EARLY CONDITIONS AND HISTORY OF THE UPPER RUSSIAN RIVER

The Indians called it Shabaikai or Misallaako, meaning "Long Snake".[1] The Pomo Indians of the Ukiah Valley called it simply the River. The Spanish called it the San Ygnacio River. The Russians called it Slavianka, or "little Slavic maiden."[2] But, in an 1843 Spanish petition for the Bodega grant, the name appeared as Rio Russo,[3] and we have called it the Russian River ever since.

This paper discusses the characteristics and history of the upper Russian River, (basically the section located in Mendocino County), and the effects of man's activities upon it. It is impossible to determine what specific actions produced which observed effects on the Russian River. But special attention is given to possible reasons for downcutting, siltation, non-native plant infestation, riparian devegetation, and fish habitat degradation--all in the light of what methods people were using over the years to alter the river area for reasons of flood control, farming, irrigation, water storage, gravel extraction, recreation improvement, improving fish life for sportsmen, sewage disposal, and many more possible purposes.

GEOLOGY, SETTING

The Russian River flows southeastward through the valleys of the Northern California Coastal Ranges, from its Mendocino County headlands north of Redwood Valley to its mouth at Jenner in Sonoma County. The total watershed area is 1485 square miles, and over 500 square miles of that are in the upper river watershed. The length of the river itself is 116 miles, about 52 miles of which are in Mendocino County.

There are three natural subdivisions to the river:[4]

1) The upper river, flowing in a fairly straight course, from its source through the Ukiah Valley and through the narrow gorge south of Hopland;

2) The middle river, from Cloverdale to Healdsburg in the Alexander and Santa Rosa Valleys; and

3) The lower river, where the Russian River turns abruptly westward from its straight course and winds through canyons to the ocean at Jenner.

The upper Russian River is underlain by Central Franciscan melange of Jurassic-Cretaceous age (over 130 million years old). Along the eastern side of Ukiah Valley, from south southeast to north northwest, runs the recently active Maacama Fault.[5] This strike slip line of weakness runs closely parallel to the Russian River. It crosses the river just east of The Forks and west of Coyote Dam, then runs northward along the west side of Redwood Valley, up toward Willits.

Uplifted old terrace deposits can be seen along the east side of the Russian River, from The Forks down through Talmage. The old valley floor north of Ukiah is buried 1000 feet below the principal high terrace level.[6] The riverbed and valley floor of today are

about 200 to 400 feet below this high terrace, at approximately 600 feet in elevation.

There is an interesting physiographic feature of the upper Russian River. At one time Clear Lake drained westward via Scott Creek (a former tributary of Cold Creek) into the Russian River; but hundreds of years ago an immense landslide blocked off that outlet, diverting Scott Creek to Clear Lake. Cold Creek continued flowing into the East Fork of the Russian River. It is possible, then, that hundreds of years ago the Russian River had a greater flow of water than it did when white men arrived in the early 1800s.

A 1914 account stated that the soil of Ukiah Valley consisted of river loam, black clover land, and gravelly wash from the hills, which also consisted of a gravelly, sandy formation.[7] The vegetation of the Russian River valley consisted of "coastal prairie," "oak savannah", and "northern coastal scrub."[8]

The eastern hills were covered with brush, which the first settlers used for grazing their cattle and sheep. On other hills grew several kinds of oak, fir, pine, madrone, tan oak, chestnut oak, and manzanita. Small stands of redwood grew in a few of the stream heads on the western side of the valley, but they were practically exterminated by 1913.[9] Smaller woods included hazel, chemissal, blue blossom, mountain mahogany, nutmeg, yew, and laurel.[10] Some white oaks in the valley had trunks 6 feet in diameter and were 150 feet high. Golden oaks in the canyons were 4 feet in diameter and also 150 feet high. Blue oak grows over much of the Laughlin soils in southeastern Mendocino County.[11]

The California Indians who inhabited the coastal prairie used an annual fire regime which may have contributed to the prairie condition. "An early description of the Russian River valley near the Sonoma Co. coast mentions 'a great wide area of waving grasses higher than a man's head with deer, bear, and other big game everywhere...'"[12] These high grasses may have been Danthonia californica, which is now scarce, or Deschampsia danthonoides and Pleuropogon californicus, which were common in wet meadows from Ukiah to Oakland, and/or a number of other tall grasses still present in the area.

