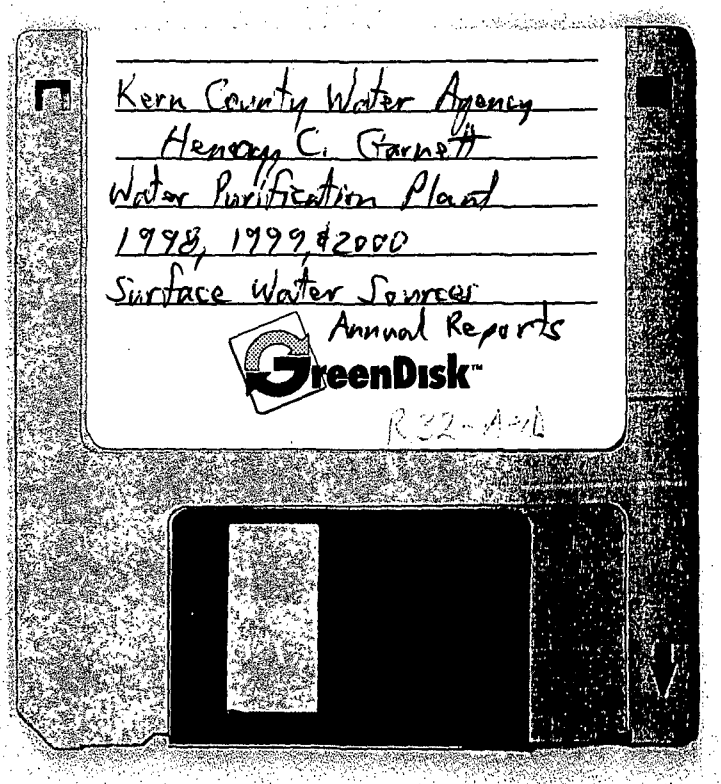
Kern County Water Agency
Henry C. Garnett
Water Purification Plant
1998, 1999 & 2000
Surface Water Sources
Annual Reports
GreenDisk™
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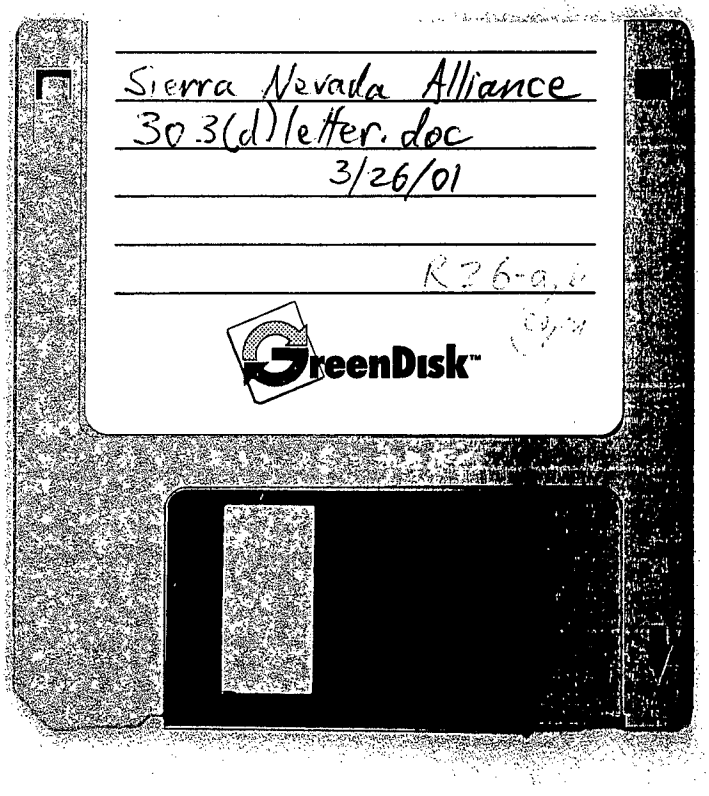
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March 26, 2001

To Whom It May Concern,

The Sierra Nevada Alliance is providing information to be used in the revision of California's Clean Water Act Section 303(d) list in response to your public solicitation. We have promoted watershed restoration in the Sierra Nevada for much of the past decade and understand the importance of the 303(d) list to mobilize people to take action and to provide funding to support that action. The following comments are meant to highlight threats and values in Sierra watersheds that may not have been clearly understood in 1997.

