GOLD DREDGING ON THE FEATHER RIVER

LORI STEVENS

They've been called "an eyesore, unsightly, offensive, Oroville's most prominent and least admired landmark," as well as an important cultural resource. The gold-dredge tailings of the Oroville State Wildlife Area have excellent integrity and demonstrate that even examples of environmental degradation may be important representations of local history. Although most of the original 8,000 acres of tailings were used to build the 770-foot Oroville Dam, the remaining 837 acres of tailings are an evocative historic landscape.

As part of the Oroville Relicensing Project, the Anthropological Studies Center (A.S.C.) set out to identify and evaluate the resources associated with the Feather River dredge field. The dredge field was created in the late 1800s through the mid-1900s by earth-moving machinery used to mine for gold in the gravels of the Feather River southwest of Oroville. The Feather River dredge field is located in and around the Oroville Wildlife Area. Pre-field research for the dredge field was conducted by looking at historic-period topographical maps and photo aerials of the area taken in 1998. The entire Oroville project area consists of nearly 41,000 acres. It was determined that the historic-period dredge field encompassed approximately 8,000 acres. About 6,000 of those are located in the Oroville Wildlife Area and also in the project area.

When the fieldwork started, what was found in the Oroville Wildlife Area was much different than what we had imagined. It seems that the dredge field was viewed as an environmental wasteland – an area devoid of resources – except of course for the dredge tailings. And with good reason. Looking at photographs of the dredge field and the operations of the dredges, one can see the obliteration of the terrain that the dredges worked. It appears extensive and complete.

The dredge field proved to provide quite a different and interesting story. Yes, we did find dredge tailings, and through historical research we found that, in fact, gold dredging in California had originated in Oroville on the Feather River. But we also found a massive complex of dam-construction resources and, amazingly enough, areas that had totally escaped modern-day exploitation.

A SHORT HISTORY OF DREDGING

Gold dredging was a fairly short-lived activity. It began in the Cromwell area of New Zealand in 1862 (Aubury 1905; Kirshenbaum 2000; Romanowitz 1970). The first dredgers were single bucket or spoon dredgers and were worked entirely by hand. Nearly all of these early dredgers were powered by paddle wheels driven by water current. A single-bucket steam dredge was build in 1870, and by about 1880 bucket-and-ladder dredges were introduced (Aubury 1905; Wagner 1980; Kirshenbaum 2000). With the advent of a steam-powered dredge, what previously had taken 25 workers to operate could now be handled by a five-man crew. The first steam-powered chain-bucket dredges were introduced about 1882. The first successful endless-chain bucket gold dredge in the United States was built in 1894 at Grasshopper Creek, Montana. (Citations?)

Although dredging had been attempted in Oroville and many other areas in California, it had proven unsuccessful. In the California State Mining Bureau's 1905 Bulletin, it is written that there were "bleaching skeletons of dredgers some of which were built half a century ago (Aubury 1905). Oroville provided a very workable place for successful dredging. The gravels in the reaches of the river below Oroville were loose and free from clay, the bedrock was soft, and there were no large boulders to hinder the dredges.

In 1895, Wendell P. Hammon was digging a well on his Rio Bonito Ranch south of Oroville. Hammon was a successful orchardist, but while digging the well he saw the gold shimmering in the sun and recognized the possibility of mining the gold-rich gravel deposits. In fact, the area was covered with pits where Oroville's Chinese population had long worked the river gravels for gold. It was Hammon's chance reading of an article in Scientific American that led him to be later called the California Dredge King. The article described a closely connected bucket dredge manufactured by the Bucyrus Company of Milwaukee. The Bucyrus dredge was being used to excavate the Chicago drainage canal, and that gave Hammon the idea that dredging just might be possible in California.

Wendell Hammon joined forces with Captain Thomas Couch, a financier who had recently sold his land holdings in the Montana dredge field, and they contracted with the Risdon Iron and Locomotive Works of San Francisco for a bucket-line dredge to be completed on February 1, 1898, at the price of $23,850.00. Hammon said that only after careful tests of the river gravels did he believe that there was sufficient profit to be made by dredging, calculating that there was enough gold in the gravels to garner 18 cents of gold per cubic yard. Later, when honored by the Engineers'? Club of San Francisco, Hammon said that once he sat down to calculate the value of gold to be had by dredging the Feather River, he "didn't know there was that much money in the world" (Hammon 1960).

Lori Stevens, Anthropological Studies Center, Sonoma State University; lvs333@earthink.net

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The principle of dredging is fairly simply but operates on a very large scale. The dredge would be manufactured in pieces and then delivered to the area where it was going to operate. A large pit was dug, the dredge was assembled in the empty pit, and then the pit was filled with water to make a dredge pond.

The dredge is simply a large barge with two large steel beams, called "spuds" or feet, attached vertically to either side of it. The spuds are alternately raised and lowered into the riverbed, and the dredge is attached to long cables anchored in the river gravels. This allows the dredge to move across dry land. The dredge has a continuous chain of buckets that dig up the earth – the river gravels are deposited in a trommel or spinning screen, where the material is washed and then sorted over a series of riffles. The smaller material is processed until only the fine, heavy gold particles are left. These particles are then amalgamated with mercury and the gold is collected. The unused cobbles and gravels are sent out the back of the dredge, up the rear stacking elevator and, with the help of water pressure, shoot out and away from the dredge, creating fanned tailing piles lined up on the landscape. As it moves across the land, it creates long tailing piles representing a single run of each dredge.