EARLY CHANGES TO THE RIVER

> Four major factors contributed to drastic changes in the distribution and composition of pristine coastal prairie: the introduction of highly competitive, exotic species, an increase in grazing pressures, the elimination of annual fires, and cultivation.[13]

The first agricultural development began in the Ukiah valley around 1850 to 1860, with stock raising, grain and hay.[14] Stephen Warren Knowles grew the first hops in the county in 1850.[15] In 1864 some tobacco was grown but soon disappeared. Coyote Valley Flour-mill was built in 1860, but a flood in 1961 wrecked it.

After William J. Cleveland rebuilt it in 1864, he processed four tons of wheat per day through the harvest![16]

Since there was no way to get fresh produce to the San Francisco markets without having it perish, agricultural products were confined to the local market. But when the Northwestern Pacific Railroad was completed in 1889, prunes, potatoes, pears, and hops could be grown and sent to San Francisco. Wine grapes were also planted, and irrigation was practiced on a small scale. Alfalfa was grown for hay to feed horses and sheep. Even into the 1950s hops, pears, prunes and grapes were still the most widely planted crops in the Ukiah Valley.

Water from "Forsyth's creek" was brought to Gold Gulch, Just north of The Forks, for gold mining.[17] About 9 miles north of Calpella, on "Redwood Creek", Thomas Elliott in 1858 built a sawmill. Driven by water, it had a sash saw.[18] After the railroad was completed, more lumber mills sprang up around Ukiah. Lumbering became the major industry in Mendocino County as trains took redwood saw logs and boards south.

EEL RIVER WATER TUNNEL

In 1908 the Snow Mountain Water and Power Company built Cape Horn Dam on the Eel River, diverting water into a transbasin tunnel through the mountain. They used the water to power a new electrical power plant in Potter Valley. The spent water, averaging 175,000 acre-feet per year, was discharged into the East Fork of the Russian River.[19] This action not only allowed for irrigation of more croplands in Potter and Ukiah Valleys, but it contributed to further municipal and industrial development along the river.

In 1922, in order to have better control over water flow, the Snow Mountain Water and Power Co. built Scott Dam and Lake Pillsbury about 12 miles upstream of Cape Horn Dam and the Van Arsdale Reservoir. Silting has reduced the storage capacity of this reservoir from 94,000 acre feet to less than 85, 000 acre feet, but diversions into the Russian River basin in 1969 still ranged between 83,000 and 221,000 acre feet.[20]

PRE-COYOTE DAM CONDITIONS

In the early 1900s, according to Stan Hildreth,21 quail and other game birds were plentiful. People would trap coons, skunks, rabbits, foxes and river otters. Riparian flora included willows (both native river willows and, later, imported yellow willows), wild grape vines, oak, pepperwoods (also called myrtlewood or bay laurel), cottonwoods, and black walnut. Wild oats grew tall in the untilled areas, and sweet anise was a native plant. But in the 1930s or so, Medusa head and Johnson grass (which sends out underground roots) came in. There was no star thistle nor "goat head" yet.

Hops were a major crop and required much additional labor for harvest. People from all around, even Point Arena and San

Francisco, came to work in the harvest. Whole families would camp by the river. The children would play in the river while their mothers kept camp nearby and the fathers were in the fields. Ruth Kington related:

> Everybody went and picked hops. White and Indians and everyone. It was fun. They'd go out and camp... They would have fun in the field, they'd sing and play around and work. Make maybe a couple of dollars a day. That was good money for those days.[22]

David Sagehorn remembered:

> Everybody would get their chores done in the morning and they would go down to the river and play and dive and swim under water.... Those were great days when we had all these people enjoying the river. Everything was neat and orderly. There were no beer cans or anything like that. All the garbage was carefully taken care of.... It was just a real Jolly inexpensive recreation and camping for families that didn't have much money to spend.[23]

FLOODING

The Russian River flooded quickly during the winter season. The river bed then was shallower then, about 8 to 12 feet higher than it is today, so it was not contained in a channel. "We used to be able to drive across it almost any place you wanted. You can't do that anymore," said Morgan Ruddick.[24] Stan Hildreth said the river would come up with the rains and go down repeatedly through the winter.[25] According to another old-timer, Ray Schultz, it would rain through the whole winter:

> When it got started [the rain] didn't know when to stop. When we had lots of rain, all of East Gobbi Street, from where the freeway overpass is now, to the eastern mountains, would be under water except for a few high spots. The Russian River, from where East Perkins crossed to the Talmage Bridge, would grow up with willows so thick they would choke the free flow of the water, and it would back up almost to where the Freeway is now.[26]

Other areas would flood up to the railroad tracks in Ukiah. The floods, however, were of short duration (a few days) across the agricultural fields, because the waters would drain into numerous meandering sloughs. Examples of sloughs are the low areas around Mill Creek in the Talmage area and the present day Fetzer vineyards just north of Hopland. David Sagehorn said that the sloughs "had large bunch grasses and climbing wild grape vines up in the oak trees and ash trees."[27]

"The farmers had to farm around the sloughs," said Nelson Redding.[28] "They didn't have the machinery to level the land the way we have in the past few years." As farming equipment improved, farmers extended their croplands closer and closer to the river,

thereby removing more of the riparian vegetation. "Aerial photographs indicate that considerable land covered with riparian vegetation has been converted to farmland since 1940."[29]

Redding further stated, "Even in those years the farmers would work on the river banks as part of their farming activities. They would cut the trees and make barriers to stop erosion." In his youth, Nelson often worked on river maintenance by cutting poles and driving pile along the river, "to get the river back in its channel."

In 1949 five ranchers in the Vichy Bridge area, who had suffered great loss of land from flood waters, removed an entire island 150 feet long from the middle of the Russian River.[30] In hopes of keeping the river in its channel, they used trees, roots and stumps from the removed island to form a new bank 100 feet back, forming a wider river bottom.

Other farmers commonly dumped brush, old tires and wrecked car bodies, even refrigerators into the river to try to stabilize the banks. Farmers who did not approve of those methods planted willows or non-native tamarisk, reed cane, or Himalayan blackberry along the banks.[31]

COYOTE DAM AUTHORIZATION

However, several years of exceptional flooding (1924, 1925, 1926, 1931, 1935, 1936, and 1937, for example)[32] brought an outcry from valley residents which was heard in Washington, D. C. Local interests began trying to get authorization from Congress for construction of a dam. With the Flood Control Act of 1937, the Department of the Army requested the District Engineer, San Francisco District, to make a preliminary report:

> A report on the preliminary examination of the Russian River for flood control was submitted by the district engineer on May 18, 1939... the district engineer submitted, on January 30, 1941, a survey report on the Russian River for flood control and related matters. The Board of Engineers for Rivers and Harbors was not convinced of the advisability of the United States undertaking the improvement recommended therein.[33]

Near the end of World War II, however, it became apparent that water conservation was as important a reason as flood control for constructing a dam. Sonoma County needed an additional source of water for its agriculture and increasing population. The resulting low summer flow was damaging its recreational industry.[34] On July 3, 1944, Mendocino and Sonoma County interests requested that the Russian River study be reopened.

Further, more extensive studies were conducted by the Army Corps of Engineers. (Stream gaging stations had been set up in the Russian River drainage basin in the 1939-40 season.)[35] Changes, developments, and further negotiations went on between Mendocino and Sonoma Counties. But it was not until May 9, 1950 that the Lake Mendocino Project was actually authorized by Congress, as part

of the Flood Control Act.

SURGE OF GROWTH

After World War II the population of Mendocino County increased by 43%, from 27,864 in 1940 to 39,396 in 1950. Ukiah itself grew from 3700 people in 1940 to 8000-8500 people in 1950. The old county courthouse was torn down and a new one built, streets in Ukiah were widened and paved, the Mendocino County State Hospital in Talmage had three million dollars worth of new buildings constructed, Frank Zeek School was built to relieve the overcrowded classroom conditions, new housing developments were built, Giorno recreation and ball park was constructed, extension of Highway 20 to the coast was proposed, the State Drive-in Theatre was opened, and new businesses opened up all along the "Redwood Highway. "[36]

Many of the Jobs were considered to be temporary, and it was thought that most workers would leave the area after the jobs were completed. But a 1950 survey found that many "temporary" workers intended to stay in Ukiah after their jobs were completed.[37] The city council of Ukiah and the Chamber of Commerce worked hard to meet growth demands. Police, fire and public utilities, such as water, sewage, electricity and gas services, all had to be expanded.[38]