We encourage you to add the Middle Fork American River and the South Fork Feather River Watersheds to the Category 1 impaired watersheds list. Significant gold mining activity occurred in these two watersheds in the 19th and early 20th centuries, including some major placer and hard rock mining (see attached map from Long et al 1998). Experience in nearby watersheds indicates that such watersheds contain residual mercury and arsenic and are subject to significant acid mine drainage (USGS Mercury Mapping project at http://ca.water.usgs.gov/mercury/fs06100.html). The surrounding watersheds in the Feather, Yuba, Bear, and American River basins have been listed in part for these same concerns. Based on the natural resource values of these watersheds, including municipal drinking water supply and refuge for aquatic biodiversity, we encourage you to list these two watersheds as Priority Category I watersheds.

Several of the watersheds listed as Category I in 1997 support natural resource values that should make them Priority Category I watersheds in this next round of listing. Within the Sierra Nevada Ecosystem Project (1996) Peter Moyle recommended the creation of Aquatic Diversity Management Areas (ADMAs) in the Sierra to protect important populations of native fishes and amphibians and suggested 42 sub-watersheds that would be appropriate for these ADMAs. Based on this information we recommend that the Middle Fork Feather, Upper Kern, Upper Merced, Upper Kings, Upper Merced, Upper Tuolumne, Upper Stanislaus, and Upper Mokelumne watersheds be prioritized in the 303(d) list development in 2001. Lastly, based on their importance as municipal drinking water supply watersheds serving millions of people the upper Feather, American, Mokelumne, and Tuolumne watersheds should also be on the Priority Category I list.

If you would like to discuss this information further please do not hesitate to contact me at sierran3@sierra.net or (530) 542-4546.

Sincerely,

Phil Chang
Watershed Coordinator

References:

Long, K.R., DeYoung, J.H., and Ludington, S.D., 1998 Database of significant deposits of gold, silver, copper, leas and zinc in the United States: U.S. Geological Survey Open-File Report 980206A, 33p

USGS Mercury mapping project: http://ca.water.usgs.gov/mercury/fs06100.html

Moyle, P.B., and and R.M. Yoshiyama, 1996. Potential Aquatic Diversity Management Areas. In Sierra Nevada Ecosystem Project: Final Report to Congress, vol II. chap. 57. Davis: University of California, Centers for Water and Wildland Resources.

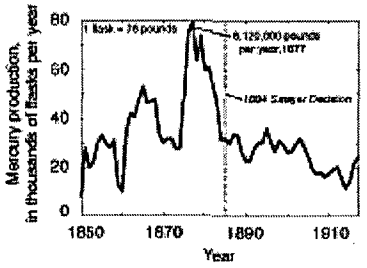

Figure 5. Mercury production from mines
in the Coast Ranges of California, 1850-1917 (Bradley, 1918).