The early dredges were much smaller compared to later dredgers. The early ones could mine no more than 1,000 cubic yards a day, whereas the later, bigger dredges were capable of mining 15,000 cubic yards or 18,000 tons a day. The earlier-period dredge tailings are in mounds rather than the familiar fan pattern of the later dredge period.

Fiedwork Results

Dredge-Related Resources

Most of the remaining, intact tailing piles were found in the southernmost portion of the project area in the Oroville Wildlife Area. The topographical maps were very accurate in depicting the number of piles and the direction that the dredges worked. Using the geographical information system ARCView, we were able to overlay historic-period maps and determine that the dredge tailings also were sorted out by property ownership - so that was the approach we took out in the field. We divided up the remaining, intact dredge tailings as discrete activities by property boundaries.

Now, there are tailing piles, and then there are tailing piles, and we identified and recorded a lot of tailing piles in the wildlife area. The crew went out and found lots of tailing piles - some in not so great condition and some in great condition. The condition of the remaining tailing piles in the wildlife area is in direct correlation to access by off-road vehicles. There are areas that contain one or two intact tailing piles cut off to vehicles by surrounding ponds and there are some areas that contain multiple tailing piles that offer an outstanding view that truly evokes a feeling of being surrounded by the landscape as it must have been when the dredges were in operation.

We also located, identified, and recorded artifacts in the wildlife area. There are many bits and pieces of dredging equipment, some identifiable and some not. We found a lot of cables associated with the dredging activity, with various kinds of hardware attached, and several sections of trommels or revolving screens used to sort the gravels. We also found several "deadman anchors"; these large sections of trees were buried in the river gravels with cables wrapped around them, then attached to the winch wheels on the dredges so the dredges could move forward on their spuds. Out of the nearly 6,000 acres of dredge tailings that fell within the boundaries of the project area, slightly fewer than 1,000 acres remain. Most of those tailings are located in the southernmost portion of the wildlife area, and of those 1,000 acres, maybe half of that acreage is made up of dredge tailings that remain intact.

Dam-Construction Resources

Now, where did all the tailing piles go? This brings us to the second part of the story. In the 1950s and 1960s, when the Great California Water Project was being planned, the Oroville dredge field loomed as an infinite amount of aggregate to construct the 770-foot earthen Oroville Dam. A railroad was built out to the dredge field and for almost eight years, the material that the old dredges had turned over was collected and hauled away – 24 hours a day, five or six days a week. What was left on the ground and what we had viewed on the aerials during pre-field research were merely outlines of tailing piles left after the tailings were removed for dam construction. The outlines we saw on the aerials were created by willow species that had survived in the crevices found between two adjoining tailing piles.

The men who were building the dam adopted the technology designed by W.P. Hammon and others to gather the tailing piles. They constructed huge conveyor belts that transported the tailings to large hoppers, loaded them into railroad cars, and ran them up the valley to be dumped into an enormous pile that slowly-but-surely took shape, and finally created the Oroville Dam, the tallest dam in the United States. Approximately 7,000 acres of tailings were used to build the dam.

Non-Dredge and Non-Dam Construction Resources

Still, amazingly enough, among the annihilation of this landscape and after decades of heavy earth-moving machines, it was found that small areas had, for one reason or another, evaded the wraith of the dredges - whether dredging for gold or dredging for dam material. Again looking at three different resources –historic-period topographical and other maps, and 1998 aerial photos, it was obvious that there were indeed areas that appeared undisturbed. These areas were found along the edge of the dredge field, and a few small pockets were found in the interior of the dredge field.

One area in particular was very interesting. There was a small triangle that showed up on the historic-era topographical map that had no dredge tailings represented on it. There is a house and road depicted on the 1952 topographical map. This area was located in the northern part of the dredge field where the tailings had been removed for dam construction, but it appeared from historic-period maps that the area not dredge had once been a part of Williamson's Field noted on an 1856 GLO. It appears that once the Township and Range format was applied

to the western United States, this small triangle of Williamson's field remained intact. At this time, the property ownership that caused this small section of land to remain un-dredged has not been determined, but by overlaying the historic-era topographical map and the 1856 GLO, we see that the area clearly matches up. The area was field–checked, and several cherry trees and fig trees were found growing out of the undisturbed flood plain. It's possible that this is one of the oldest historic-period sites in the entire project area.

Another area that remained undisturbed was the Davis Ferry landing located at the outlet to the Thermalito Afterbay. A 1952 topographical map shows that there should have been dredge tailings here. The area was surveyed and found to be intact. The ferry landing had survived the dredging activity, and an old oak grove with trees 3-5 feet in diameter were found here rather than piles of tailings. Davis Ferry landing offers an enticing location for further study, as does the area of Williamson's Field.

CONCLUSION

So, in conclusion, the tailing piles left by the dredges are few, but many remain in their original state — and even though the resources in the dredge field have been used and reused, and many of the dredge tailings are now located more than 10 miles away from their original home, there is more to the story than total environmental degradation. The area provides us with a modern industrial landscape with many facets representing a long history of use.

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