A group of women even formed a federation to appeal to the county board of supervisors to stop the unsightly, unauthorized dumps around the county.[39] Furthermore, in 1950, some of the streams and wells north of Ukiah were found to be polluted by seepage from septic tanks and refuse dumps on or near the Russian River.[40]

Then in 1948 to 1950 Masonite built its hardboard plant in Ukiah and a paved logging road westward out to its 55,000 acres of newly purchased forestlands.[41] Masonite used gravel from Ackerman Creek north of Ukiah to pave its highway. As a result, the State Highway Division in 1950 had to reinforce the Ackerman Bridge, because its foundations were weakened "as gravel from beneath the bridge was carried downstream."[42]

GRAVEL EXTRACTION

The production of sand and gravel was the principal mining industry in Mendocino County in the early 1950s. In 1950, 254,413 short tons of sand and gravel were produced.[43] Gravel from the Russian River streambeds was used for concrete construction and for building and repairing roads. It supplied the entire Bay Area, and the river was greatly overextracted.[44]

In 1952 three plants were "operating on bars on the Russian River in the vicinity of Ukiah":[45]

1) The Ford Gravel Company was located on the west bank of the river about 1 and 1/2 miles northeast of Ukiah, in section 9, T 15 N, R 12 W, MD (Mount Diablo). This operation, owned by Milton

Ford and Edward Walsh, was a crushing and screening plant and a concrete batching plant.

2) Sid Jones and Tom Caldwell, on the east bank of the Russian River south of Ukiah in sec. 28, T 15 N R 12 W, MD., operated a hot asphalt road-mix plant.

3) The Ukiah Gravel and Cement Company, Incorporated, was on the east side of the river about a mile southeast of Ukiah in sec. 28, T 15 N, R 12 W, MD. This operation, with John Freitas as president, was a sand and gravel screening plant, a concrete batching plant and a hot road-oil plant.

Gravel extraction on the upper Russian River, over the years, has impacted the river in several ways:[46]

* Gravel deposits have been depleted so that clay underlying the gravel has been exposed in Forsythe Creek and in the Russian River near Calpella.

* Streambank erosion is increasing along Feliz Creek near State Highway 101 and along the lower reaches of Forsythe Creek. Farmland and residential land is being lost due to the bank erosion in the Feliz Creek, Forsythe Creek, and Russian River watersheds.

* Eroding clay and silt overburden from gravel pit walls in upper Robinson Creek is adding fines to the stream and its spawning gravels. This may be detrimental to fish.

* Structures such as bridges and water pipes are being damaged by lowering of streambeds (thalwegs).

COYOTE DAM CONSTRUCTION

Work on Coyote Dam began July 24, 1956.[47] The Guy F. Atkinson Company of South San Francisco was awarded the $7,467,750 contract for construction of the dam, plus $310,530 for construction of three large gate units for control of the flow of water through the conduit of the dam.[48] The first concrete work was poured in September for the conduit.

The dam was constructed of fill material excavated from the spillway section (impervious core) and from a borrow area in the reservoir area adjacent to the dam. The quarry rock riprap was from a quarry approximately seven miles upstream from the dam on the East Fork.[49]

The Army Engineers planned to clear a strip of land in Coyote Valley from the 700-foot to the 745-foot elevation around the perimeter of the reservoir.[50] But residents were concerned over trees, stumps and other debris beneath the proposed water level which would pose a hazard to swimmers, fishermen and boaters. So in the summer of 1958 volunteers cleared as much of the basin as they could. Cutting down riverside trees and orchards, they gathered and burned the debris.[51]

Besides clearing the basin, it was also necessary to reroute Highway 20, which had passed through Coyote Valley for over a hundred years. Work on the project to reroute Highway 20 from Calpella to Cold Creek Canyon began February 12, 1957.[52] Three bridges were built --over Redwood Valley Road, over the Russian River at the lower end of the valley, and over the East Fork of the Russian River in Cold Creek Canyon.[53] The new 4 and 1/2-mile stretch opened June 26, 1958.[54] The final cost of the reroute project was three and a half million dollars![55]

Once the new road was in, Coyote Valley could be flooded. The winter of 58-59 provided the first waters for Lake Mendocino. Between January 2 and February 18, 1959, the water level rose from 668 feet in elevation to 737 feet, and the storage capacity increased from 4,130 acre feet to 60,080 acre feet.[56, 57] At conservation level the lake contains 72,300 acre feet, but 122,500 feet can be contained before water would flow over the spillway.

