The Russian River

An Assessment of Its Condition and Governmental Oversight

Sonoma County Water Agency

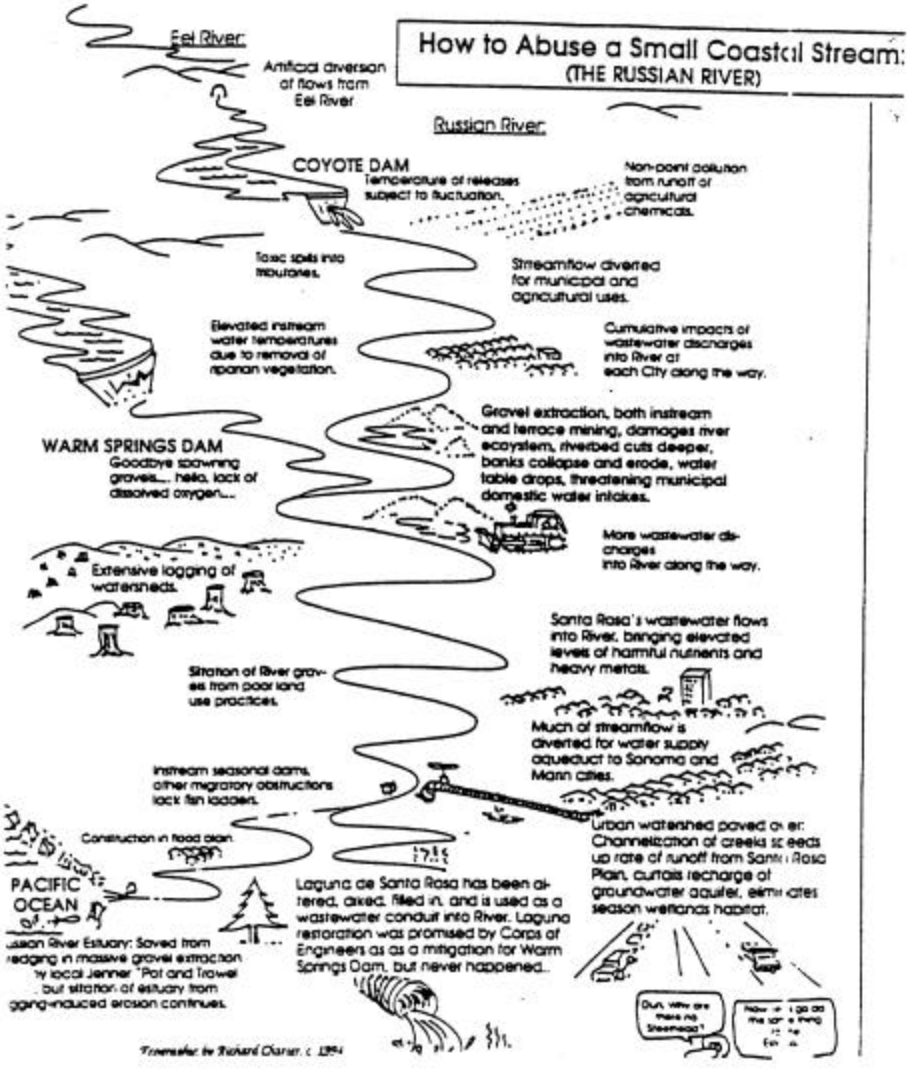
By Robert F. Beach

Santa Rosa, California August 1996

Preface

Statements that the Russian River has been allowed to decline to the point of crisis have been made for many years and are becoming increasingly common. The asserted decline is often attributed to a lack of both vision and action on the part of local, state and federal agencies having jurisdiction over the Russian River's natural resources. More recently, these concerns have been accompanied by a call for the development of a comprehensive management plan to address the perceived ills of the Russian River, and for state and federal action to assist in financing the preparation of the plan.

The following "ecographic" by Richard Charter graphically expresses the view held by a number of people of how the Russian River has been abused.



American Rivers, Inc., a national river conservation organization, in their list of "North America's Twenty Most Threatened Rivers of 1996", ranked the Russian River as the 15th most threatened river in North America. The Natural Heritage Institute, a law and consulting firm in resource conservation, in *a* June 5, 1996 letter to Gray Davis, Chairman of the State Lands Commission, James M. Strock, Secretary for Environmental Protection, and Douglas P. Wheeler, Secretary of the California Resources Agency, acting on behalf of the Friends of the Russian River, which is another river conservation organization, asked the State to adopt a plan for long-term management, including restoration, of the Russian River fisheries and their habitat.

The preparation of this document was commissioned by the Board of Directors of the Sonoma County Water Agency, by Resolution No. 95-0456 adopted on April 18, 1995, to synthesize the existing data, studies and reports on various aspects of the Russian River into a single document which summarizes the current condition of the river. The purpose of this document is to provide a factual basis for the Board of Directors and other public policy makers 1) to describe, as completely as available information permits, the current condition of the Russian River; 2) to define the jurisdiction, and generally describe the most significant programs that various local, state and federal government agencies are currently involved with in addressing problems affecting the Russian River; 3) to determine the need for a comprehensive planning effort, or other means to improve interagency communication, coordination and cooperation; and 4) to identify any problems which are not currently being adequately addressed in order to facilitate the rational allocation of the resources which are available, or which may become available in the future.

The areas of concern which are examined include 1) water supply, from both the main stem of the Russian River and Dry Creek, and their tributaries; 2) water quality; 3) recreation and public access; 4) gravel mining; 5) the abundance of the anadromous and warm water fishery, including both hatchery and naturally propagated fish; 6) barriers to fish migration; 7) riparian habitat; and 8) flood and erosion control activities.

Footnotes are utilized in this paper, rather than the more commonly used endnotes or parenthetical references, to allow the reader immediate access to the reference without having to search for it. In the case of the work of one author as found in that of another, particularly where the secondary source is a report prepared by or for the Sonoma County Water Agency, the citations of the works do not include the original source (or more often, multiple sources). In these cases, the reader is referred to the Sonoma County Water Agency reports themselves for a full list of references.

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Part 1, Condition of the Russian River
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INTRODUCTION

In 1980 the California Department of Water Resources funded a study by the University of Arizona's Laboratory of Tree-Ring Research. The study reconstructed California's annual precipitation since the year 1600. It found a drought that lasted more than 50 years, between 1760 and 1820, which was drier than the 1928 through 1934 period upon which the firm annual yield determination of California's major water projects is based. Other long dry periods identified in the tree ring study included a 20-year period between 1865 and 1885.1

As one would expect, watershed runoff is also highly variable, being affected by both precipitation and precedent watershed conditions. The annual flow of the Russian River at Hacienda is shown in Graph 1-I-1 for the period for which records exist, 1940 through 1994. During this period, the mean annual flow was 1,609,000 acre-feet with the extremes varying from 4.0 percent of normal (1977) to 265 percent of normal (1983).[2]

Before proceeding, is important to draw *a* distinction between appropriative water rights and the water itself. In California's arcane system of water rights law, the appropriative water right is the dominant right, and this is clearly the case in the Russian River service area. The basic principle of the appropriation doctrine embodied in appropriative water rights law is "first in time, first in right." The person who first appropriates water and puts it to beneficial use has a right superior to later appropriators. In water short periods, junior appropriators can have a water right and yet be barred from exercising their right in order that the rights of earlier, senior appropriators, may be exercised. The subsequent analysis of the adequacy of the Russian River water supply is made without regard to whether or not some extractions could be reduced or barred outright by legal process for lack of adequate water rights.[3]

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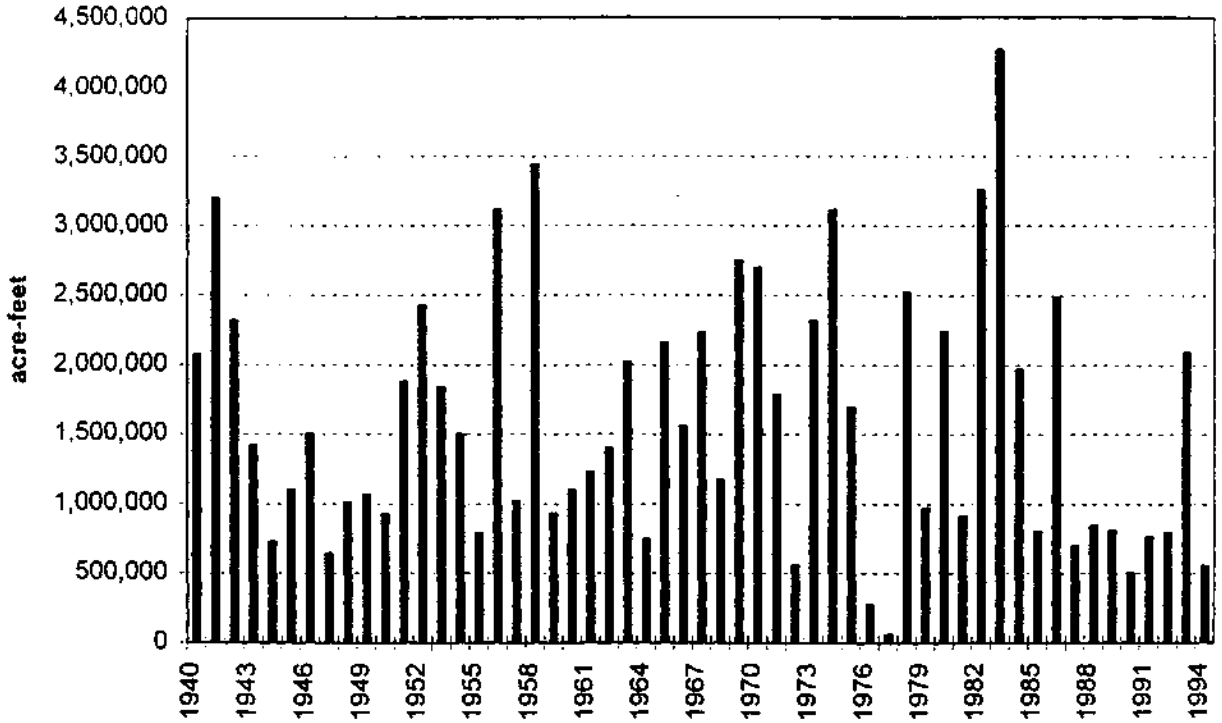
[1]Sonoma County Water Agency, Urban Water Management Plan (Draft), February 1996. IV-13.

[2]United States Geological Survey, Water Resources Data, California, Water Year 1994, Volume 2.

[3]SCWA. Management Plan, IV-1.

Graph 1-I-1
ANNUAL RUSSIAN RIVER PLOW AT HACIENDA GAUGE
1940 - 1994, IN ACRE-FEET



To analyze the adequacy of surface water supplies, digital computer models are used. The Sonoma County Water Agency has developed a computer model of the Russian River system. The system consists of the Russian River, Lake Mendocino and Lake Sonoma. The model consists of two separate computer programs, one for the portion of the Russian River upstream from its confluence with Dry Creek, and one for the portion below the confluence.[4] A similar model has been developed by the Agency for Pacific Gas and Electric Company's Potter Valley Project on the South Fork Eel River which diverts water into the East Fork

[4]Sonoma County Water Agency. Russian River System Model - A Water Balance Computer Model of the Russian River System, 1996.

Russian River.[5] The daily diversions from the Eel River to the Russian River derived by this model are used as input to the model of the Russian River system. Both computer models simulate the daily operation of the respective river systems by superimposing the man-caused influences (dams, reservoir release criteria, and water supply demands) on a historic period of natural inflows to the river system. The historic period modeled is the 70 year period from October 1922 through September 1992.[6]

RUSSIAN RIVER SERVICE AREA

The Russian River service area is shown in Figure 1-I-1. It is the area which is dependent upon the Russian River for water supply. It includes the hydrologic basin of the Russian River and portions of the hydrologic basin of San Francisco Bay. The hydrologic basins of the Russian River which are dependent upon the river for water supply are as follows:[7]

Coyote subunit - This is the drainage basin of the East Fork Russian River. It includes Potter Valley.

West Fork or Forsythe subunit - This is the drainage basin of the Russian River upstream from the Russian River East Fork confluence. It includes Redwood Valley.

Upper Russian subunit - This is the drainage basin of the Russian River between the Russian River East Fork confluence to just north of Cloverdale. It includes the Ukiah and Hopland Valleys.

Middle Russian subunit - This is the drainage basin of the Russian River between the upper Russian basin and the Dry Creek confluence. It includes Cloverdale, Geyserville and Healdsburg.

Dry Creek subunit - This drainage basin includes the entire Dry Creek watershed.

Santa Rosa subunit - This drainage basin includes the drainage basin of the Russian River downstream from the Dry Creek confluence. The Russian River service area outside the Russian

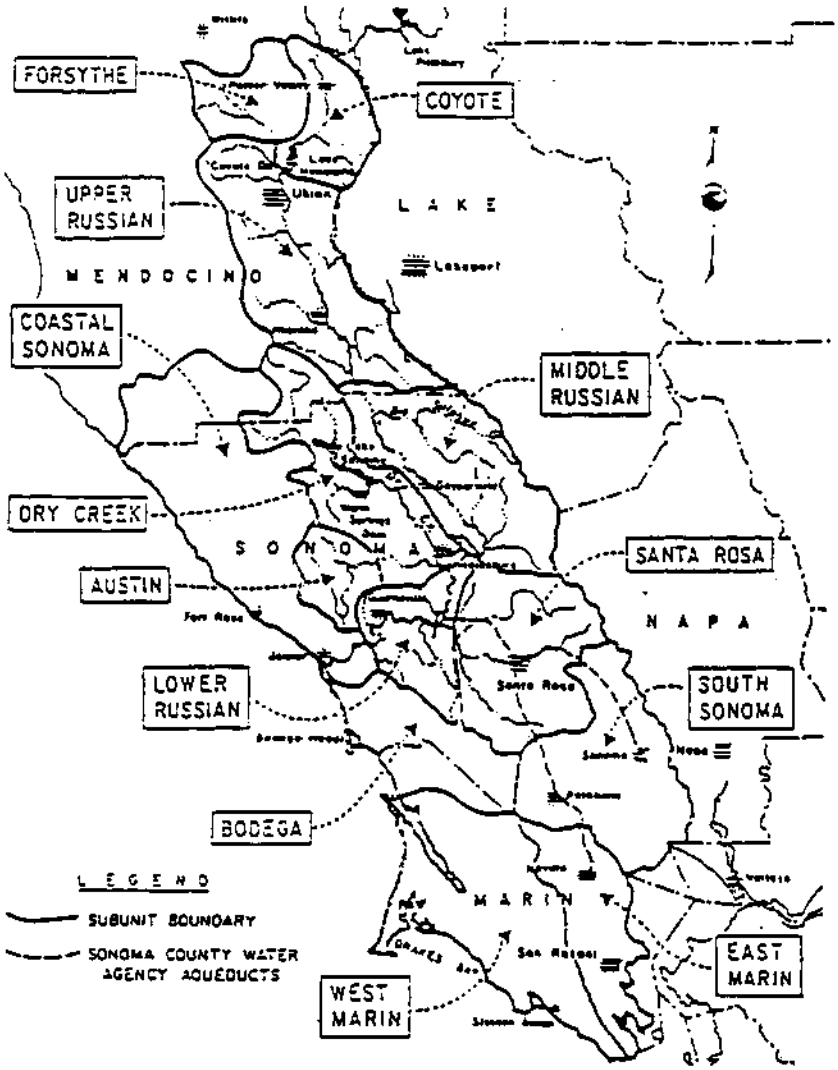
[5]Sonoma County Water Agency, Eel River/Potter Valley Project Model Development, 1988.

[6]SCWA. Management Plan, IV-1, 2.

[7]Ibid., IV-2.

River includes the Petaluma River basin, the Sonoma Creek basin and the urban portion of Marin County. The water from the Russian River which serves these areas is diverted within the Santa Rosa subunit.

Figure 1-I-1
RUSSIAN RIVER SERVICE AREA



WATER DEMANDS

Water demand estimates have been made for each of the above described hydrologic subunits. The estimates include demands which are diverted from tributaries of the Russian River as well as the main stem of the river. The season of availability of water for diversion from the tributaries is limited, since during the summer little or no flow is present. The agricultural and domestic water users along the tributaries typically construct storage facilities to store winter flows for later use.[8]

In general, the demands were estimated either by the Department of Water Resources (DWR) or by the Agency. Where the increase in future demands by one estimate was larger than the other, the larger estimate was used. The DWR demand estimates are based on land use and population projections developed by the State Department of Finance. These were originally published in 1980[9] and were revised during the 1986 State Water Resources Control Board (SWRCB) Decision 1610 hearings on the Agency's water rights applications. DWR demands are defined by agricultural and urban components for normal and dry years. DWR agricultural demand estimates are higher in dry years.[10]

In some cases the Agency used SWRCB water rights filings to estimate demands. The SWRCB water rights listings contain information on when, where, how much and for what purpose water can be diverted under each permit. For the purpose of estimating total demand, the most useful information contained in the listing is the maximum annual diversion. Most existing permits, however, do not contain annual limits. Depending on the information available for each permit, demands were generally calculated as follows:[11]

- If the application listed maximum annual diversion, this was taken to be the annual demand.
- For all filings which included storage (usually for irrigation, frost protection, heat protection or stock demands were estimated either by taking the maximum storage to be the annual demand, or by using the irrigated acreage and assuming that new crops would require

[8]Ibid., IV-2, 3.