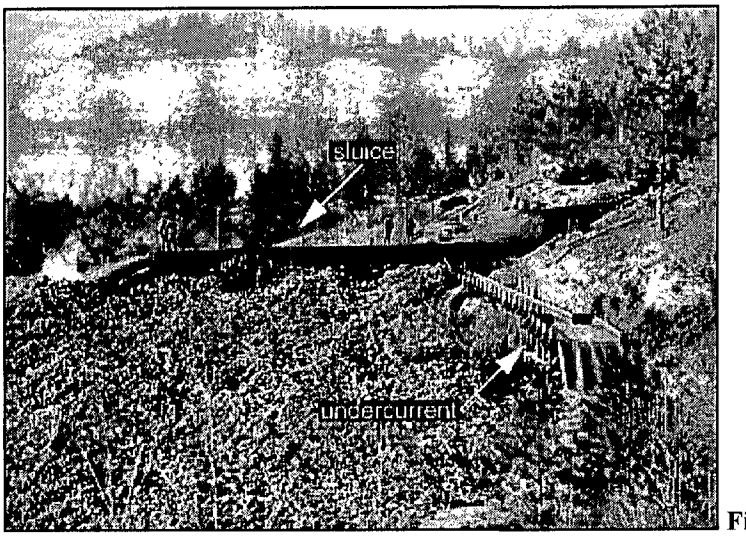

Figure 6. Undercurrent in use, circa 1860, Siskyou County, California.

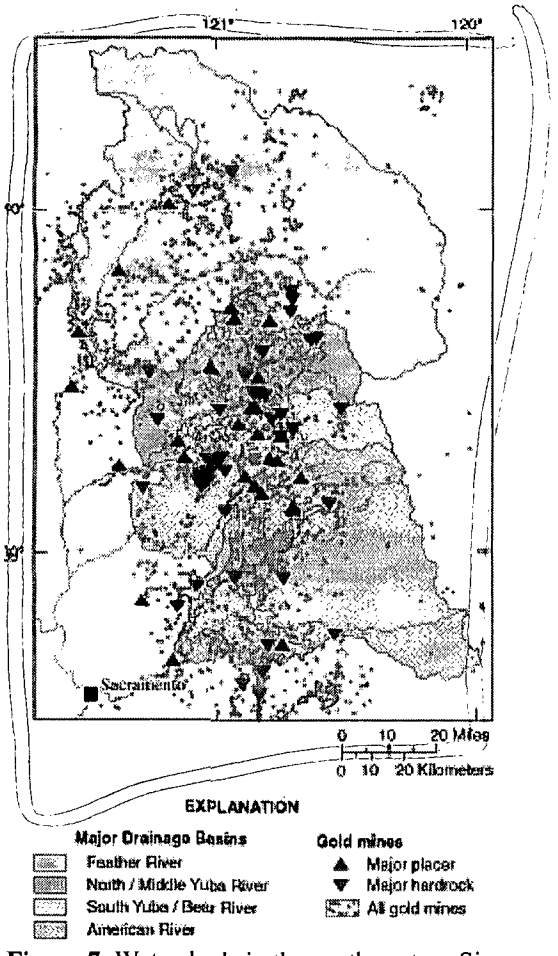

Figure 7. Watersheds in the northwestern Sierra Nevada of California showing past-producing gold mines (as in figure 4) and major placer and hardrock gold mines. Source: USGS KNOWNDEP database (Long and others, 1998).

Averill (1946) estimated that, under the best operating conditions, 10 percent of the mercury used was lost and, under average conditions, the annual loss of mercury was up to 30 percent. Mercury use varied from 0.1 to 0.36 pounds per square foot of sluice. We estimate that a typical sluice had an area of 2,400 square feet and used up to 800 lb of mercury during initial start-up, after which several additional 76-lb flasks were added weekly to monthly throughout its operating season (generally 6 to 8 months, depending on water availability). Assuming a 10-30 percent loss, the annual loss of mercury from a typical sluice was likely several hundred pounds during the operating season. From the 1860s through the early 1900s, hundreds of hydraulic placer-gold mines operated in the Sierra Nevada. The total amount of mercury lost to the environment from these operations may have been 3-8 million lb or more, from estimates by Churchill (1999) that about 26,000,000 lb of mercury were used in California. Historic records indicate that about 3 million lb of mercury were used at hardrock mines in stamp mills, where ores were crushed. Mercury was also used extensively at drift mines and in dredging operations. The present distribution and fate of the mercury used in historic gold mining operations remains largely unknown, and is the focus of ongoing studies.

TABLE 57.2

Potential ADMA watersheds of the Sierra Nevada region. A full description of each ADMA watershed is provided in Moyle et al. 1996.