As the dam neared completion, other negotiations for water rights, recreation concessions, and other activities were going on. The State asked Sonoma and Mendocino counties to specify what flows they wanted at certain locations along the river. They said 25 cubic feet per second (cfs) just below the dam should be adequate, and 150 cfs at the juncture of the east and west forks of the Russian River about one mile below the dam. Guerneville needed 125 cfs to maintain its fishery.[58]

Fish and Game proposed a concrete plan for protecting fish life in the Russian River, asking for adequate release of water in the critical fall months, when there are major fish runs. It was understood, however, that in dry years water rights have priority over fisheries.

Interestingly, the Department of Fish and Game began a "trash" fish eradication program in 1954 in the Russian River from Healdsburg to the East Fork above Ukiah. They sprayed a poison called Rotenone, which suffocated the fish by affecting their gills.[59] The purpose was experimental and the first large-scale treatment of its kind in the country. It was done with the idea that predators and the competition for food and living space would be eliminated for the sake of the desirable fish, by killing off the undesirable non-game fish. Squawfish, suckers, roach, carp, hardhead minnows, green sunfish, lampreys, smallmouth bass, and Steelhead trout--nearly all the fish in the river--were killed.

There was also some loss of migratory game fish.[60] Some people felt that this program benefitted the Steelhead fishing in the lake and in the Russian River.[61]

In summer, the Russian River previously consisted of a series of disconnected deep pools, warmed by summer sun, which harbored many small fish, and in which people would swim. Now the constant, cooler flow of water from Coyote Dam affects summer fish habitat and increases erosion along the banks. Bill Townsend feels that the constant releases of water from the dam cause the river to be silted over its gravel bed most of the time, so that "the spawning habitat is all gone".[62] Not only that, he says, but farmers don't properly screen their pumps; this also affects the fisheries.

CHANNEL STABILIZATION METHODS

Since October of 1956,[63] the Army Corps of Engineers have done various types of channel improvement work. Five contracts for nine projects, funded by the Federal Civil Defense Administration, were awarded to four contractors for emergency channel flood damage repair work from Ukiah to Hopland in 1956.[64] The attempts were to restore the channel to its "pre-flood location." However, it can be seen that the "pre-flood location" was a result of the typical summer situation, and the "flood location" would then be just a result of the usual winter situation.

Work included both flexible and stationary works, vegetative barriers, and levee repairs:[65]

* The flexible fence has been an effective protective measure, because silt gets deposited in the brush fill behind a galvanized wire mesh facing, which is secured by steel posts and anchor stakes. New vegetation, such as cane, vines and brush grow from the silt and the bank. After several years, the previously eroding bank may be well concealed and protected from further erosion.

In 1956, an 800-foot long test section of flexible fence was installed against the right bank of the Russian River between river miles 55.9 and 56.1 (in Sonoma county).[66] After 14 years, much of the fencing was well concealed by new vegetation, but other sections were still visible.

* Steel jacks are shaped like the Jacks in the same-named game, but they are made of three 16-foot long steel members, welded perpendicular to each other, connected to other jacks with cable, and anchored in concrete. These structures are often visible for years after installation, because they are placed along a bank which has been completely wiped out and where vegetation no longer exists; so it takes many seasons for accumulated debris and vegetative camouflage to develop. Jacklines must also be continually maintained until satisfactory stabilization is achieved. Meanwhile, they pose a significant hazard to canoers.

* Stationary works consist of riprap revetment, dumped rock, temporary wood pile structures, or wire-mesh and gravel blanket type structures. Riprap is quite costly and detracts from the natural setting, but it generally provides good channel control. Dumped rock is fairly inexpensive and useful for small, troublesome sites. Single or dual row wood piles must usually be replaced every 10 to 15 years, but it looks very natural. The wire mesh and gravel blanket may develop a growth of bank grasses, brush and small trees; but it still has limited strength against main river currents.

* Willow trees planted in rows along the toe of a bank, tied together and anchored by cables are called tree pendents. These vegetative barriers have had varying degrees of success, because

erosion behind the pendents have often prevented them from rooting. Plantings of willow sprigs often failed to keep the banks secure, partly because of gravelly soil and partly because of improper timing, selection and techniques used for planting of the willow sprigs.

* Levee work consists of first clearing and grubbing the area to be filled, then constructing the breaks & levee section.