[9]California Department of Water Resources, Water Action Plan For The Russian River Service Area, 1980.

[10]SCWA. Management Plan, IV-4.

[11]Ibid.

1½ feet per acre per year.

- In cases where two or more applications were filed under one name, with the same irrigated acreage at the same location, the demand was counted for only one of these applications.
- In several cases where neither the maximum annual diversion nor the irrigated acreage was listed, annual demand was assumed to be the listed diversion rate multiplied by the number of days in the listed diversion season.
- Where recreation was the only listed purpose and no maximum annual use was listed, it was assumed that there would be no consumptive water demand.

Several specific applications or groups of applications relating to one overall project were considered separately. Many of the these applications, when permitted, may be subject to terms which limit the amount of water diverted in combination with other permits. Specific information on combined limits is often contained in SWRCB notices of application to appropriate water. Where notices were available on pending applications, the combined limits were incorporated into the demand estimates.[12]

The digital model which was used to analyze the water supply condition of the Russian River relied upon demand estimates for the following seven relevant hydrologic subunits of the Russian River.[13]

- East Fork Russian River above Lake Mendocino (Coyote subunit)
- West Fork Russian River (West Fork or Forsythe subunit)
- Russian River from the Forks to Near Cloverdale (Upper Russian subunit)
- Russian River from Near Cloverdale to the Dry Creek confluence (Middle Russian subunit)
- Dry Creek above Warm Springs Dam (Upper Dry Creek subunit)
- o Dry Creek below Warm Springs Dam (Lower Dry Creek subunit)
- Russian River from the Dry Creek confluence to the Hacienda Bridge (Santa Rosa subunit)

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[12]Ibid., IV-4, 5.

[13]Ibid., IV-5.

Coyote Subunit - Coyote subunit demands were estimated by taking the difference between the estimated inflows to the subunit and the actual flow accretion or depletion. Normal demands were estimated using the difference between the estimated monthly average inflows and the observed flow accretions or depletions from 1980 to 1987. Dry and critically dry year demands were estimated using the same analysis for the critically dry water year 1977. Agricultural use in the Coyote subunit, which encompasses Potter Valley, is largely fully developed. Future demands in the Coyote subunit were increased by 70 acre-feet to account for the one currently pending appropriative water right application. Table 1-I-1 shows the expected year 2015 annual requirement:[14]

West Fork Subunit - The records of actual pumping by the Redwood Valley Water District from Lake Mendocino were assumed to represent the total current demands on the Russian River in the subunit. Future demands were projected using a straight-line extrapolation of the historical annual rate of growth in pumping by the District. The West Fork annual requirement in the year 2015 is expected to be 5,181 acre-feet.[15]

Table 1-I-1
Coyote Subunit Water Demand
in Year 2015

Water Supply Condition	Annual Requirement (acre-feet)
Normal Year	9,041
Dry Year	10,630

Upper Russian Subunit - Urban and agricultural demands for the year 2010, estimated by DWR, were assumed to be the year 2015 Upper Russian Subunit demands. Table 1-I-2 shows the expected year 2015 annual requirement:[16]

[14]Ibid.

[15]Ibid., IV-6.

[16]Ibid.

Table 1-I-2
Upper Russian Subunit Water Demand
in Year 2015

Water Supply Condition	Annual Requirement (acre-feet)
Normal Year	20,870
Dry Year	26,270

Middle Russian Subunit - For present agricultural demands, DWR estimates were used. For present urban demands, actual metered diversions for 1990-1991 were used. To estimate the total future Middle Russian Subunit demands, agricultural and urban demands were considered separately. Urban users in the subunit are the cities of Healdsburg and Cloverdale, and the Geyserville Water Company. The demand estimates for Healdsburg and Cloverdale were based on general plan population projections. The Geyserville Water Company estimate was based on current use.[17]

The City of Healdsburg currently diverts all of its water from the Russian River. However, it is currently preparing environmental documents for *a* system of wells on Dry Creek. Its total future demand, based on general plan population projections, is estimated at 4,440 acre-feet per year. At present it is uncertain how its future diversions would be split between its Russian River and Dry Creek sources. For the purposes of the analysis, it was assumed that Healdsburg would divert 2,150 acre-feet from the Russian River. It was assumed the remainder would be diverted from Dry Creek.[18]

Future demands estimated from pending water rights applications total 8,311 acre-feet. The increase in demand estimated from pending applications was added to the 1990 DWR agricultural demand and cities estimate. The combined Huntington Beach Company application demands were assumed to be 1,500 acre-feet per year. The demands represented by the pending applications in the Middle Russian subunit submitted by the Northern California Power Agency (NCPA) and the Unocal Geothermal Corporation were also considered separately because of their relatively large size. The purpose of both projects is use the diverted water for deep well injection to replenish declining steam production at geothermal wells. For the purposes of

[17]Ibid.

[18]Ibid., IV-7.

modeling future demands, it was assumed that the NCPA and Unocal projects would divert 2,411 and 3,500 acre-feet per year, respectively. Other pending applications were assumed to represent a future demand of 900 acre-feet per year. Since the largest portion of all of these applications (NCPA, Unocal and Huntington Beach Company) would only divert water during the winter, it was assumed that the total 8,311 increase represented by pending appropriative water rights applications would be diverted from November to May. Table 1-I-3 summarizes the expected year 2015 annual requirement.[19]

Upper Dry Creek Subunit - State Water Resources Control Board (SWRCB) water rights records for the Upper Dry Creek subunit list only three small diverters in this subunit, therefore there are assumed to be no significant present or future agricultural or urban demands in this subunit.[20]

Table 1-I-3
Middle Russian Subunit Water Demand
in Year 2015

	Annual Requirement (acre-feet)	
Water Supply Condition	Normal	Dry
User		
Agriculture		
Present	8,190	11,190
Huntington Beach	1,500	1,500
Other Pending Applications	900	900
Urban		
Healdsburg	2,150	2,150
Cloverdale	3,950	3,950
Geyserville	200	200
Geothermal		
NCPA	2,411	2,411
Unocal	3,500	3,500
Total	22,801	25,801

[19]Ibid., IV-7, 8.

[20]Ibid., IV-8.

Lower Dry Creek Subunit - Agricultural use comprises most of the present demands for the Lower Dry Creek subunit. The present demands were estimated as the average annual depletion in flow between Warm Springs Dam and the mouth of Dry Creek between 1983 and 1991, was approximately 3,500 acre-feet per year. To estimate the future urban demands in the Lower Dry Creek subunit, the future Healdsburg demand described above was used. Future agricultural demands were estimated by adding the 312 acre-feet of demand represented by currently pending water rights applications to the existing agricultural demand. Because the flow records indicate no discernable difference between normal and dry year depletions in Dry Creek, agricultural demands were not increased for dry years. Table 1-I-4 summarizes the expected year 2015 annual requirement.[21]

Table 1-I-4
Lower Dry Creek Subunit Water Demand
in Year 2015

User	Annual Requirement (acre-feet)
Agriculture	3,812
Healdsburg	2,290
Total	6,102

Santa Rosa Subunit - Although there is certainly significant agricultural development in this subunit, DWR estimates include no agricultural demands. Present and future agricultural demands were estimated separately by the Agency for users that divert from the main-stem Russian River and for users that divert from the tributaries.[22]

For the mainstem Russian River, the total cultivated acreage adjacent to the river channel between Dry Creek and the U.S.G.S gauge at the Hacienda Bridge was measured from the Agency's recent Russian River aerial photographs. Nearly all of this

[21]Ibid.

[22]Ibid., IV-9, 10.

2,210 acres is planted with vineyards. Water use was assumed to be 1.0 and 1.5 acre-feet/acre/year in normal and dry years respectively. Future demands were calculated by adding the 225 acre-feet of demand estimated from pending water rights applications to the existing use.[23]

The present demand on the tributaries in the Santa Rosa subunit were estimated at 660 acre-feet from the approximately 210 existing approved water rights permits, licenses and riparian use statements listed in SWRCB records. The total present demand was estimated at 5,350 acre-feet per year. The SWRCB records show that the largest part of these filings are from small storage projects with seasons of diversion limited to the winter months. For the purposes of modeling, it was assumed that this demand was taken between the months of November and May.[24]

Urban demands comprise most of the demands in the Santa Rosa subunit. The Town of Windsor future demands were estimated at 4,725 acre-feet per year, based on the projected population in the 1984 Windsor Specific Plan. The Russian River Water District has estimated its future demands at 302 acre-feet per year, based on its present water use (no growth in demand was projected). The District has also applied to the SWRCB for water rights for this amount. The diversions made by Windsor and the Russian River Water District are not deemed to be Agency demands, since the diversions are not made by the Agency. The Agency does, however, have contracts with these diverters which permit their diversions to be made under the Agency's appropriative water rights under certain conditions.[25]

The balance of the urban demand in the lower Russian basin is the water diverted and delivered by the Agency to satisfy the combined needs of all of the contractors served from the water transmission system of the Agency. The estimated Agency demand in the Santa Rosa subunit is listed in Table 1-I-5.[26]

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[23]Ibid., IV-10.

[24]Ibid.

[25]Ibid.

[26]Ibid., IV-10, 11.

Table 1-I-5
AGENCY SANTA ROSA SUBUNIT RUSSIAN RIVER WATER DEMAND IN YEAR 2015

Public Water System	Annual Requirement (acre-feet)
Santa Rosa	29,100
North Marin WD	14,100
Petaluma	13,400
Rohnert Park	7,500
Valley of the Moon WD	3,200
Sonoma	3,000
Cotati	1,520
Forestville WD	480
Other Agency Customers	2,500
	74,800
Marin Municipal WD	14,300
Total	89,100

Table 1-I-6 summarizes the total expected year 2015 annual water demand for the Santa Rosa subunit.27

[27]Ibid., IV-12.

Table 1-I-6
Santa Rosa Subunit Water Demand
in Year 2015

Water Supply Condition	Annual Requirement (acre-feet) Normal	Dry
User		
Agriculture	8,445	9,545
Urban (1)		
Windsor	4,725	4,725
Russian River WD	302	302
Sonoma County Water Agency	89,100	89,100
Total	102,572	103,672

(1) Total Santa Rosa subunit 2015 urban use is estimated to be 94,127 acre-feet.

CURTAILMENT CRITERIA

With the extreme variability in the climate, the construction and maintenance of dams and reservoirs with the capacity to satisfy 100 percent of the demand during climatic conditions which occur only very rarely, is not feasible. Planning assumptions vary from agency to agency, but a 15 percent deficiency is generally considered to be manageable, provided it only occurs infrequently. While no curtailment criteria have been formally adopted by the Agency, it has been assumed that in the future a 15 percent deficiency would be taken beginning with the second dry month. In addition, one criterion has been externally imposed which has also been incorporated into the Agency's water supply models. Decision 1610 of the State Water Resources Control Board ordered that a new term be added to the Agency's Warm Springs Dam appropriative water rights permit to read:[28]

[28]Ibid., IV-14.

"Permittee shall impose a mandatory thirty percent deficiency in deliveries from the Russian River to its service area whenever the quantity of water in storage at Lake Sonoma drops below 100,000 acre-feet before July 15 of any year. The deficiency shall remain in effect until (1) storage in Lake Sonoma rises to greater than 70,000 acre-feet subsequent to December 31 after having fallen below that level, or (2) permittee has projected, to the satisfaction of the Chief, Division of Water Rights, that storage at Lake Sonoma will not fall below 70,000 acre-feet, or (3) hydrologic conditions result in sufficient flow to satisfy permittee's demands at Wohler and Mirabel Park and minimum flow requirements in the Russian River at Guerneville."

STREAMFLOW MAINTENANCE

The minimum streamflows which must be maintained in the Russian River and Dry Creek to support recreation, fish and wildlife, and other instream beneficial uses are shown in Figure 1-I-2. They were established by Decision 1610 of the State Water Resources Control Board, adopted in 1986 after three weeks of public hearings.[29]

Minimum streamflow requirements also represent a water supply demand on the Russian River system. In a normal year the total quantity of water which must be allowed to pass under the Hacienda Bridge under these requirements is 80.8 mgd (125 cfs), which amounts to 90,495 acre-feet per year. In a dry year these quantities are reduced to 54.9 mgd (75 cfs), or 61,537 acre-feet per year. In a critically dry year these quantities are further reduced to 22.6 mgd (25 cfs), or 25,340 acre-feet per year.[30]

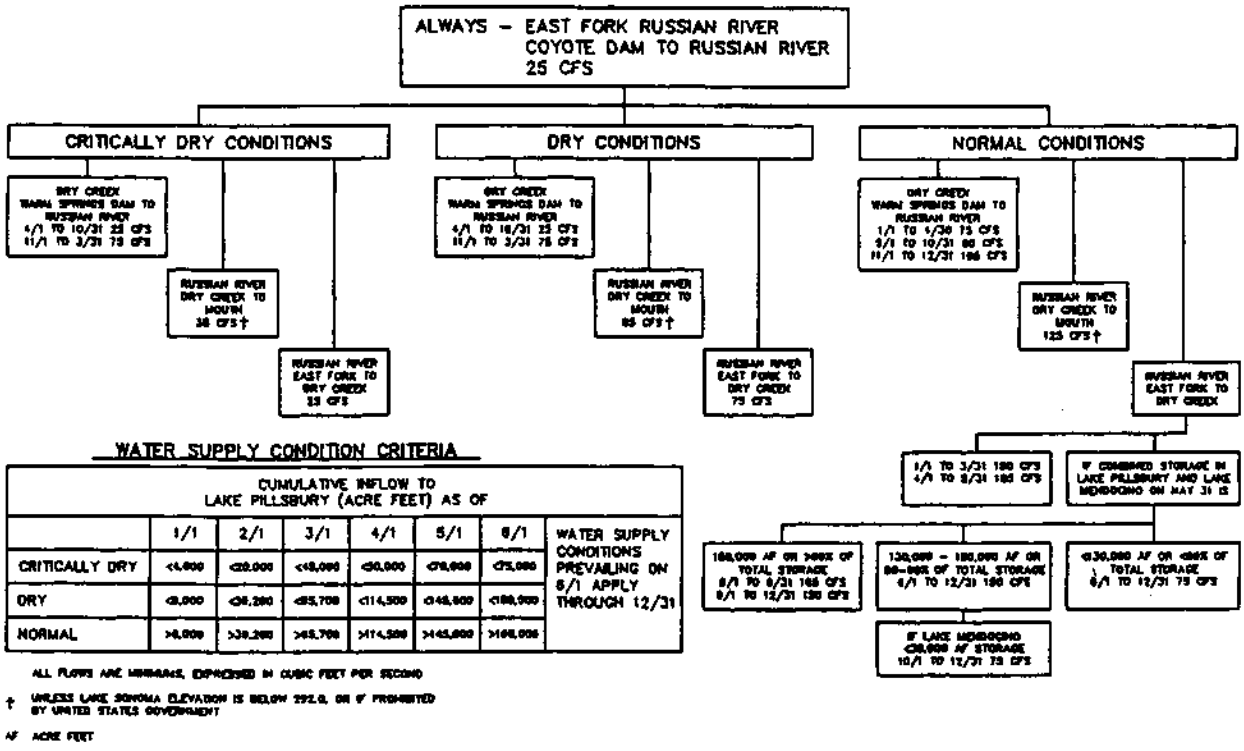
These are of course minimum flows. The actual flows maintained are much greater, even in a critically dry year, for both operational reasons and because of the unregulated runoff from the large portion of the Russian River watershed which is downstream of Warm Springs Dam and Coyote Valley Dam. In fact, under the estimated year 2015 demand condition, in an average year over 90 percent of the natural flow will still flow past the Hacienda Bridge. That is more than 1,500,000 acre-feet, or nine times the combined amount which will be consumed for agricultural and urban use. Graph 1-I-2 shows the average year allocation of

[29]Ibid., IV-15.