West-Side Drainages
Sacramento River Tributaries
1. Antelope Creek
2. Dye Creek
3. Mill Creek
4. Pine Creek
5. Deer Creek
6. Big Chico Creek

Feather River Drainage
7. Yellow Creek
8. Middle Fork Feather River

Yuba River Drainage
9. Lavezolla Creek/Downey River

American River Drainage
10. North Fork American River
11. Rubicon River above Hell Hole Reservoir
12. Jones Fork of Silver Fork (above Union Valley Reservoir)
13. Rock Creek

Cosumnes River Drainage
14. Entire drainage

Mokelumne River Drainage
15. North Fork Mokelumne River

Stanislaus River Drainage
16. North Fork Stanislaus River
17. South Fork Stanislaus River above Pinecrest Reservoir
18. Rose Creek

Tuolumne River Drainage
19. Clavey River
20. South Fork Tuolumne River

Merced River Drainage
21. Entire drainage above McClure Reservoir

Upper San Joaquin Drainage
22. Mariposa Creek above Mariposa Reservoir
23. East Fork Chowchilla River
24. Finegold Creek

Kings River Drainage
25. Rancheria Creek
26. South and Middle Forks Kings River

Kaweah River Drainage
27. South Fork Kaweah River

Tule River Drainage
28. North and Middle Forks Tule River

Tulare Lake Foothill Drainages
29. Deer Creek

Kern River Drainage
30. Kern River above Isabella Reservoir
31. South Fork Kern River
32. North Fork Kern River

East-Side Drainages
Eagle Lake Drainage
33. Entire drainage, including Pine Creek

Susan River/Honey Lake Drainage
34. Willow Creek

Truckee River Drainage
35. Upper Little Truckee River
36. Sagehen Creek

Carson River Drainage
37. East Fork Carson River

Walker River Drainage
38. Buckeye Creek
39. West Walker River drainage

Mono Lake Basin
40. Mono Lake

TABLE 57.2 (continued)

Owens River Drainage
41. Owens River drainage above Crowley Reservoir
42. Convict Creek

Modoc Region[a]
Pit River Drainage
43. Mill Creek (South Fork Pit River)
44. Cedar Creek above Tule Reservoir
45. Ash Creek
46. Turner Creek

Goose Lake Drainage
47. Goose Lake

Cowhead Lake
48. Cowhead Slough

[a]Potential ADMA watersheds for the Modoc Region are included here for the sake of completeness, although they will not be discussed further in this chapter.

tem of protected aquatic SNAs would supplement a system of ADMA watersheds, helping to ensure that all native species and natural communities in the Sierra Nevada can persist. Examples of aquatic SNAs include small, isolated streams that contain remnant populations of Lahontan cutthroat trout (e.g., By-Day Creek, Mono County) and spring systems with unusual invertebrate assemblages (e.g., Bendorf Spring, El Dorado County). Many areas designated as research natural areas by the U.S. Forest Service also fit the definition of aquatic SNAs. Aquatic SNAs are not considered systematically in this chapter or in Moyle et al. 1996. This is not, however, a reflection of their importance in an overall strategy to protect aquatic biodiversity in the Sierra Nevada.

RESULTS

Forty-two potential ADMA watersheds were identified (table 57.2). They are widely distributed over the Sierra Nevada (figure 57.1). A description of each ADMA watershed is presented in Moyle et al. 1996. These watersheds contain sixty of the sixty-six major aquatic habitat types identified for the Sierra Nevada, with forty-nine of them represented two or more times. The habitats not covered by ADMAs either are lowland habitats that have been strongly affected by water diversions (e.g., Valley Floor River, Owens Lake) or are limited habitats that will need to be protected in SNAs (e.g., sphagnum bogs, Lahontan desert springs). Table 57.3 presents examples of potential SNAs.

The ADMA watersheds include habitats for most of the native fish and amphibians of the range. How well the native aquatic invertebrates are represented in the forty-two ADMA watersheds is not known, although it is likely that a high percentage of them are covered, given the distribution and size