Levee repair work was contracted by the U.S. Army Engineer District, San Francisco Corps of Engineers, in 1956. The work was located on the west bank of the Russian River about two miles north of Hopland, on the J.C. Pomeroy property. Material for the repair was obtained from stockpiles on the Pomeroy property.[67]

All these methods have been used over the years in attempts to control and stabilize the Russian River channel. Areas worked extended from the base of Coyote Dam to the southern Mendocino County border. However erosion, flooding and degradation of the river have continued.

Dianne Chocholak
Mendocino County Water Agency
June 15, 1992

ENDNOTES

1. Lawrence R. McDonnell, ed., PG&E Progress, "Rivers of California", 1962, 19.

2. Gaye LeBaron's Notebook, "The River as seen through the artist's eye", Santa Rosa Press Democrat, March 4, 1990.

3. Lawrence R. McDonnell, ed., PG&E Progress. "Rivers of California", 1962.

4. Ruliff S. Holway, ed., "The Russian River, A Characteristic Stream of the California Coast Ranges", University of California Publications in Geography, vol. 1 (Berkeley: University of California Press, 1913-1917).

5. Harding-Lawson Associates, U.S.G.S. Map, Ukiah Quadrangle, "Ukiah, California, Recently Active Breaks Talmage Fault zone" 5-26-77. From Maacama Fault Study, U. S. Army corps of Engineers, January, 1978.

6. California Division of Mines. Bulletin No. 179, 1960, 54.

7. Aurelius 0. Carpenter & Percy H. Millberry, History of Mendocino and Lake Counties, California, (Los Angeles: Historic Record Co., 1914), 69.

8. Michael G. Barbour, & Jack Major, editors, Terrestrial Vegetation of California, (New York: John Wiley & Sons, 1977).

9. Aurelius 0. Carpenter & Percy H. Millberry, History of Mendocino and Lake Counties. California, (Los Angeles: Historic Record Co., 1914), 70.

10. Aurelius O. Carpenter & Percy H. Millberry, History of Mendocino and Lake Counties. California, (Los Angeles: Historic Record Co., 1914), 70.

11. Michael G. Barbour and Jack Major, editors, Terrestrial Vegetation of California, (New York: John Wiley and Sons, 1977), 392.

12. Ibid., 736.

13. Ibid.

14. Edward F. Carpenter, Water Use Survey on the Russian River in Southern Mendocino County, 1958.

15. Neil Joyce, "Hop Ranching in Mendocino County is Large Business", Redwood Journal-The Press Dispatch. August 30, 1950, 7.

16. Lyman L. Palmer, History of Mendocino County. California. (San Francisco: Alley, Bowen & Co., 1880), 446.

17. Ibid., 128.

18. Lyman L. Palmer, History of Mendocino County, California, (San Francisco: Alley, Bowen & Co., 1880), 446.

19. Decennial Report, Russian River Water Project. 1959-1969. Sonoma County Water Agency, 1969.

20. Sonoma County Water Agency, Decennial Report, Russian River Water Project 1959-1969. 2.

21. Stan Hildreth. Personal interview by Mrs. Dianne Chocholak, January 21, 1992.

22. Bruce Levene, Mendocino County Remembered, an Oral History, v. 1, (Ft. Bragg: Mendocino County Historical Society Publications, 1976).

23. David Sagehorn. Personal interview by Carlyn Rohrig, April 13, 1992.

24. Morgan Ruddick. Personal interview by Carlyn Rohrig, April 3, 1992.

25. Stan Hildreth. Personal interview by Carlyn Rohrig.

26. Annette Parks, ed., "Tales from the trunk--Floods near Ukiah, " an account by Ray Shultz of Redwood Valley, Ukiah Daily Journal, January 28, 1976.

27. David Sagehorn. Personal interview with Carlyn Rohrig, April 13, 1992.

28. Supervisor Nelson Redding. Personal interview by Carlyn Rohrig, March 9 1992. This account has many interesting details of erosion and flood control methods used years ago, as well as changes in the Russian River since Coyote Dam was built.

29. "Appendix A: Gravel Mining and Sediment Influx" to a publication on the Russian River basin. Citation and date are unknown, but approximated at sometime after 1980.