[30]Ibid., 16.

water between year 2015 agriculture and urban demands and streamflow.[31]

Figure 1-I-2 RUSSIAN RIVER MINIMUM STREAMFLOWS



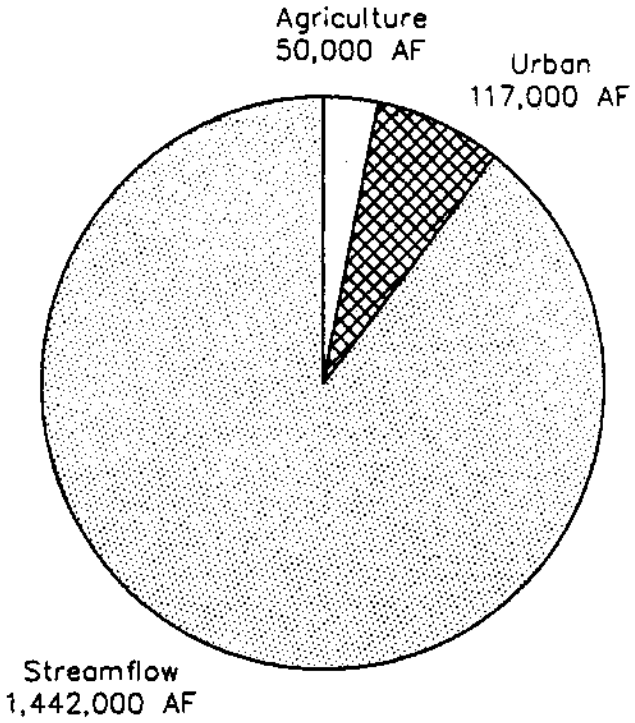
During the summer months streamflows are maintained at artificially high levels with releases from storage. These flows are significantly greater than the flows that occurred before the influence of civilization, even at the reduced rates of flow which are permitted during "dry" and "critically dry" conditions. Historically, in normal years late summer flows in the lower Russian River dropped below 30 cubic feet per second, and in dry years, dropped below 10 cubic feet per second.[32]

[31]Ibid.

[32]Ibid., IV-16, 17.

Graph 1-I-2

ALLOCATION OP RUSSIAN RIVER WATER IN A AVERAGE YEAR UNDER YEAR 2015 DEMAND CONDITIONS



MODEL STUDY RESULTS

Table 1-I-7 shows the frequency of occurrence of the mandatory 30 percent curtailments with a 15 percent deficiency in the second and subsequent dry and critical months. The maximum annual Santa Rosa subunit urban demand which can be satisfied under the these criteria without Lake Sonoma dropping below the minimum pool is approximately 112,000 acre-feet per year.[33]

[33]Ibid., IV-18.

Table 1-I-7
OCCURRENCE OF MANDATORY 30 PERCENT DIVERSION CURTAILMENTS WITH A 15 PERCENT DEFICIENCY DURING DRY MONTHS

Santa Rosa Subunit Russian River Urban Demand (acre-feet)	Months of 30% Curtailment 1922-1992				
	1977	1924	1933	1934	1935
60,000 (1)	0	0	0	0	0
70,000	0	0	0	0	0
80,000	0	0	0	0	0
90,000	6	0	0	0	0
100,000	8	1	0	0	0
105,000	9	1	0	0	0
110,000	10	1	3	2	0
112,000 (2)	10	1	4	3	1

(1) Approximate 1995 Santa Rosa subunit River urban use.

(2) Maximum Santa Rosa subunit urban water supply available.

The model study results demonstrate that the Russian River water supply is adequate to satisfy all identified water demands in Sonoma, Mendocino and Marin County which are likely to be placed on the main stem in the foreseeable future. The total identified Santa Rosa subunit 2015 urban demand, which includes all Agency diversions from the Russian River, is approximately 94,000 acre-feet per year. After satisfying all other identified water demands on the Russian River, this demand can be satisfied with an expectation of rarely (one or two years out of 70) having the mandatory 30 percent curtailment triggered. Under the 30 percent curtailment criteria, which is mandated by the Agency's water rights permit terms under certain reservoir conditions, and a voluntary 15 percent curtailment beginning in the second dry month, the maximum annual Santa Rosa subunit urban demand which can be satisfied without Lake Sonoma dropping below the minimum pool is approximately 112,000 acre-feet per year. Thus, 18,000 acre-feet per year of water supply is available from the Russian River to satisfy currently unidentified future needs in Sonoma and Marin Counties. The use of this remaining supply, however, would result in the mandatory curtailment criteria being triggered more frequently. If this supply were used, the construction of additional emergency off-stream water production facilities to reduce the impact on water consumers of the 30 percent curtailment in Russian River diversions might be necessary.[34]

34Ibid., IV-22.

Chapter II, Water Quality

INTRODUCTION

The North Coast Regional Water Quality Control Board of the State of California, as well as several other agencies, have monitored the water quality of the Russian River since the early 1970's. Water quality parameters monitored by the Regional Board include nutrients, bacteria, physico-chemicals and toxic chemicals. From 1973 through 1978 the monitoring effort was quite intensive. The effort was scaled down significantly between 1979 and 1985. In September of 1985, intensive monitoring of water quality in the Russian River was reestablished and continued through June 1991. From July 1991 through 1995 routine monitoring was again reduced.[35]

The Russian River has a persistent winter and early spring turbidness. To determine the source of the turbidity and the rate of sediment transport in the Russian River, in February 1964 the U.S. Geological Survey (USGS) established a network of sediment sampling stations along the river, on some of its tributaries, and near Lake Pillsbury on the Eel River. In 1971 the USGS published a report on turbidity and suspended-sediment transport in the Russian River based upon data collected through 1968.[36] Some subsequent sediment data has been collected at these sampling stations. At USGS's Russian River near Ukiah sampling station, sediment data exists for water years 1964-1968, 1991 and 1992. At USGS's East Fork Russian River near Ukiah sampling station, sediment data exists for water years 1953-1955 and 1964-1968. At USGS's Russian River near Hopland sampling station, sediment data exists for water years 1990-1993. At USGS's Russian River near Guerneville sampling station, sediment data exists for water years water years 1967 and 1970-1986.[37]

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[35]North Coast Regional Water Quality Control Board, Draft Staff Report regarding Russian River Water Quality Monitoring, by Cathleen A. Goodwin, March 1996, 1-2.

[36]United States Geological Survey. Turbidity and Suspended-Sediment Transport in the Russian River Basin. California, by John R. Ritter and William M. Brown III, October 1971, 1.

[37]United States Geological Survey, Water Resources Data California Water Year 1993. Volume 2, by J. R. Palmer, M. F. Friebel, L. F. Trujillo and K. L. Markham, 1994, 226-260.

NUTRIENTS

Nitrate and phosphate are readily used by algae and vascular plants as nutrients. High concentrations of nitrate and phosphate can cause nuisance algae blooms and excessive aquatic plant growth, leading to low concentrations of dissolved oxygen during night hours when the algae and plants respire. This low dissolved oxygen can result in adverse impacts on aquatic life. Additionally, swings in pH occur as the plants photosynthesize in the daytime and respire at night.[38]

The North Coast Regional Water Quality Control Board's (NCRWQCB) Water Quality Control Plan contains a narrative objective for nutrients. That objective is that waters shall not contain nutrients in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.[39]

Concentrations of total nitrate and total phosphate are currently low in the mainstem of the Russian River. This has not always been the case. Both nitrate and phosphate concentrations in the Russian River have decreased significantly since the early 1970's. This reduction is indicative of the effectiveness of increased levels of pollution control efforts which was initiated in the late 1960's.[40]

Nitrate concentrations have declined in the mainstem of the Russian River since 1973, as shown in Graph 1-II-1. The median values for 1973, 1975 and 1976 are based on summer monitoring data, while the median values for 1986 and 1992 are based on year-round data. The numbers are nevertheless comparable since summer discharges from municipal treatment plants were occurring in the 1970's and much of the more recent data was collected during the winter discharge season when nutrient concentrations tend to be higher.[41] Another analysis of the nitrate concentration trend in the mainstem Russian River which included only dry season data, and included additional data collected from 1993 through 1995, confirms that nitrate concentrations have

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[38]North Coast Regional Water Quality Control Board. Interim Staff Report regarding Russian River Water Quality Monitoring, January 1993, 9.

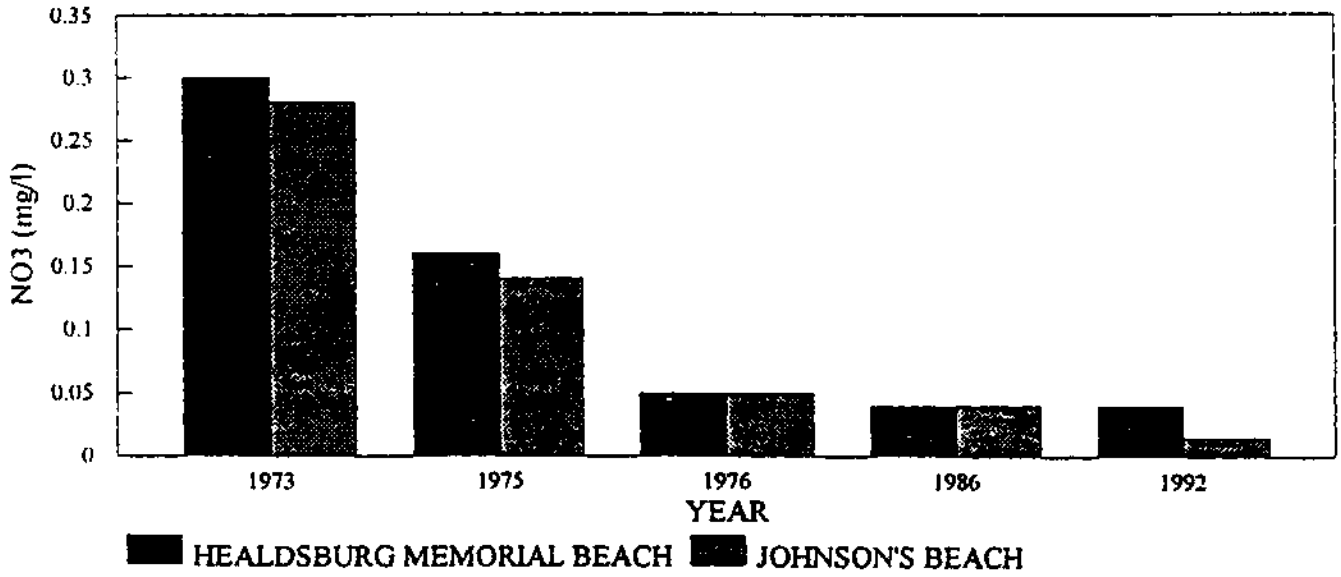
[39]North Coast Regional Water Quality Control Board, Water Quality Control Plan, North Coast Region, December 1993, 3-3.00.

[40]NCRWQCB, Interim Staff Report, 10.

[41]Ibid., 10, 11.

declined significantly since the early 1970's.[42]

Graph 1-II-1
MEDIAN NITRATE CONCENTRATIONS AT HEALDSBURG MEMORIAL BEACH AND JOHNSON'S BEACH



Phosphate concentrations have also declined in the mainstem of the Russian River since 1973, as shown in Graph 1-II-2. The median values for 1973, 1975 and 1976 are based on summer monitoring data, while the median values for 1986 and 1992 are based on year-round data. As in the case for nitrates, the numbers are comparable since summer discharges from municipal treatment plants were occurring in the 1970's and much of the more recent data was collected during the winter discharge season when nutrient concentrations tend to be higher.[43] Another analysis of the phosphate concentration trend in the mainstem Russian River which included only dry season data, and included additional data collected from 1993 through 1995, confirms that phosphate concentrations have declined significantly since the early 1970's.[44]

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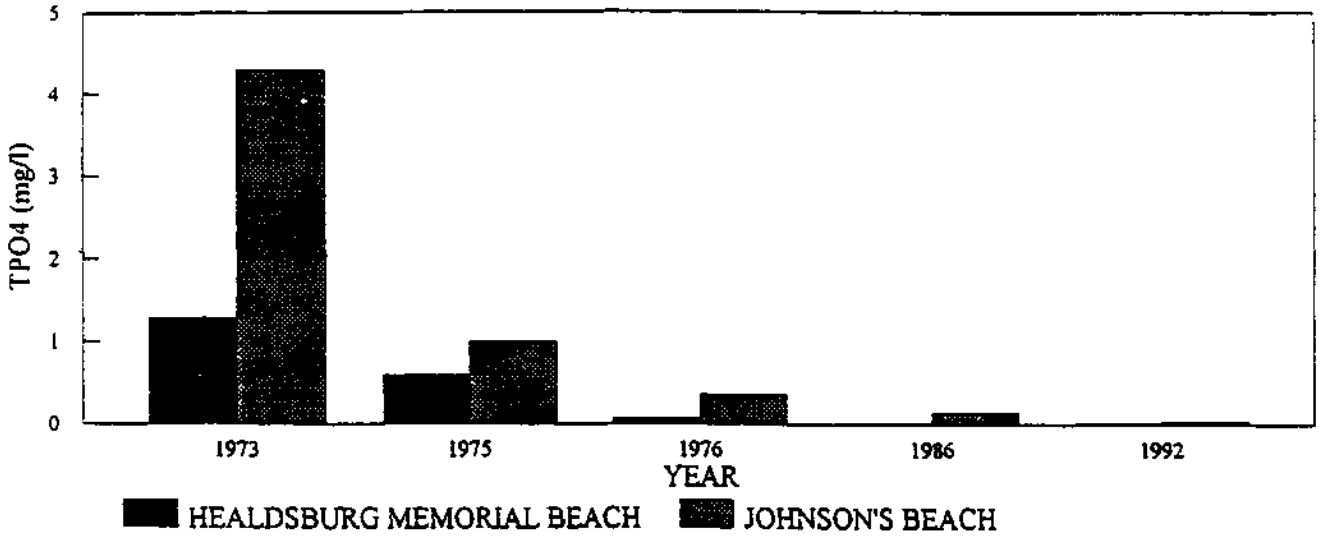
[42]NCRWQCB, Draft Staff Report, 13.

[43]NCRWQCB, Interim Staff Report, 12.

[44]NCRWQCB, Draft Staff Report, 14.

Graph 1-II-2
MEDIAN PHOSPHATE CONCENTRATIONS AT HEALDSBURG MEMORIAL BEACH AND JOHNSON'S BEACH



BACTERIA

The health significance of bacteria levels in surface waters is primarily related to water contact recreational use. Both public and private water supply system standards for surface water sources assume the presence of pathogenic organisms and provide for their removal and/or disinfection. The Statewide Conference of Directors of Environmental Health developed fecal coliform standards for freshwater recreation in 1973. The standards describe recommended and action levels of 50/100 ml and 200/100 ml respectively. The recommendations call for investigations to commence into the causes when the recommended level is reached, and the application of public warnings or restrictions when the action level is exceeded. Federal criteria for full body contact prior to 1986 called for a log mean[45] of not less than five samples over a 30-day period not to exceed a fecal coliform concentration of 200/100 ml, and not more than 10% of total samples over a 30-day period to exceed 400/100 ml. The

[45]"Log mean" refers to a method of summarizing, with a single value, several sample test values. It reduces the impact of sample test value variability on the single value below what it would be if the arithmetic mean were used.

U.S. Environmental Protection Agency developed new criteria in 1986 which called for measurements of E. coli and enterococci rather than fecal coliform bacteria, based on findings nationwide of better correlation to swimming-associated gasteroenteritis at both marine and freshwater bathing beaches. The State, however, has not adopted the new criteria.[46]

The NCRWQCB's Water Quality Control Plan contains a numerical objective for bacteria. That objective is that in waters designated for contact recreation the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml.[47]

Bacteriological monitoring of the Russian River has been conducted since the early 1970's. Prior to and including 1976, fecal coliform levels in the Russian River from Alexander Valley to Duncan Mills consistently exceeded the NCRWQCB's water quality objective for body contact recreation.[48] Since 1985, spot checks for background levels of fecal coliform from Talmage in Mendocino County to the Casini Ranch near the mouth of the Russian River indicate compliance with the NCRWQCB's water quality objective in areas which do not receive heavy recreational use or which are not influenced by summer dams. The 50/100 ml level of fecal coliform concentration was exceeded at times in high-use swimming areas with summer dams such as Healdsburg Memorial Beach, Johnson's Beach and Monte Rio Beach. However, an assessment of the monitoring results, based upon guidance provided by the State Department of Health Services, has indicated that no public warnings or restrictions are warranted.[49]

In addition to the fecal coliform introduced into the Russian River by recreational users, increased levels can and do result from malfunctioning individual Wastewater disposal systems. Responsibility for the abatement of failed systems rests with the Sonoma County and Mendocino County health departments.[50] The largest unsewered areas having known problems with on-site Wastewater disposal systems in the Russian River

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[46]North Coast Regional Water Quality Control Board, Interoffice Communication, by Theresa Wistrom, December 1994, 2.

[47]NCRWQCB. Water Quality Control Plan, 3-3.00.

[48]NCRWQCB. Interim Staff Report, 13.

[49]NCRWQCB. Interoffice Communication, 2.

[50]NCRWQCB. Interim Staff Report, 14.

basin are located along the lower Russian River in Sonoma County.

The Sonoma County Department of Health Services retained Questa Engineering Corporation to perform an investigation of the adequacy of individual septic systems in the Camp Meeker area in early 1989. Camp Meeker is a residential community of some 350 homes located about one mile north of the town of Occidental along the Bohemian Highway in Sonoma County. The area was developed in the early 1900's as a summer vacation area but in more recent years it has developed a permanent population. Many of the houses are located on small lots, in many cases no more than 4,000 to 5,000 square feet. All of the homes are served by individual septic systems which are typically very old, predating modern health codes.[51]

In the 1989 survey, covering 102 houses of the 350 developed parcels in Camp Meeker, 37% were observed to have surface failures. These were evidenced by saturated soils, standing water or seepage in or immediately adjacent to the leachfield area, or the presence of greywater systems discharging to the ground surface. An additional 23% were judged to have problems on the basis of observed excessive vegetative growth in the leachfield area and/or homeowner complaints of plumbing back-ups, odors or leachfield saturation during normal winter conditions. The properties having evident and suspected problems were distributed throughout the Camp Meeker area.[52]

Based upon the septic system survey and water quality sampling, Questa concluded that water quality degradation is occurring and a significant public health threat exists as a result of existing on-site sewage disposal practices in Camp Meeker. Questa Engineering further concluded that because of the inherently poor site conditions, numerous old systems and high density of development, neither an on-site septic system maintenance program or the development of neighborhood leachfields to serve small clusters of homes would solve the problem. They recommended that strong consideration be given to developing a community sewer system with either a separate community treatment facility, or a connection to nearby community treatment facilities.[53]

Early in 1989, the Sonoma County Department of Health

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[51]Sonoma County Public Health Department, Wastewater Pollution Study for the Community of Camp Meeker, by Questa Engineering Corporation, November 1989, 1-1.

[52]Ibid., 2-1.

[53]Ibid., 2-3.

Services also retained Oscar Larson & Associates to perform an investigation of the adequacy of individual septic systems in the Mirabel Heights area. Mirabel Heights is a residential area with a few commercial establishments located near the confluence of Mark West Creek with the Russian River at the junction of River Road and Mirabel Road. The area includes 349 parcels of property, 240 of which are developed.[54]

That survey covered 133 of the 240 developed parcels in Maribel Heights and found that 40% of the septic systems were malfunctioning and an additional 29% were found to be marginal. Information provided by the Sonoma County Health Department and the North Coast Regional Water Quality Control Board to Oscar Larson & Associates, or from observations made during site inspections, identified an additional 80 parcels with malfunctioning or marginal disposal systems. Combining all information, an estimated 71% of the Mirabel Heights area residents Wastewater goes to malfunctioning or marginal septic systems.[55]

Based upon the survey and water quality sampling, Larson concluded severe degradation of surface water quality is resulting from malfunctioning and marginal on-site waste disposal systems in the Mirabel Heights area. Larson further concluded that system repairs are not possible within a majority of the area due to the extremely small parcel sizes and relatively steep terrain.[56]

The Monte Rio area encompasses approximately 880 acres and includes Northwood, Bohemian Grove, Monte Rio and Villa Grande. The area includes approximately 950 residential and commercial developed parcels utilizing on-site septic systems for Wastewater treatment and disposal. The majority of these systems were installed prior to the development of current septic system design standards. While pollution studies have not been done for any of the communities in this area, septic system problems in this area are believed to be similar to those in the Mirabel Heights and Camp Meeker areas. The Monte Rio area shares many physical constraints with these areas, and there is an extensive history of septic system complaints in the Monte Rio area. Based on these similarities, it is likely that there is a high failure rate of private septic systems and contamination of surface and

[54]Sonoma County Public Health Department, Onsite Wastewater System Pollution Study in the Mirabel Heights Area of Sonoma County, by Oscar Larson & Associates, June 1990, I-2.

[55]Ibid., V-1, 2.

[56]Ibid., v.

ground water in the Monte Rio area.[57]

The Odd Fellows Park, Hacienda, Summerhome Park, Hollydale and Rio Dell communities are located along a five-mile reach of the Russian River between the communities of Rio Nido and Mirabel Heights. These five communities are primarily residential and utilize on-site septic systems for Wastewater treatment and disposal. The majority of these septic systems were also installed prior to the development of current septic system design standards.[58]

A pollution study was performed for the community of Summerhome Park which was published in April of 1990. This study documented a 33% rate of septic system failures and concluded that a threat to public health" existed. The study indicated that physical constraints such as small parcel sizes, relatively steep topography, and inadequate setbacks from exposed road cuts cause septic system malfunctions and render the area poorly suited for on-site Wastewater systems.[59]

While pollution studies have not been done for the communities of Odd Fellows Park, Hacienda, Hollydale or Rio Dell, existing private septic systems and physical site constraints are similar to those of Summerhome Park. Based on these similarities, it is likely that there is a high failure rate of private septic systems and contamination of surface and ground water in these communities as well.[60]

DISSOLVED OXYGEN

Dissolved oxygen (DO) is a measure of the oxygen that is dissolved in water expressed in milligrams of oxygen per liter of water. Algae and aquatic plants produce oxygen in quantities exceeding their needs during the day and respire at night and in the early morning hours, using dissolved oxygen. If the amount of respiration from algae and aquatic life is high, it, in combination with DO demand from decomposition and sediments, can result in low DO levels. Inadequate dissolved oxygen in surface

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[57]Sonoma County Water Agency. West County Sanitation Project, Staff Report for Workshop for the Board of Directors of the Russian River County Sanitation District, May 1996, 41.

[58]Ibid., 43.

[59]Ibid.

[60]Ibid.

waters produce adverse effects on fish and other aquatic life. In addition, the absence of dissolved oxygen results in the odoriferous products of anaerobic decomposition.[61]

The NCRWQCB's Water Quality Control Plan contains numerical water quality objectives for dissolved oxygen for various streams. For the Russian River, the objective for dissolved oxygen is a minimum of 7.0 mg/l, a 90th percentile lower limit[62] of 7.5 mg/l and a 50th percentile lower limit[63] of 10.0 mg/l.[64]

For any temperature, there is a corresponding value for 100% saturation of dissolved oxygen. The NCRWQCB has conducted an evaluation of DO saturation values from observed median temperature values, observed in the Russian River. Based upon 4,670 observations, the evaluation concluded that temperatures are too high in the Russian River for a DO saturation of 100% to meet the 50 percentile lower limit of 10.0 mg/l. Based upon the 4,670 observations, the potential DO saturation of 100% was only 9.35 mg/l. While it is physically possible for dissolved oxygen levels to exceed 100% saturation during the diurnal period of production of oxygen by algae and aquatic plants, the usefulness and practicality of a 50 percentile (median) lower limit objective which requires supersaturation to be achievable is suspect and is under review by the NCRWQCB.[65]

Dissolved oxygen observations have been made on the Russian River since 1973, however, these observations were normally made in the daytime. There does exist a total of 1,297 round-the-clock observations of DO which were made in 1991, 1994 and 1995. Of these observations, 97.1% met the minimum objective of 7.0 mg/l of DO and 80.6% met the 90th percentile objective of 7.5 mg/l. Predictably, only 0.5% of the observations met the 50th percentile objective. While the dissolved oxygen water quality objective of the NCRWQCB has not been fully attained in the mainstem of the Russian River, neither the reasons nor the significance with respect to the protection of aquatic life is well understood. The Regional Board is currently reevaluating the dissolved oxygen water quality objective.[66]

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[61]NCRWQCB. Draft Staff Report, 16.

[62]Ninety percent or more of the values must exceed 7.5 mg/l.

[63]Fifty percent or more of the values must exceed 10.0 mg/l.

[64]NCRWQCB, Water Quality Control Plan, 3-3.00.

[65]NCRWQCB. Draft Staff Report, 17, 18.

[66]Ibid., 17.

TOTAL DISSOLVED SOLIDS

Total dissolved solids (TDS) is a measure of the concentration of dissolved matter in water, expressed in milligrams per liter of water. It is influenced to the largest degree by groundwater inflow and Wastewater discharges. In a natural stream, TDS tends to increase from upstream to downstream due to groundwater inflow and evaporation. TDS also tends to increase as runoff increases.[67]

The NCRWQCB's Water Quality Control Plan contains numerical water quality objectives for total dissolved solids for various streams. For the Russian River, upstream from the Laguna de Santa Rosa, the objective for total dissolved solids is a 90th percentile maximum limit of 170 mg/l and a 50th percentile (median) maximum limit of 150 mg/l. Downstream from the Laguna de Santa Rosa, the objective for total dissolved solids is a 90th percentile maximum limit of 200 mg/l and a 50th percentile (median) maximum limit of 150 mg/l.[68]

In 1991, the University of California at Davis Water Quality Modeling group evaluated total dissolved solids in the Russian River using water quality data collected from 1985 through 1991. In the Russian River, upstream from the Laguna de Santa Rosa, the 90th percentile TDS based upon 301 observations was 200 mg/l and the median was 150 mg/l. Downstream from the Laguna de Santa Rosa, the 90th percentile TDS based upon 215 observations was 200 mg/l and the median was 150 mg/l. The median total dissolved solids water quality objective is met in both the upstream and downstream reaches. The 90th percentile water quality objective is met in the downstream reach but not in the upstream reach.[69]

The California Department of Health Services drinking water maximum standard for total dissolved solids is a recommended 500 mg/l, with upper and short-term limits of 1,000 mg/l and 1,500 mg/l respectively.[70]

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[67]NCRWQCB. Interim Staff Report, 15.

[68]NCRWQCB. Water Quality Control Plan, 3-3.00.

[69]NCRWQCB. Interim Staff Report, 15.

[70]California Code of Regulations, Title 22, Section 64449.

HYDROGEN ION CONCENTRATION

Hydrogen ion concentration (pH) is a measure of the acidity or alkalinity of water. The pH of *a* highly dilute solution, such as natural bodies of water, is approximately the same as the negative common logarithm of the hydrogen ion concentration. Natural waters usually have pH values in the range of 4 to 9 with seven being neutral, 4 being acidic, and 9 being basic. Most natural waters are slightly basic due to the presence of bicarbonates and carbonates of the alkali and alkaline earth metals.[71]

The NCRWQCB's Water Quality Control Plan contains numerical water quality objectives for pH for various streams. For the Russian River, the maximum limit is 8.5 and the minimum limit is 6.5.[72]

In 1991, the University of California at Davis Water Quality Modeling group evaluated pH in the Russian River using water quality data collected from 1985 through 1991. In the Russian River upstream from the Laguna de Santa Rosa, based upon 367 observations, 96.5% met the maximum pH objective and all observations met the minimum pH objective. Downstream from the Laguna de Santa Rosa, based upon 286 observations, 97.9% met the maximum pH objective and all observations met the minimum pH objective.[73]

TOXIC CHEMICALS

The State Water Resources Control Board adopted an Inland Surface Waters Plan (ISWP) which contained water quality objectives for an extensive list of noncarcinogenic and carcinogenic toxic chemicals, including heavy metals. The objectives take into consideration toxicity, carcinogenicity, and bioaccumulation factors. Although that plan was subsequently rescinded by the State Board as the result of a lawsuit, to the extent these objectives are being met in surface waters, aquatic

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[71]Lenore S. Clesceri, Arnold E. Greenberg and R. Rhodes Trussell, eds., Standard Methods for the Examination of Water and Wastewater, 17th Edition. (Washington, D.C.: American Public Health Association), 1989, 4-94.

[72]NCRWQCB. Water Quality Control Plan. 3-3.00.

[73]NCRWQCB. Interim Staff Report. 16.

organisms and human health should be protected.[74]

During the spring of 1992 the NCRWQCB sampled nine locations along the mainstem of the Russian River and its major tributaries and conducted a scan for the ISWP constituents. The results indicated compliance with the water quality objectives set forth in the ISWP and were below the level of laboratory detection in most cases. Since the laboratory detection limit for many constituents is higher than the ISWP objectives, these results are not conclusive. However, the NCRWQCB has also utilized other sampling and analysis methods which would indicate if the ISWP constituents were present.[75]

The State Mussel Watch Program and the Toxic Substances Monitoring. Program are two statewide programs which utilize animal tissue analysis to detect toxic substances which may be otherwise below detection limits. Under these programs toxic substances which bioconcentrate or bioaccumulate are detected through the analysis of resident or transplanted aquatic organisms. The Russian River has been included in sampling efforts under the State Mussel Watch Program since 1984 and under the Toxic Substances Monitoring Program since 1978.[76]

The results of the tissue analyses were highly variable, but in general, toxic substances have been found to be either low or below the detections limits of the applicable analytical method. With respect to mercury, however, several samples over a period of several years yielded analytical results of concern. While the U.S. Food and Drug Administration action level of 0.1 mg/kg was never exceeded, mercury values in excess of 0.05 mg/kg were not uncommon, particularly in tissue from Lakes Mendocino, Sonoma and Pillsbury and in tributaries not heavily impacted by urban runoff or Wastewater discharges. These data suggest a natural source of mercury, which may pose a threat to human health or wildlife.[77]

ENDOCRINE DISRUPTORS

A book was recently released under heavy publicity which describes threats synthetic chemicals pose to human and animal

[74]Ibid., 17.

[75]Ibid.

[76]Ibid., 18.

[77]Ibid.

fertility. The book has the personal endorsement from Vice President Al Gore and received extensive press coverage.[78]

The book, *Our Stolen Future*[79], states that a wide range of reproductive-related ills may be caused by chemical pollutants in the environment, including DDT, some forms of dioxins and PCB's, and a number of other synthetic substances. The idea is that exposure to even traces of these chemicals in the womb can interfere with proper development of the reproductive system, leading to serious consequences years or decades later.

Chemical manufacturers dismiss these speculations, arguing that no one has come close to showing a cause and effect relationship. Scientists on both sides of the debate acknowledge the need for additional research.[81] The position of the American Water Works Association is that additional research is needed and that not enough is known about the science of the issue to take any position.[82]

TURBIDITY

Turbidity commonly is a problem only when it becomes excessive. Sport fishing conditions are usually poor during periods of high turbidity. Besides its effects on sport fishing and the esthetics of a stream, turbidity excludes sunlight and restricts the growth of both planktonic and benthic algae, which are important to the food chain in a stream.[83]

The NCRWQCB's Water Quality Control Plan contains a narrative objective for sediment and a numerical objective for turbidity. The objective for sediment is that the suspended sediment load and suspended sediment discharge rate of surface

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[78]American Water Works Association. Public Affairs Advisory, March 15, 1996.

[79]J.P. Myers, Dianne Dumanoski and Theo Colborn, Our Stolen Future: How We Are Threatening Our Fertility. Intelligence, and Survival — A Scientific Detective Story (Dutton, 1996).

[80]Michael D. Lemonick, "What's Wrong With Our Sperm?" Time. March 18, 1996, 78.

[81]Ibid., 79.

[82]AWWA. Public Affairs Advisory.

[83]USGS. Turbidity and Suspended-Sediment Transport, 3.

waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. The objective for turbidity is that it shall not be increased more than 20% above naturally occurring background levels beyond an established dilution zone.[84]

Turbidity, like suspended-sediment discharge in a stream, can usually be correlated with water discharge. In general, turbidity increases as water discharge increases in streams with unregulated flows. In the Russian River, however, with its regulated flows, periods of turbid water more closely correlate with precipitation than streamflow.[85]

The most persistently turbid water in the Russian River is the water diverted from the Eel River into the East Fork Russian River. During the first large rainstorms of the winter, the water flowing into Lake Pillsbury becomes highly turbid. That water typically remains turbid for several months during the winter and early spring. Releases and diversion of that water through the Potter Valley Project into the East Fork Russian River cause the water flowing into Lake Mendocino to be more turbid than the reservoir water. Because with its high turbidity it is denser, the inflowing water moves along the bottom of Lake Mendocino. This highly turbid water reaches the Coyote Valley Dam outlet in about three days and then is released from Lake Mendocino. While the Russian River generally becomes turbid during rainstorms and clears afterwards, if large releases of turbid water from Lake Mendocino are made, the Russian River downstream remains turbid for extended periods.[86]

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[84]NCRWQCB. Water Quality Control Plan. 3-3.00.

[85]USGS, Turbidity and Suspended-Sediment Transport, 40.

[86]Ibid., 95.

Chapter III, Recreation and Public Access

INTRODUCTION

The Russian River has served as a vacation and recreation area for residents of the San Francisco Bay area and northern California for over 100 years. People came initially by stage coach and later by railroad. Upon completion of construction of the Golden Gate Bridge, automobile access from San Francisco caused an increase in the activity and the number of people visiting the Russian River. The subsequent rapid growth in the population of the San Francisco Bay and North Bay area caused additional increases in the demand for recreational opportunities.[87]

During this period three water resources development projects were constructed which greatly enhanced the recreation potential of the Russian River. These are the Potter Valley Project, the Coyote Valley Dam Project and the Warm Springs Dam Project. The initial features of the Potter Valley Project were completed in 1908. They consisted of the Cape Horn Diversion Dam on the Eel River, a tunnel and penstock which transferred water from the Eel River to the East Fork Russian River, and the Potter Valley Powerhouse. In 1921 the construction of Scott Dam on the Eel River was completed. The purpose of this feature was to provide water for diversion through the powerhouse during low flow periods. The construction of Coyote Valley Dam, forming Lake Mendocino, was completed in 1959. The construction of Warm Springs Dam, forming Lake Sonoma, was substantially completed in 1982.