30. Ukiah Republican Press, "Five Ranchers Create Flood control on River Bank Acres", April 20, 1949.

31. Richard Ruddick. Personal interview by Carlyn Rohrig, April 17, 1992.

32. House Document No. 585. "Russian River, Calif., Letter from the Secretary of the Army," (United States Government Printing Office, Washington: 1950), 26.

33. Ibid, 10.

34. Decennial Report. Russian River Water Project. 1959-1969. Sonoma County Water Agency, 1969, 18.

35. Ibid. , 25.

36. Ukiah Republican Press and Redwood Journal-The Press Dispatch, various articles from January, 1949 to September, 1950.

37. Redwood Journal-The Press Dispatch, "Survey Exposes Housing Crisis", September 2O, 1950, 2.

38. Redwood Journal-The Press Dispatch, "How City Has Met Expansion Demands", April 7, 1950.

39. Redwood Journal-The Press Dispatch, "Women of County Federation Gird For Campaign Operation Garbage Dumps", August 2, 1950.

40. Redwood Journal-The Press Dispatch, "Water Pollution Board In Investigation Of Water Supplies In Mendocino", September 6, 1950.

41. Redwood Journal-The Press Dispatch, "Masonite Production Manager is Selected", February 8, 1950.

42. Redwood Journal-The Press Dispatch, "Ackerman Bridge Being Reinforced", January 30, 1950.

43. State of California Department of Natural Resources, California Journal of Mines and Geology, Volume 49, Number 4, (San Francisco: Division of Mines, October, 1953), 367.

44. Nicholas King, "Rocks, Regs, and Rivers, An Interview with Robert & Randy Swegle", Ridge Review. December, 1991, 7O.

45. State of California Department of Natural Resources, California Journal of Mines and Geology, Volume 49, Number 4, (San Francisco: Division of Mines, October, 1953), 367.

46. Department of Water Resources, Central District, Upper Russian River Gravel and Erosion Study, in Cooperation with Mendocino County, May, 1984, 8-9.

47. Ukiah Daily Journal, "Coyote Dam Lake Mendocino", June 4, 1959, 2.

48. Ukiah Daily Journal. "Coyote Work Starts, Modern Machinery Speeds Work", September 28, 1956.

49. D.A. Dennis, Department of the Army, U.S. Army Engineer District, Sacramento Corps of Engineers, letter to Mendocino County Water Agency dated April 1, 1992.

50. Ukiah Daily Journal, "Engineers Clarify Plans to Clear Coyote Reservoir", October 12, 1956.

51. Ukiah Daily Journal, "Coyote Dam Clearing Under Way", July 14, 1958.

52. Ukiah Daily Journal, "Coyote Dam Lake Mendocino", June 4, 1959, 2.

53. Ukiah Daily Journal, "Highway 20 Close to Completion", March 31, 1958.

54. Ukiah Daily Journal, "East Meets West", June 26, 1958.

55. Ukiah Daily Journal, "New Highway 20 Will Open to Traffic on Thursday", June 20, 1958

56. Ukiah Daily Journal, "Lake Rapidly Filling As Downpours Continue", January 12, 1959.

57. Ukiah Daily Journal, "Winter Storms Rapidly Filling Lake", February 18, 1959.

58. Ukiah Daily Journal. "Water Releases from Coyote Dam for Fish Asked by State", November 12, 1956.

59. Ukiah Daily Journal, "Bureau of Fisheries Rids the River of 'Trash' Fish", October 8, 1957.

60. Ukiah Daily Journal. "Hearing on Russian River Chemical Treatment Set", August 12, 1958.

61. Richard Ruddick. Personal interview by Carlyn Rohrig, April 17, 1992.

62. Bill Townsend. Personal Interview by Carlyn Rohrig, April 1O, 1992.

63. "Coyote Dam Lake Mendocino", Souvenir Edition Ukiah Daily Journal, June 4, 1959, 6.

64. Ukiah Daily Journal, "Ukiah-Hopland Russian River Channel Flood Damage Repair Work Started", September 14, 1956.

65. U.S. Army Engineer District, San Francisco, Corps of Engineers, Russian River Basin (Channel Improvement and Bank Stabilization) Sonoma and Mendocino Counties. California. Draft Environmental Impact Statement, February, 1972.

66. Ibid., 13.

67. U.S. Army Engineer District, San Francisco Corps of Engineers, Specifications, Russian River. Rehabilitation of Channel Improvements and Levee Repair. Sonoma and Mendocino Counties, California, 4 August 1966., 4.1.