In addition to providing extensive recreational facilities, which were developed in conjunction with the creation of Lakes Mendocino and Lake Sonoma, the operation of these projects had the effect of significantly enhancing the recreational potential of the Russian River by increasing the flows during the high use summer season. In Table 1-III-1, the average unimpaired flows in the Russian River during the period from 1923 through 1984 are compared with the current minimum flows which must be maintained by releases from Lake Mendocino and Lake Sonoma.[88] Unimpaired flows are those which would have occurred in the absence of dams

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[87]California State Coastal Conservancy. Russian River Public Access & Trespass Management Plan, Administrative Draft, 1995, by Hyden Associates Landscape Architects and Circuit Rider Productions Incorporated, 1.

[88]Sonoma County Water Agency, Urban Water Management Plan, 1991, 41.

and consumptive uses.

Table 1-III-1
COMPARISON OF THE NORMAL YEAR MINIMUM SUMMER STREAMFLOW WITH AVERAGE NORMAL YEAR UNIMPAIRED FLOWS IN THE RUSSIAN RIVER AT HACIENDA BRIDGE 1923-1984 IN CUBIC FEET PER SECOND

Minimum Flow[89]	125
Average Unimpaired Flow	
July	80
August	33
September	29

The flow rate of 125 cubic feet per second at Hacienda Bridge is the minimum rate of flow necessary in the Russian River to provide a satisfactory recreational canoeing experience. Lesser flows result in excessive portages being necessary. Canoe rentals from Ukiah to the mouth of the Russian River provide recreation for over 100,000 visitors annually.[90]

The economic benefit of recreation within the Russian River basin is substantial. The State Department of Tourism estimated 1993 total visitor spending at $599 million in Sonoma County and $259 million in Mendocino County. Of this $59 million and $31 million, respectively, was spent directly for recreation.[91]

RUSSIAN RIVER

From Ukiah to the county line there are no developed public access facilities and only one private recreation facility along the river. Some canoeing occurs in the lower part of this area

[89]Due to operational considerations, the actual flows are substantially greater than the required minimum flows.

[90]Coastal Conservancy, Russian River Management Plan, 2.

[91]Eel-Russian River Commission. Summary of Proceedings, Potter Valley Project Workshop, 1995, 129-131.

but this activity drops significantly north of Squaw Rock.[92]

From the county line to Healdsburg, canoeing is the primary recreational activity except in the Healdsburg area. Bridge crossings in this reach provide the primary access. There are no major public recreation facilities along this reach north of the Healdsburg area. Privately owned land along West Soda Rock Road is a major use area by the Hispanic population.[93]

The area from Jenner to Healdsburg is much more orientated to tourism and recreation. Along this reach there are substantial numbers of public and private recreational facilities and tourism is actively promoted. The proximity of this area to the ocean is an additional draw to tourists.[94]

The major use activities of the Russian River determined by a survey of users are; sunbathing and picnicking - 86% of respondents; swimming and floating - 84% of respondents; nature watching - 70% of respondents; and canoeing, kayaking and boating - 54% of respondents. Other significant activities include fishing from shore - 44% of respondents; camping - 36% of respondents; and partying - 38% of respondents.[95]

The seasonal distribution of Russian River use determined by a survey of users is; summer - 80% of respondents; spring - 32% of respondents; fall - 16% of respondents; and winter - 10% of respondents.[96]

The geographical distribution of Russian River use determined by a survey of users are; Ukiah to county line - 44% of respondents; county line to Healdsburg - 23% of respondents; and Healdsburg to Jenner - 45% of respondents. Less than 50% of the river users surveyed use developed beach facilities. Thirty-one percent (31%) of the respondents acknowledged crossing private property to gain access to the river.[97] Probably not coincidentally, 30% of the respondents thought river access is

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[92]Coastal Conservancy, Russian River Management Plan, 15.

[93]Ibid., 14.

[94]Ibid.

[95]Ibid., 10.

[96]Ibid.

[97]Ibid., 11.

inadequate.[98]

In addition to the lack of access, the major problems that river users surveyed identified are; water quality - 48% of respondents; litter - 46% of respondents; no trash cans - 43% of respondents; lack of restrooms - 40% of respondents; and inadequate parking - 34% of respondents.[99]

The draft Russian River Public Access & Trespass Management Plan of the California State Coastal Conservancy draws a number of conclusions regarding the adequacy of recreation and public access along the Russian River. These include the following:

- An additional large recreation site is needed between Jenner and Healdsburg, Steelhead Beach is identified as having the most potential.[100]
- Public access for canoe launching and landing is severely inadequate along the reach from the Mendocino-Sonoma County line to Healdsburg. Access sites are needed every six to nine river miles along this reach with minimum sanitation, toilet and parking facilities.[101]
- Recreation sites are needed at Comminsky Station Road south of Hopland and at Riverside Park (Gobbi Street) in Ukiah.[102]

LAKE MENDOCINO

Lake Mendocino is divided into the following six recreation areas:[103]

- Sho-da-kai. The island located near the dam is primitive and contains no recreational development. It is used primarily for fishing and day use.
- Chekaka. This area includes the park office, dam, Ukiah's

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[98]Ibid., 12.

[99]Ibid.

[100]Ibid., 20.

[101]Ibid., 15.

[102]Ibid., 21.

[103]ERRC, Proceedings, 135.

hydroelectric project, a steelhead trout egg taking and imprint facilities, a 24-unit campground, boat launching facilities, day use area and overlook.

- o Pomo - This is a day use area which contains four acres of turf, a visitors center, seven group picnic sites and a swimming beach.

- o Kyen. This area, located at the upper end of the lake, includes a 103 unit campground, marina, boat launching facilities, amphitheater and day use area.

- o Bushay. This area includes a 176 unit campground within which are three group use camp areas, an amphitheater and a day use area with two acres of turf.

- o Miti. This is a designated wildlife area. It contains no improvements except an 18 unit primitive campground accessible only by boat or by foot.

Visitation records have been kept for Lake Mendocino since 1964 when 550,000 recreation days were recorded. In 1993 visitation was 1,576,000 recreation days and in 1994 it was 1,468,600 recreation days. Visitation reached a peak of 2,761,400 recreation days in 1981 and has declined somewhat since, undoubtedly due in part to the availability of Lake Sonoma.[104]

Eighty-three percent (83%) of the recreation days at Lake Mendocino are day use and 17% by campers. The major use activities are; picnicking - 18%; boating - 22%; waterskiing - 13%; fishing from boat 4%; fishing from shore - 8%; swimming - 35%; hunting - 3%; and sightseeing - 29%.[105]

The seasonal distribution of Lake Mendocino use is; summer -45%; spring - 28%; fall - 16%; and winter - 11%.[106]

The percentage of visitors using the four principal recreation areas based upon a survey conducted from April through September was; Chekaka - 96% of respondents; Pomo - 91% of respondents; Kyen - 82% of respondents; and Bushay - 61% of respondents. The number of visitors originating from less than 25 miles away is 53%, while 26% originate from more than 100

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[104]Ibid., 136.

[105]Ibid., 139.

[106]Ibid., 138.

miles away.[107]

The Corps of Engineers has estimated the annual maximum practical use of Lake Mendocino at only 550,000 recreation days. This is the capacity of land and water to accommodate visitation considering expected use patterns and acceptable crowding. If 8 additional boat launch lanes and 314 additional campsites were developed, this capacity could be increased to 1,100,000 visitor days, which is considered the maximum potential of the resource. The current annual visitation of approximately 1,500,000 results in crowded conditions in parking lots, campgrounds and beaches during holidays and some weekends during the peak months.[108]

LAKE SONOMA

Lake Sonoma is divided into the following six principal recreation areas:[109]

- Warm Springs Dam Recreation Area. Located just downstream of Warm Springs Dam, this area occupies the largest piece of relatively flat land within the project boundaries. This day use area includes 12 acres of turf, individual and group picnic areas and parking. Adjacent attractions include Dry Creek, the Visitors Center and the Don Clausen Fish Hatchery.

- Project Overlook Area. Located off Stewarts Point Road, this area includes an access road and parking lot serving an arbor-covered viewing plaza and viewing tower. Restrooms serve the viewing visitors as well as the adjacent trailheads.

- Lake Sonoma Marina. This concessionaire-operated marina is located south of the overlook and is reached by an access road from Stewarts Point Road. The marina has individual and group picnic areas and restrooms and offers a boat launch ramp, boat slips, boat rentals, fueling station and a camp store.

- Public Boat Ramp. This area is located just west of the Warm Springs Bridge. It consists of a large parking area

[107]Ibid., 139.

[108]Ibid., 140-143.

[109]U.S. Army Corps of Engineers, Lake Sonoma CESPK BRO 360-1-32, 1992

and a multi-lane boat launch ramp.

o Liberty Glen Campground. This area, located south of Rockpile Road, contains restrooms, hot showers, trailer dump station, 113 individual campsites and two group camp areas for recreational vehicles and tent campers.

o Yorty Creek Recreation Area. This area is located at the end of Hot Springs Road about 5 miles southwest of Cloverdale. It consists of a car top boat launch facility, parking, a swimming beach, picnic area and toilets.

In addition the Lake Sonoma recreational facilities include 40 miles of developed hiking and equestrian trails and 115 boat-in primitive camp sites situated near the lake. There is also an 8,000 acre wildlife management area.[110]

Visitation records for years 1991 through 1993 show visitation remaining relatively constant at about 470,000 visitations per year. In 1991 the total number of visitors was 474,500; in 1992 there were 469,600 visitors; and in 1993 there were 461,300 visitors.[111]

Eighty-eight percent (88%) of the recreation days at Lake Sonoma are day use and 12% by campers. The major use activities are; picnicking - 19%; swimming - 24%; water skiing - 21%; boating - 45%; sightseeing - 24%; and fishing - 10%.[112]

The seasonal distribution of use of Lake Sonoma is; summer - 45%; spring - 28%; fall - 19%; and winter - 8%.[113]

The percentage of visitor hours at the various recreation areas in 1992 was; Warm Springs Dam Recreation Area - 5%; Project Overlook - 2%; Lake Sonoma Marina - 15%; Public Boat Ramp 31%; Liberty Glen Campground - 22%, Yorty Creek Recreation Area 6%, boat-in campsites - 15%; other, including equestrian and hiking trails - 3%.[114]

The Lake Sonoma Master Plan proposed the construction of a

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[110]U.S. Army Corps of Engineers, NRMS Image List, Project Number 04990. 1993, 1994 and 1995.

[111]Ibid.

[112]Ibid.

[113]Ibid.

[114]Ibid.

total of 506 campsites and 82 miles of trails and numerous other recreational features. With all of the proposed facilities, annual visitation carrying capacity of Lake Sonoma was projected to be 1,520,000. Only 45% of the campsites and about half of the trail mileage has been developed.[115] Many of the other proposed facilities also have not been constructed. The Corps of Engineers five-year plan does include the proposed development of the planned Cherry Creek and Hot Springs Road camp areas, which would add about 100 additional campsites.[116]

[115]U.S. Army Corps of Engineers, Lake Sonoma Master Plan, 1979, 150.

[116]Barbara Cooper, U.S. Army Corps of Engineers, personal communication on January 27, 1996.

Chapter IV, Gravel Mining

INTRODUCTION

A total of 51 million tons of aggregate was produced in Sonoma County during the ten year period 1981-1990. Of this amount, 16.9 million tons, or 34%, came from quarries; 24.2 million tons, or 47% came from terrace pits; and 9.9 million tons, or 19% percent came from instream operations. Projections of the need within Sonoma County for aggregate from 1991-2020 range from a low of 75 million tons to a high of 171 million tons.[117]

No equivalent figures for gravel mining in Mendocino County are available.[118]

RUSSIAN RIVER GEOMORPHOLOGY

The Russian River in Sonoma County can be divided into three discrete reaches, separated by geologic controls such as bedrock constrictions. These reaches are designated as the Alexander Valley reach, the middle reach and the lower reach. Upstream from Cloverdale, the Russian River is confined between Ward Mountain and Squaw Rock. The river valley widens between Cloverdale and Jimtown and forms the Alexander Valley reach before reaching another constriction around Fitch Mountain. The river valley widens again between Healdsburg and Wohler Bridge to form the middle reach. The stretch of river between Wohler Bridge and the ocean is the lower reach. The Russian River can be conceptualized as a series of cells, with most gravel resources located in the wider valleys. The river connecting these cells act primarily as conveyance channels with only limited gravel storage.[119]

The Russian River in Mendocino County consists of the two branches of the river upstream from the confluence of the East Fork Russian River and the Russian River (the forks) , and the two discrete reaches forming the Ukiah and Hopland valleys downstream from the forks. The East Fork Russian River forms Potter Valley

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[117]County of Sonoma, Sonoma County Aggregate Resources Management Plan and Environmental Impact Report, 1994, S-3.

[118]Dennis Slota, Mendocino County Water Agency, personal communication on February 29, 1996.

[119]Sonoma County, Management Plan and EIR, 4.3-1.

and the main stem upstream from the forks forms Redwood Valley. Ukiah Valley extends from river mile 96 to 84.5. The Hopland gorge constriction separates the two reaches and extends from river mile 84.5 to 79. The Hopland Valley extends from river mile 79 to 74. The Squaw Rock constriction extends from river mile 74 to 63 to the upstream end of Alexander Valley in Sonoma County.[120]

The first detailed channel survey of the Russian River in Sonoma County was undertaken by the U.S. Army Corps of Engineers in 1940. This survey extended from River Mile 0.0 at Jenner to River Mile 32.0 near Healdsburg. The Corps resurveyed the Russian River from River Mile 19.7 near Guerneville to River Mile 68.8 above Cloverdale in 1971. The Sonoma County Water Agency has annually surveyed 27 cross—sections along the Russian River from the State Highway 1 bridge near Jenner to the Old Preston Bridge near Cloverdale since 1983. Of these cross-sections, 23 were also surveyed between 1971 and 1983, and a few were surveyed prior to 1971. The Sonoma County Planning Department has conducted surveys of cross-sections in the middle reach since 1981.[121]

Longitudinal profiles of the river bed in the Alexander Valley indicate substantial channel degradation occurred at the upstream and downstream ends of this reach between 1971 and 1991. At river mile 62 in Cloverdale, at the upstream end of the Alexander Valley, the channel thalweg dropped at least eight feet between 1971 and 1982. However, a small amount of aggradation has occurred at this location since 1982. At river mile 57 near Asti, the river thalweg degraded approximately one foot between 1971 and 1991, however, long-term records (1959-1990) of the elevation of the river at a flow rate of 100 cfs indicate that the channel is neither aggrading nor degrading in this area. At river mile 52 at Geyserville, about seven feet of aggradation occurred between 1971 and 1982, and an additional three feet of aggradation occurred between 1982 and 1991. Between river mile 46 at Jimtown and river mile 51 a maximum measured degradation of 12 feet occurred between 1971 and 1982 at river mile 50. Smaller amounts of degradation occurred between river miles 50 and 51 during this period. However, between river miles 51 and 52, some aggradation took place from 1986 to 1991.[122]

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[120]Joan L. Florsheim and Peter Goodwin. Geomorphic and Hydrologic Conditions in the Russian River. California; Historic Trends and Existing Conditions. May, 1995, 5.

[121]Sonoma County. Management Plan and EIR, 4.3-2.

[122]Ibid., 4.3-13 through 4.3-16.

Longitudinal profiles of the river bed in the middle reach indicate substantial channel degradation occurred within this reach between 1940 and 1968, with up to 10 feet of degradation in some places. Between 1968 and 1991 there was an additional average lowering of 5 to 8 feet in the channel thalweg throughout the middle reach, with the greatest degradation occurring between the U.S. Highway 101 bridge and Dry Creek (in the vicinity of river mile 31). From river mile 27 to 29 there was about four feet of degradation between 1968 and 1972 with little change occurring between 1972 and 1991.[123]

Longitudinal profiles of the river bed in the lower reach indicate significant aggradation occurred within this reach between 1971 and 1989. Most of the channel change occurred at the upper end of the reach with about seven feet of aggradation occurring at river mile 19.8 and two feet occurring at river mile 19.2. Changes between river mile 16 at the Guerneville Bridge and river mile 6 were less pronounced, with aggradation and degradation of about one foot. At river mile 2 near the mouth of the Russian River, the channel aggraded about 4 feet between 1971 and 1976. At the State Highway 1 bridge, aggradation of two feet occurred between 1980 and 1989.[124]

Historic survey data in Mendocino County include a 1940 Corps of Engineers survey of the thalweg and a 1979 photogrammetric survey by the Federal Emergency Management Agency (FEMA). The FEMA survey show the summer flow water surface rather than the actual underwater channel configuration. A field survey of a short reach near Feliz Creek was conducted by Mendocino County in 1989.[125]

A comparison of a longitudinal profile surveyed by the Corps of Engineers in 1940 to a longitudinal profile derived from the FEMA photogrammetric survey shows that substantial degradation of the Russian River streambed has occurred in the Ukiah Valley reach of the Russian River. The profiles indicate channel degradation from Lake Mendocino Drive at about river mile 94 to about river mile 83.5. A minimum (the 1979 elevations are water surface) of about 10 feet of degradation occurred at Lake Mendocino Drive, up to about 18 feet at river mile 93, and up to 10 feet downstream of the Willow Rubble Dam at river mile 88.[126]

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[123]Ibid., 4.3-34.

[124]Ibid., 4.3-43.

[125]Florsheim and Goodwin, Geomorphic and Hydrologic Conditions, 12.

[126]Ibid.

A comparison of the longitudinal profile surveyed by the Corps of Engineers in 1940 to the longitudinal profile derived from the FEMA photogrammetric survey indicates that several feet of degradation of the Russian River streambed has also occurred in the Hopland Valley reach. Continuing degradation is indicated by a 1989 field survey performed in 1989 by Mendocino County between the Highway 101 bridge and Feliz Creek.[127]

U.S. Geological Survey stream gauge records show the water surface elevation at a 100 cfs flow rate declined by just over 3 feet at the gaging station near Hopland from 1956 to 1990. At the USGS Ukiah gaging station the 100 cfs water surface elevation dropped by 5.5 feet from 1952 to 1989.[128]

INSTREAM MINING

From 1981 through 1990 instream gravel removed from the Alexander Valley was 7,265 thousand tons. During the same period 1,641 thousand tons were removed from the middle reach for a total of 8,906 thousand tons, which represents an average removal rate of 891 thousand tons per year. From 1991 through 1995, instream gravel removed from the Alexander Valley was 2,479 thousand tons. During the same period no gravel was removed from the middle reach. The total of 2,479 thousand tons represents an average removal rate of 496 thousand tons per year.[129]

[127]Ibid.

[128]Mendocino County Water Agency, Graph of Water Surface Elevation for 100 cfs. USGS Stations with Old Ukiah Adjusted.

[129]Sonoma County. Russian River Instream Gravel Removal in Tons. 1981-1995, February 20. 1996.

Chapter V, Fishery

INTRODUCTION

Of the forty-eight fish species that exist or have existed in the Russian River, only the 19 species listed in Table 1l-V-l are native to the Russian River. The 29 fish species listed in Table 1-V-2 have been introduced. Most of the introduced fish were perceived to be valuable sports fish at the time of introduction, however, some were also species with predatory behavior. Introduction of non-native fishes began in 1872 with the first predator introductions in 1899. Predators introduced in the Russian River were largemouth bass, smallmouth bass, striped bass, channel catfish and green sunfish. The introduced predator species tend to occupy the lower river, effectively precluding use by salmonids. Table 1-V-3 lists numbers and dates of the exotic fishes planted in the Russian River for which actual records in the California Department of Fish and Game files have been found.[130]

Table 1-V-1
NATIVE FISH OF THE RUSSIAN RIVER

Common Name	Current Status
River Lamprey	Unknown
Western Brook Lamprey	Unknown
Pacific Lamprey	Common, Seasonal
Green Sturgeon	Rare
White Sturgeon	Rare
California Roach	Common
Hitch	Unknown
Hardhead	Common
Sacramento Squawfish	Common
Sacramento Sucker	Common
Pink Salmon	Probably Extinct
Coho Salmon	Rare, Seasonal
Steelhead Trout	Common, Seasonal
Chinook Salmon	Rare, Seasonal
Threespine Stickleback	Common
Coastrange Sculpin	Common
Prickly Sculpin	Common
Riffle Sculpin	Common
Russian River Tule Perch	Rare

[130]Steiner Environmental Consulting, History of Salmonid Decline in the Russian River, August 1996, 3.3-2 through 4.

Table 1-V-2
INTRODUCED FISH OF THE RUSSIAN RIVER

Common Name	Current Status
American Shad	Common, Seasonal
Goldfish	Common
Carp	Common
Sacramento Blackfish	Unknown
White Catfish	Unknown
Black Bullhead	Unknown
Brown Bullhead	Unknown
Channel Catfish	Unknown
Lake Whitefish	Probably Extinct
Cutthroat Trout	Probably Extinct
Atlantic Salmon	Probably Extinct
Brown Trout	Rare
Eastern Brook Trout	Probably Extinct
Lake Trout	Probably Extinct
Western Mosquitofish	Rare
Inland Silversides	Unknown
Striped Bass	Rare
Sacramento Perch	Unknown
Green Sunfish	Common
Bluegill	Common
Redear Sunfish	Unknown
Smallmouth Bass	Common
Largemouth Bass	Common
Splittail	Unknown
Fathead Minnow	Unknown
Golden Shiner	Unknown
White Crappie	Unknown
Black Crappie	Unknown
Yellow Perch	Probably Extinct

Lake Mendocino primarily supports warmwater fishes. Kokanee salmon and rainbow trout were stocked in the reservoir after it filled, but only a small trout population remains. Warmwater species include largemouth bass, striped bass, redear sunfish, bluegill, black crappie and channel catfish. Striped bass are stocked in the reservoir, but the other species have self-sustaining populations.[131]

[131] Jones & Stokes Associates, Inc., Fisheries Study of the Increased Use of the Existing Russian River Projects Alternative for the Sonoma County Water Agency Water Supply and Transmission System Project, August 1995, 2-23, 24.

Lake Sonoma's fishery is primarily comprised of largemouth bass, redear sunfish, rainbow trout and channel catfish. Smallmouth bass have been planted in the reservoir but are not self-sustaining. Threadfin shad were introduced to supply forage for largemouth bass. The trout spawn in the streams tributary to Lake Sonoma and feed offshore during the remainder of the year.[132]

Table l-V-3
EXOTIC FISH PLANTINGS IN THE RUSSIAN RIVER

Non-Salmonid	Carp	Catfish spp	Lake Whitefish	Largemouth Bass	Smallmouth Bass	Yellow Perch	Bluegill & Green Sunfish	Sacramento Perch	Striped Bass	Crappie spp.
1870-79	5	39.000	10,000	---	---	---	---	---	---	---
1880-89	---	---	---	---	---	---	---	---	---	---
1890-99	---	---	---	6	13,000	10	---	---	---	---
1900-09	---	---	---	---	4,500	---	---	---	---	---
1910-19	---	---	---	---	---	—	18	18	---	18
1920-29	---	---	---	---	---	---	---	---	---	---
1930-39	---	---	---	100	11,045	---	---	---	---	---
1940-49	---	---	---	---	---	---	---	---	---	---
1950-59	---	---	---	---	5,000	---	---	---	---	---
1960-69	---	---	---	---	---	---	---	---	3,000	---
1970-79	---	---	---	---	---	---	---	---	---	---
1980-89	---	---	---	---	---	---	---	---	---	---
1990-95	---	---	---	---	---	---	---	---	---	---
TOTAL:	5	39,000	10,000	106	33,545	10	18	18	3,000	18

Salmonid	Brook Trout	Cutthroat Trout	Lake Trout	Atlantic Salmon
1870-79	29,000	---	---	---
1880-89	---	307,000	---	---
1890-99	100,000	925,000	47,500	---
1900-09	---	---	---	---
1910-19	4,000	---	---	---
1920-29	711,000	---	---	18,000
1930-39	---	---	---	12,000
1940-49	---	---	---	---
1950-59	---	---	---	---
1960-69	---	---	---	---
1970-79	---	---	---	---
1980-89	---	---	---	---
1990-95	---	---	---	---
TOTAL:	844,000	1,232,000	47,500	30,000

The historical record of the abundance of the Russian River fishery is sparse. Federal and state agency records are often limited to brief field observations or gross estimates without significant substantiation. The early cannery records give a feel for the general magnitude of the early salmon presence, but

[132]Ibid., 2-28.

fail to elaborate on species composition. Anecdotal reports from sportswriters and others demonstrate a major presence of steelhead trout in the Russian River, but lack the rigor of a population study. Much of the hatchery and fish planting history consists of highly summarized tables in biennial reports. In response to the lack of a compilation of the data that does exist, in late 1995 the Sonoma County Water Agency retained Steiner Environmental Consulting to collect and evaluate the best available information on the current and historical salmonid fisheries of the Russian River.[133]

Five anadromous fish species existing in the Russian River are economically important. These are steelhead trout, coho salmon, chinook salmon, American shad and striped bass.[134] Steelhead trout and coho salmon are native. The historical existence of chinook salmon is much debated. A fourth salmonid species, pink salmon, once existed in small numbers, but is now believed to be extinct in Russian River.[135] American shad and striped bass are introduced sport fish.

COHO SALMON

Coho salmon were once so prevalent in the Russian River that they supported a commercial fishery. Cannery records give no mention of species, but fish weighing between 8 and 20 pounds, suggesting coho, were a large part of the catch. In 1888, according to the United States Bureau of Fish and Fisheries, 183,597 pounds of fish were caught for cannery and personal use near Duncan Mills. Assuming an average fish weight of 12 pounds, this would represent 15,300 fish, many of which were undoubtedly coho. In 1975 coho escapement in the Russian River was estimated to have declined to 7,000 fish. In 1982 the U.S. Army Corps of Engineers estimated Russian River escapement of coho at 5,000 fish with 300 attributed to Dry Creek.[136]

Historically, coho probably spawned throughout the Russian River basin as far upstream as the East Fork Russian River. Coho may presently spawn naturally in only four tributaries of the Russian River. These are Green Valley Creek, Maacama Creek, Griffin Creek, and Willow Creek. Willow Creek probably retains

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[133]Steiner, History of Salmonid Decline, 1.1-1.

[134]Jones & Stokes, Fisheries Study, 2-7.

[135]Steiner, History of Salmonid Decline, 2.0-1.

[136]Ibid.

the largest natural run on the Russian River.[137]

In January 1994 the National Marine Fisheries Service (NMFS) published a notice of receipt of a petition for listing of coho salmon throughout its range in Washington, Oregon, Idaho and California and to designate critical habitat under the federal Endangered Species Act. In July 1995 NMFS published a proposed rule to list coho salmon as threatened in the central California coastal area. While this area extends northerly to Punta Gorda and includes the Russian River, the proposed rule acknowledged that "the available data for assessing population numbers and trends over time in the northern portion of this ESU are limited for making a determination as to whether or not the ESU warrants listing as threatened or endangered". ESU is an acronym for "evolutionarily significant unit" and in this instance it refers to the central California coast.[138]

Since the mid-1930's, approximately 2.1 million coho salmon have been planted in the Russian River. The first recorded coho were planted in 1937, when 171,500 fish were released, mostly in Mendocino County. No further coho were planted until 1963. Since that time, coho have been consistently planted in the Russian River. Over the period 1963 to 1995, approximately two million coho were planted. From 1940 to 1980 over 137,000 coho were rescued, 44% of which were of introduced stock. North coast streams accounted for most of these introductions.[139]

The Don Clausen fish hatchery at Warm Springs Dam has maintained a successful run of coho salmon since operations began there in late 1980. Since 1986, the returning coho have averaged 260 adults. The hatchery run consists of fish from Prairie Creek, Noyo River, Hollow Tree Creek and the Iron Gate hatchery on the Trinity River. While the effect these and plants from other systems have had on the natural Russian River coho stocks is unknown, it is unlikely any pure native Russian River coho are left.[140]

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[137]Trinity Associates, An Assessment of National Marine Fisheries Service Proposed Rule to List Coho Salmon of the Central California Coast as threatened under the Federal Endangered Species Act, May 1996, 56.

[138]Federal Register, Vol. 59, No. 17. January 26. 1994, commencing at 3662 and Vol.60, No. 142, Tuesday, July 25, 1995, commencing at 38011.

[139]Steiner. History of Salmonid Decline, 3.6-5.

[140]Trinity Associates. NMFS Proposed Rule to List Coho Salmon, 64.

CHINOOK SALMON

The existence of naturally-occurring historic chinook salmon runs in the Russian River is debated. Cannery records from before 1890 indicate most salmon harvested were too small to be chinook. Reports and communications in the 1940's and 1950's suggest the possibility that chinook occasionally penetrated the Russian River in small numbers and that a few were caught in the lower river. More recently, some California Department of Fish and Game biologists have claimed that chinook salmon historically spawned in the upper drainage of the Russian River.[141]

In later years, a larger chinook abundancy resulted from hatchery supplementation. Estimated chinook escapement by the California Department of Fish and Game in 1966 was 1,000 fish. In 1982 the U.S. Army Corps of Engineers estimated chinook escapement at 500 fish. However, these efforts have not resulted in the establishment of a viable chinook run. Returns to the fish hatchery at Warm Springs Dam from 1980 to 1996 range from zero to a high of 304 fish in 1988. Only one chinook arrived in 1993 and 1994 and none in 1995 and 1996. Regardless of origin, hatchery or wild, there are very few chinook salmon presently in the Russian River.[142]

More than eight million chinook salmon have been planted in the Russian River. The first recorded plant took place in 1881, when 15,000 fish were released into the mainstem. The first consistent planting extended from 1949 to 1970. This effort failed to establish a viable population. A second sustained effort began at the Warm Springs Dam hatchery in 1982 and is continuing. The only chinook salmon rescues took place in 1939 and account for only 2,335 fish, all from the Eel River basin. Sources of chinook salmon stocks which have been planted in the Russian River included Sacramento River, Eel River, Silver King Creek, Klamath River, Green River in Wisconsin and Mad River.[143]

STEELHEAD TROUT

Russian River steelhead trout runs were once the third largest in California. Current populations, however, have decreased significantly from historic levels. Early population

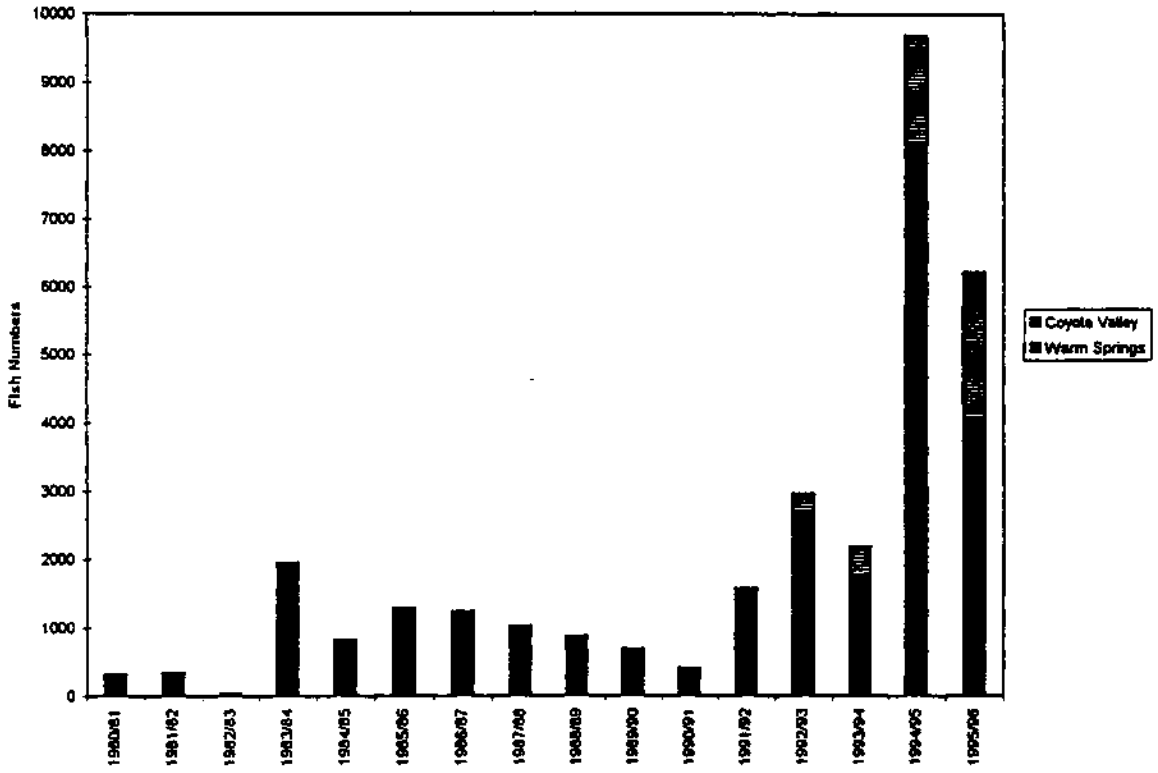
[141]Ibid., 2.0-2.

[142]Ibid.

[143]Ibid., 3.6-3, 4.

estimates are lacking, but anecdotal evidence alludes to large runs of steelhead throughout the entire Russian River basin. During the 1930's through the 1950's the Russian River was renowned as one of the world's finest steelhead streams. The 1936 sport catch of steelhead was estimated at 15,000 fish. The 1957 sport catch was estimated at 25,000 fish with the total steelhead population in the Russian River estimated at 57,000. There are no basin-wide estimates since then but hatchery returns show a large decline. Since 1981, combined return numbers for Warm Springs and Coyote Dams range from a low of 333 fish to a high in 1995 of 10,310 fish. The steelhead returns to the Don Clausen Fish Hatchery and Coyote Valley Dam fish facility from 1980 through 1996 are shown in Figure 1-V-1.[144]

Figure 1-V-1
STEELHEAD RETURNS TO WARM SPRINGS AND COYOTE VALLEY DAM FISH FACILITIES



[144]Ibid., 2.0-3.

In May 1994 the National Marine Fisheries Service (NMFS) published a notice of receipt of a petition for listing of steelhead throughout its range in Washington, Oregon, Idaho and California and to designate critical habitat under the federal Endangered Species Act.[145] On July 30, 1996 officials at the National Marine Fisheries Service announced that they were proposing to list steelhead from Southern California to the Canadian border as either endangered or threatened. In the proposal steelhead from Los Angeles County to the Russian River would be listed as endangered.[146]

At least 30 million steelhead have been planted in the Russian River since 1870. Two major periods of steelhead planting exist. The first period was from 1890 to 1939, peaking in 1920 to 1929 when approximately 5.6 million steelhead were planted. The second period was from 1980 to the present when over 15 million steelhead were planted.[147]

Almost all steelhead planted prior to 1980 were of introduced stocks. Documented plants in the Russian River include stocks from the San Lorenzo River, Scott Creek, Prairie Creek, Eel River, Mad River and Washougal River in Washington. In 1980, the California Department of Fish and Game planting philosophy shifted to planting progeny of adults returning to the Don Clausen Fish Hatchery at Warm Springs Dam. From 1980 until 1989, progeny of these fish comprised 93 percent of the fish planted in the Russian River. Since 1990, all hatchery steelhead planted have been progeny of adults returning to the Warm Springs and Coyote Valley Dam facilities.[148]

AMERICAN SHAD AND STRIPED BASS

Sportfishing for American shad is popular in the Russian River downstream from Healdsburg. American shad reportedly once ranged as far upstream as Ukiah, but their upstream migration has been blocked by the Healdsburg Dam for many years. In 1971 there were an estimated 11,000 to 22,000 shad in the Russian River. No

[145]Federal Register, Vol. 59. No. 102, May 27. 1994, commencing at 27527.

[146]Jody Kleinberg, Steelhead listing as imperiled proposed, The Press Democrat, July 31, 1996, B-1.

[147]Steiner, History of Salmonid Decline, 3.6-3, 4.

[148]Ibid., 3.6-4.

later population estimates exist.[149]

Striped bass once supported a significant sport fishery in the Russian River. In 1924 striped bass weighing 28 and 72 pounds were taken from the Russian River. In 1936 the sport catch was 9,838, and in 1941 it was estimated at 59,000 fish. No population estimates exist since 1941, but striped bass are rare and the population is not thought to be self sustaining in the Russian River.[150]

SALMONID ABUNDANCY DETERMINANTS

A number of interrelated factors have affected the abundancy of the Russian River salmon and steelhead trout. These include the stream geomorphology, ocean productivity, hatchery planting, river flow rate and water temperature, sport and commercial fishing, barriers to migration, watershed practices and inadequate water diversion screening. Some of these factors vary naturally and some are affected by, or occur as a result of, human activities.[151]

Geomorphology

In their natural state, rivers migrate across their valleys. This migration results from the erosion, deposition and transport of sediment in response to naturally changing flows. This process in the Russian River has been significantly affected by land use practices, the construction and operation of dams, and the gravel mining described in Chapter IV.[152]

Prior to these activities, the aquatic and riparian habitats of the Russian River were quite different from present conditions. The river was shallower and wider, meandering across the alluvial valleys. These meanders created oxbows and meandering side sloughs. Seasonal wetlands and backwater marshes were also present. These seasonal habitats created areas for rearing steelhead and coho salmon which no longer exist.[153]

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[149]Ibid., 2.0-4.

[150]Ibid.

[151]Ibid., 3.1-1 through 3.7-4.

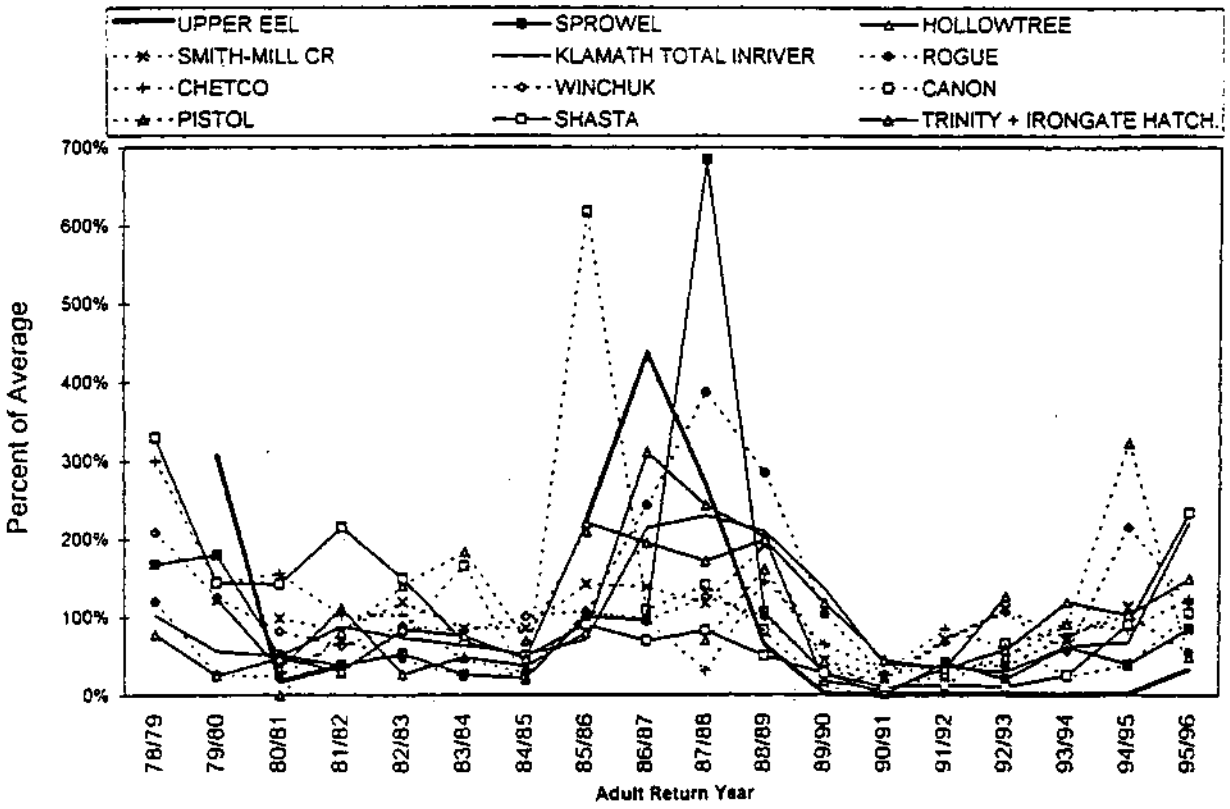
[152]Ibid., 3.4-1.

[153]Ibid.

Ocean Productivity

Chinook salmon escapement indices for several northern California and southern Oregon streams, shown in Figure 1-V-1, reveal a long-term pattern of peak in adult returns in the late 1980's and a dramatic collapse in all streams by 1991. Together with a similar analysis of steelhead return rates, this supports a hypothesis that this major decline was driven by one or more environmental factors common to several river basin in a fairly broad geographical range, the obvious variable being ocean productivity. Climatic regimes affecting juvenile and adult migrations were probably only of minor importance because many of the river systems had regulated flows and local weather patterns varied considerably over the two-state region.[154]

Figure 1-V-1
North Coast Chinook Salmon Escapement Trends
as a Percent of Historical Averages



[154]Ibid., 3.5-1, 5.

Long-term cycles in ocean productivity have been linked to cyclical changes in the strength and direction of major ocean currents. Studies have revealed patterns of climatic and marine influence on a somewhat broader geographic and time range than the chinook analysis. The model developed as part of these studies incorporated the effects of broad-based climatic variables including north Pacific atmospheric pressure, *sea* surface temperatures, and the El Nino southern oscillation phenomenon. These variables are linked to variations in the north-south split of the major east-flowing trans-Pacific current that in turn influence the relative strengths of the Alaska and California currents. A relationship between Gulf of Alaska and west coast salmon populations has been correlated with cyclical changes in these near-shore currents. Coastal upwelling and downwelling is generally considered to be one of the primary mechanisms linking shifts in ocean current patterns with changes in biological productivity throughout the food web in the respective ocean foraging domains.[155]

Cycles in ocean productivity also have been revealed by marine sediment records. Fish scale deposition rates for the Pacific sardine and northern anchovy covering the period from A.D. 270 through 1970 have been measured. A detailed analysis of this data revealed cyclical collapses and recoveries in population levels throughout the 1700 years of record. Because the anchovy is a principal diet item for salmon, it is reasonable to assume that these historical population cycles would be reflected to some degree in salmonid population trends as well.[156]

Hatchery Planting

Hatchery programs have added substantial numbers of salmonids to the Russian River system. As noted above, since 1870, approximately 30 million steelhead, 8 million chinook, and 2.1 million coho have been planted in the basin. In addition, a large number of rescued fish from other basins were planted in the Russian River system. Such large-scale planting can impact native salmonid populations through loss of genetic material, inbreeding, run-time change, competition, predation and desease.[157]

The term "stock" denotes fish that spawn in a particular river system at a particular season, and that do not interbreed to any substantial degree with any group spawning in a different

[155]Ibid., 3.5-1, 2.
[156]Ibid., 3.5-2.
[157]Ibid., 3.6-1.

place, or in the same place at a different season. The term "native" denotes fish descended from original stocks present prior to development. The term "out-of-basin stocks" denotes fish brought into one river basin from another.[158]

There is a relatively recent trend in hatchery management to move away from using non-native salmonid stocks and toward planting progeny of locally returning adults. Prior to 1980, stocks from diverse origins were commonly planted in the Russian River. Historically, at least seven steelhead, six chinook, and five coho stocks were introduced into the Russian River from other basins. Also, prior to 1980, hatcheries often incorporated the practice of cross-breeding fish of different stocks. Due to decades of out-of-basin stock introductions, native Russian River stocks may be forever lost. The predominant fish in the Russian River today is likely a locally adapted stock derived from many stocks and carrying some native Russian River genetic material. During the 1980's and 1990's, the concept of ecological distinctness and genetic fitness of local stocks gained strength. As a consequence, efforts have increased to protect these specific adaptions by propogating locally returning fish in their respective drainages.[159]

River Flow and Water Temperature

As noted in Part 1, Chapter III the construction and operation of the Coyote Valley Dam on the Russian River and the Potter Valley Project on the Eel River, which stores Eel River water and diverts it into the East Fork Russian River, have significantly altered the flow of the Russian River. Table 1-1-III-1 compares the average normal year unimpaired flow of the Russian River at the Hacienda Bridge with the current 125 cfs minimum flow requirement downstream from the Dry Creek confluence. The mean summer unimpaired flows range from 29 to 80 cfs. The current regulated normal year flow always exceeds 125 cfs, usually by substantial amounts.

The increased summer flows substantially expanded the habitat for warm water fishes in the mainstem Russian River. The warm water fish both prey on juvenile salmonids and compete with salmonids for habitat. The increased summer flows also eliminated the stratified pool habitat which is believed to have provided a summer refugia for mainstem-rearing salmonids prior to the regulated summer flows.[160]

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[158]Ibid., 3.6-2.
[159]Ibid.
[160]Ibid., 3.2-2.

Cool water releases from Coyote Dam lower water temperatures in the Russian River downstream from the dam but the benefits diminish below Hopland due to ambient warming. Preferred temperatures for salmonids are between 13 and 20°C. At temperatures above 20°C salmonids suffer stress, between 23 and 26°C salmonids suffer chronic physiological stress, and temperatures above 28°C are lethal. At summer temperatures in the Russian River between Hopland and Cloverdale, salmonids are stressed, and summer temperatures below Cloverdale are too warm for juvenile salmonids.[161]

Cool water released from Warm Springs Dam keeps temperatures in Dry Creek below 16°C which limits warm water fish intrusion into Dry Creek. Figure 1-I-2 in Part 1, Chapter I lists the minimum streamflows which must be maintained in Dry Creek with releases from Lake Sonoma. The normal year summer minimum is 80 cfs. Before Warm Springs Dam was constructed, summer flows in Dry Creek ranged from one to 5 cfs. These increased flows have the effect of expanding the potential salmonid rearing habitat in Dry Creek.[162]

Sport and Commercial Fishing

The Russian River has been a popular angling stream throughout the twentieth century. The winter steelhead was internationally famous and the Russian River's proximity to the San Francisco Bay area made the Russian River accessible to millions of people. As the number of anglers increased, steelhead populations decreased, escalating harvest pressure. Notwithstanding limited catch data, a declining trend is evident. In the 1930's and through the 1950's, anglers were often successful. More than 15,000 steelhead were caught in 1936, and under exceptionally favorable conditions in 1957, roughly 25,000 steelhead were harvested. By the early 1970's the harvest rate declined to approximately 5,000 fish. Fish derbies were ended in Mendocino County in the 1980's.[163]

Juvenile salmonid populations are also affected by angling. In the Russian River, tributary fishing is essentially prohibited. Nevertheless, the harvesting of "trout" remains a significant source of loss for some rearing steelhead populations. This is especially true near urban areas where youthful anglers are often uninformed or unconcerned about

[161]Ibid.

[162]Ibid., 3.2-3.

[163]Ibid., 3.7-3.

regulations.[164]

Ocean harvest is also a potentially large cause of salmonid loss. In addition to targeted harvest, oceanic salmonids may be taken unintentially during the harvest of other types of fish, or taken through high seas drift net fishing. Both accidental and drift net fishing are suspected of affecting oceanic salmonid populations, but impacts are difficult to quantify.[165]

Barriers to Migration

There exist within the Russian River basin a number of barriers and potential barriers to fish migration. These include the Coyote Valley Dam and Warm Springs Dam, other recreational and water supply dams, the bar which forms seasonally at the mouth of the Russian River, and other features. These are discussed in Part 1, Chapter VI, Barriers to Fish Migration.

Watershed Practices

Urbanization, agriculture and logging have all affected the Russian River basin. Urbanization has precipitated a variety of human activities that have had profound effects. Agriculture has impacted the Russian River since the late nineteenth century. By 1900 most land near the Russian River was already under cultivation. Timber harvest has had a major influence on the health of the watersheds supplying runoff to the Russian River and its tributaries. The redwood forests of the lower 20 miles of the river were heavily logged near the turn of the century and again after World War II. Tributary watersheds in the western hills of the basin were also periodically harvested. During the peak timber harvest periods, hillslope and streambank erosion was accelerated by tractor logging on steep slopes, clearing of riparian zones, and logging road construction.[166]

The impact these activities have had on the riparian habitat along the Russian River is described in Part 1, Chapter VII, Riparian Habitat.

Inadequate Water Diversion Screening

Unscreened or inadequately screened water diversion facilities can impact young salmonids. Newly emerged and young fry can either be drawn into water intakes or impinged on intake

[164]Ibid., 3.7-4.

[165]Ibid.

[166]Ibid., 3.7-1, 2.

screens. California Department of Fish and Game policy calls for water intakes being screened where salmonids are present. Criteria for screens limit the approach velocity on the screen to less than one-third of a foot per second, and pressed wire screen openings of 5/32 inch or less. A 1991 survey between Lake Mendocino Drive near Ukiah and the Highway 101 bridge south of Hopland in Mendocino County found 63 punped diversions; eight with proper screen size but unacceptable approach velocities, 51 with improper screens, and four with no screens.[167]

[167]Ibid., 3.7-2, 3.

Chapter VI, Barriers to Fish Migration

INTRODUCTION

There exist within the Russian River basin a number of barriers and potential barriers to fish migration. These include the Coyote Valley Dam and Warm Springs Dam, other recreational and water supply dams, and the bar which forms seasonally at the mouth of the Russian River. They also include barriers created by a combination of human activities natural process, such as streambed erosion and deposition.

DAMS

The Russian River originates in central Mendocino County, approximately 15 miles north of Ukiah. It drains an area of 1,485 square miles, including much of Sonoma and Mendocino Counties, and empties into the Pacific Ocean at Jenner, about 20 miles west of Santa Rosa. The main channel of the Russian River is about 110 miles long. Principal tributaries of the Russian River are the East Fork Russian River, Big Sulphur Creek, Mark West Creek, Maacama Creek and Dry Creek. There are two major dams in the Russian River basin and several hundred smaller dams.[168]

Coyote Valley Dam

Coyote Valley Dam, located on the East Fork Russian River 0.8 mile upstream of the East Fork Russian River confluence with the Russian River, and about 3 miles northeast of the City of Ukiah, was constructed and is operated by the U.S. Army Corps of Engineers. Coyote Valley Dam is a rolled earth embankment with a crest elevation of 784 feet above mean sea level (msl) and 160 feet above the original streambed.[169]

Coyote Valley Dam forms Lake Mendocino, which began storing water for water supply in 1959. The reservoir has a capacity of 118,900 acre-feet at the spillway crest elevation of 764.8 feet above msl. The drainage area upstream from the dam is about 105

[168]Sonoma County Water Agency. Russian River Activities Staff Report, March 1995, 1, 2.

[169]Ibid., 5.

square miles, or 7.1% of the total Russian River basin.[170]

At the time Coyote Valley Dam was constructed, it was believed that the higher Russian River streamflows that would result from the project would mitigate the loss of steelhead spawning and rearing habitat which were cut off by the dam. As a result, no fish hatchery or other mitigating facilities were included in the project. It soon became evident, however, that because of high water temperatures and other reasons, the anticipated benefits would not be realized.[171]

In 1983 a study was authorized to define the needed steelhead mitigation for the Coyote Valley Dam project. The U.S. Army Corps of Engineers determined that the annual production of 4,000 adult steelhead trout was necessary. The Corps also determined that the most appropriate method would be an expansion of the Don Clausen Fish Hatchery at Warm Springs Dam and the construction of new trapping, egg-taking, and imprint facilities at Coyote Valley Dam.[172]

Upon assurances by the Sonoma County Water Agency that the Coyote Valley Dam fish mitigation project costs would be considered by the Agency as joint-use facility costs subject to cost sharing pursuant to the provisions of the existing contract between the Corps and the Agency regarding repayment of the Warm Springs Dam project costs, the Corps proceeded to fund the Coyote Valley Dam fish mitigation facilities determined to be necessary in the Corps study.[173] Construction of the facilities occurred in 1992.[174]

Warm Springs Dam

Warm Springs Dam, located at the confluence of Warm Springs Creek and Dry Creek about 14 miles northwest of Healdsburg, also

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[170]Ibid.

[171]Sonoma County Water Agency, Report to Eel-Russian River Commission on Coyote Valley Dam Fish Mitigation Project, by Robert F. Beach, February 1988, 1.

[172]Ibid.

[173]Sonoma County Water Agency, Resolution of the Board of Directors Providing Assurances Relative to the Coyote Valley Dam Steelhead Mitigation Project, October 6, 1987.

[174]Mendocino County Fish and Game Advisory Commission. Draft Environmental Assessment Proposal for Coyote Valley Dam Fish Hatchery, January 1994, 1.

was constructed and is operated by the U.S. Army Corps of Engineers. Warm Springs Dam is a rolled earth embankment dam with a crest elevation of 519 feet above msl and 319 feet above the original streambed.[175]

Warm Springs Dam forms Lake Sonoma, which became operational for water supply in 1984. Lake Sonoma has a capacity of 381,000 acre-feet at the spillway crest elevation of 495 feet above msl. The drainage area upstream from the dam is about 130 square miles, or 11.4% of the total Russian River basin.[176]

Construction of Warm Springs Dam cut off an estimated 6,000 of the 8,000 steelhead trout run in Dry Creek. It also cut off and estimated 100 of the 300 coho salmon run in Dry Creek.[177] To mitigate for this loss a fish hatchery and ancillary facilities were constructed as part of the Warm Springs Dam project. In addition to mitigation measures for a fish run of 6,000 steelhead trout and 100 coho salmon, the project provided as a fish run enhancement for an additional 1,000 coho salmon and 1,750 chinook salmon. To produce these runs, facilities were constructed to provide fish for the rearing of 300,000 steelhead trout yearlings, 110,000 coho salmon yearlings and one million chinook fingerlings. The hatchery, when constructed, also included certain features to facilitate its expansion to support the subsequent Coyote Valley Dam fish mitigation effort.[178]

Small Dams

Under California water rights law, the diversion of water from a river or stream into storage behind a dam generally requires an appropriative water rights permit or license issued by the Division of Water Rights of the State Water Resources Control Board (SWRCB). The SWRCB maintains a computer-based file of all appropriative water right applications, permits and licenses. These are categorized by county and stream. Single purpose flood control dams which store water only for short periods of time do not require an appropriative water right permit. These dams are discussed in Chapter VIII.

An analysis of the SWRCB files revealed that there are more

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[175]Ibid., 6.

[176]Ibid.

[177]U.S. Army Corps of Engineer. Warm Springs Dam and Lake Sonoma Project Design Memorandum No. 12, December 1972, 8, 9.

[178]U.S. Army Corps of Engineers. Warm Springs Dam and Lake Sonoma. Water Control Manual, September 1984, VIII-4.

than 500 small dams in the Russian River basin for which permits or licenses have been issued by the SWRCB. The purpose of approximately one-half of these is irrigation. An additional 30% provide either a domestic water supply or fire protection. The purposes of the balance are, in rank order of numbers of dams: recreation, stock watering, fish culture, frost protection, fish and wildlife enhancement, industrial water supply, and heat protection. The largest of the reservoirs created by these dams is 3,000 acre-feet. Only three have storage capacity exceeding 1,000 acre-feet. Ninety percent of the reservoirs have under 78 acre-feet of storage capacity. The average storage capacity of the reservoirs is 50 acre-feet and the median storage capacity is 14 acre-feet.

The total storage capacity of all of these small dams is approximately 25,000 acre-feet. In Chapter I the mean annual flow of the Russian River was noted at 1,609,000 acre-feet. Approximately 159,000 acre-feet of this is diverted from the Eel River via the Potter Valley Project. The mean annual runoff in the Russian River basin is therefore approximately 1,450,000 acre-feet. With a drainage area of 1,485 square miles, the average runoff in the Russian River basin is just under one acre foot per acre. Assuming that the total drainage area upstream from the small dams is twice that necessary to fill the dam with average year runoff (in other words, that small dam reservoirs fill in all but the dryer years), the total drainage area upstream from all the small dams would be about 77 square miles, or 5.2% of the total Russian River basin. While this is a rough estimate, it suggests that the probable effect of these dams is relatively small compared to the large dams, which together inpound runoff from 18.5% of the Russian River basin.

BARRIERS CAUSED BY STREAMBED DEGRADATION

Some barriers are created by a combination of human activities and natural processes. An example of such a barrier is the Willow Rubble Dam constructed by the Willow County Water District downstream from the Talmage Road bridge near Ukiah. The rock and concrete slabs were constructed to maintain infiltration into the aquifer adjacent to the District's wells. Due to degradation of the Russian River channel, there now exists a seven foot drop below the structure which constitutes a barrier to fish migration.[179]

Other examples are the boulder grade control structures on

[179]Florsheim and Goodwin, Geomorphic and Hydrologic Conditions. 13.

Ackerman and Hensley Creeks in Mendocino County. These structures were constructed to protect bridge piers from being undercut as the grade of the tributaries degraded to meet the lowered Russian River streambed. In these cases, fish ladders have been constructed.[180]

The Healdsburg Dam is another example. Healdsburg Dam is a 330 feet long dam on the Russian River at Healdsburg. The dam was constructed by Sonoma County in 1953 to create a summer recreational reservoir. This is accomplished by the placing of up to 11 feet high flashboards on the dam substructure. While the flashboards constitute an absolute barrier to fish, it is the substructure of the dam which is the principal cause of concern. It remains in place through the migratory season of anadromous fish. Since the construction of the dam, the streambed has dropped over 10 feet below the dam substructure. As the riverbed degraded and riprap was placed below the dam, passage for salmon and steelhead became hindered under low flow conditions, and the passage of American shad became totally blocked.[181]

SEASONAL DAMS ON THE MAINSTEM

In addition to the Willow Water District's Dam and the Healdsburg Dam, a number of other instream structures are placed seasonally in the mainstem Russian River. These are principally summer road crossings, serving both public roads and private roads associated with gravel mining, and recreational dams. Summer public road crossings include the Cummiskey Station River Ford in Mendocino County and the Asti, Korbel, Guernewood and Vacation Beach crossings in Sonoma County. Recreational Dams include the Del Rio Woods Dam, Johnson's Beach Dam and Vacation Beach Dam in Sonoma County.[182]

A water supply diversion dam, owned and operated by the Sonoma County Water Agency, is located downstream from the Wohler Bridge. This dam consists of a permanent substructure and *a* rubber bladder which is inflated to form an 8.5 feet high differential in water surfaces during low flow periods. This dam

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[180]Ibid.

[181]California Department of Fish and Game, Report to California Fish and Game Commission on the Chronology and Current Status of the Proposed Healdsburg Dam Fishway in Sonoma County, by Boyd Gibbons, December 1994, 1.

[182]U.S. Army Corps of Engineers, Russian River Basin Study, Appendix F, October 1980, B-1 through B-32.

is equipped with two denil-type fishways, one on each side of the dam.[183]

ESTUARY BAR

The Russian River estuary is subject to periodic closure by the formation of a sandbar across the mouth of the estuary. Closures usually occur in the spring, summer, and fall when the Russian River flow is low, with most occurring in the summer months. Artificial breaches of the estuary bar have taken place since at least 1968, when the rising water threatens to flood adjacent buildings and agricultural lands.[184]

Two species of pinnipeds consistently use the area at the mouth of the Russian River. Harbor seals, sometimes numbering in the hundreds, are found at this site all year. From December through June California sea lions also frequent the area, but rarely more than five individuals. Both pinniped species forage for food near the River mouth.[185]

Harbor seals outside the river mouth commonly forage in the surf zone. Normal foraging patterns inside the estuary include searches, chases, and captures during the upriver salmonid and lamprey migrations.[186] Based on the findings of a scat analysis, harbor seals frequenting the mouth of the Russian River appear to feed outside the estuary on slow moving or schooling prey. Lamprey increased in importance in the diet as they migrated through the estuary, but other up-river migrants, including adult salmonids, did not constitute an important part of the harbor seal diet. However, predation on down-river migrating salmonid smolt increased significantly when large numbers of these fish were flushed down the river and trapped inside the estuary.[187]

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[183]Ibid.

[184]Sonoma County. Russian River Estuary Study 1992-1993. January 1994, 44.

[185]Ibid., 153.

[186]Ibid., 158.

[187]Ibid., 160.

Chapter VII, Riparian Habitat

INTRODUCTION

The riparian zone of a stream is the area adjacent to the stream which is affected by flooding, and where direct interactions take place between the aquatic and terrestrial environments. The riparian zone does not necessarily have sharp boundaries. It may include the river channel and its associated vegetation, the area between the outer limit of riparian vegetation and the boundary of the current floodplain, and the historical floodplain to the extent that it contributes sediment and nutrients during major flooding events.[188]

Riparian habitat is important to the ecological health of a stream. Half of the reptiles and three-fourths of the amphibians in California are dependent upon riparian habitat. A diversity of bird species also utilize riparian habitat. It contributes scour pools, woody debris and root mass to streams which provides shelter for fish and aquatic animals. It contributes nutrients in the form of leaf litter and insects for fish and aquatic organisms. It helps maintain cool water temperatures by shading all or part of the stream. It supports wildlife corridors, offering shelter and forage. It stabilized stream banks and prevents erosion.[189]

HISTORIC CONDITION OF RIPARIAN ZONE

There is a scarcity of good information on early conditions in the Russian River basin. However, it is thought that Native Americans had already altered the landscape in the Russian River basin long before European settlement through the practice of burning grasses in the understory of oak woodland areas.[190]

The first European settlers arrived in Sonoma and Mendocino Counties in the early 1800's. Travelers' dairies of the early post-settlement period describe heavily wooded floodplains, extensive freshwater marshes in some locations, an abundance of

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[188]Circuit Rider Productions, Inc., Draft Riparian Habitat Status Report, by Bob Teytaud and Karen Gaffney, January 1994, 1, 2.

[189]Ibid., 3.

[190]Ibid., 3.

fish and shorebirds, great numbers of waterfowl, and large wildlife species including deer, elk, pronghorn antelope, cougar, bobcat, coyote, wolf, fox, otter, black bear and grizzly bear.[191]

HABITAT FRAGMENTATION

The relationships between riparian and terrestrial habitats strongly affect diversity, quality and distribution of plant and wildlife populations and communities present. Riparian zones in a near-natural state contain a relatively high diversity of landforms, vegetation types and successional stages concentrated in a small area. They are especially attractive to wildlife largely because an adequate mix of habitat types, food, and shelter is consistently available even in the face of natural disturbances.[192]

The total number of plant and animal species living in riparian zone habitats is typically greater than in the adjacent upland habitats. The numbers are increased by the yearly migratory movements of aquatic, terrestrial and aerial animals through the river valley. Detrimental effects on riparian systems can be caused by habitat fragmentation, that is, the creation of smaller, isolated remnants of a formerly continuous riparian habitat. Habitat fragmentation can eliminate populations of large free-ranging animals which need large home ranges within a certain habitat type to survive. It can lead to the extirpation of species populations restricted to isolated patches due to loss of genetic integrity and viability. It can lead to the extirpation of those species populations which are dependent on certain conditions in the interior of a given habitat type because fragmentation reduces the percentage of interior habitat. It creates conditions for the spread of exotic or weedy plant species and opportunistic wildlife at the expense of native species or species which are more specialized in their habitat requirements.[193]

The shape of habitat patches and their connections or proximity to other patches exert a strong influence on the species diversity of an area and the ability of wildlife and plants to disperse to other areas. The hills and low mountains of the North Coast Range adjacent to the Russian River contain large blocks of relatively intact semi-natural vegetation where

[191]ibid., 4.

[192]Ibid., 8.

[193]Ibid.

conifer forests are intermixed with hardwood forests, chaparral and grasslands, providing habitat for many species of wildlife. The riparian zone of the Russian River is believed to serve as an important dispersal corridor for wildlife, including many species from these adjacent non-riparian habitats.[194]

RIPARIAN HABITAT SURVEY

In 1993 Circuit Rider Productions, Inc. completed data gathering, mapping and a riparian habitat analysis along three reaches of the Russian River. These reaches are the middle reach extending from Healdsburg Bridge to Wohler Bridge, the Alexander Valley reach extending from Cloverdale to the Jimtown Bridge, and the Mendocino County reach extending from Redwood Valley to Hopland.[195]

The extent of mainstem Russian River riparian vegetation in the middle reach was mapped as of 1942 and 1990 from river mile 23 through 34. The riparian vegetation and wetted channel was delineated and tabulated for each river mile. The total 1942 corridor acreage studied in Mendocino County was 7,425 acres. This represents a study area corridor length of 12 miles with an average width of just under one mile. In 1942, 17% of the study area corridor was riparian vegetation, consisting of 1,231 acres. The mainstem wetted channel occupied 152 acres, or 2% of the riparian corridor. By 1990 the riparian vegetation had declined to 827 acres, a reduction of 33%.

Other land uses in the study area corridor in the middle reach were tabulated as of 1990 and 1940. The principal other uses in 1990 were 2,906 acres of vineyard (39%), 496 acres of orchard (7%), 795 acres of other agriculture (11%) and 1,407 acres of residential, commercial, industrial, open land and transportation corridors (19%). A total of 1,653 acres was vegetated (22%), which includes upland vegetation as well a riparian vegetation.[197]

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[194]Ibid., 9.

[195]Ibid., 1.

[196]Circuit Rider Productions, Inc. . Russian River Resource Enhancement Plan. Terrestrial Acreage Statistics by River Mile, Middle Reach: 1990 and 1940. Draft.

[197]Circuit Rider Productions, Inc., Russian River Resource Enhancement Plan, Acreage by Landuse/Landcover: Middle Reach -1990 and 1940, Draft.

The extent of mainstem Russian River riparian vegetation in the Alexander Valley was mapped as of 1940/1942 from river mile 49 through 53, and from river mile 60 through 64. It was mapped as of 1990 from river mile 46 through 64. The riparian vegetation and wetted channel was delineated and tabulated for each river mile. The total 1940/1942 corridor acreage studied in the Alexander Valley was 6,302 acres. This represents a study area corridor length of 10 miles with an average width of just under one mile. In 1940/1942, 33% of the study area corridor was riparian vegetation, consisting of 2,073 acres. The mainstem wetted channel occupied 136 acres, or 2% of the study area corridor. By 1990 the riparian vegetation within the reaches where 1040/1942 data was available had declined to 983 acres, a reduction of 53%.[198]

The total 1990 corridor acreage studied in the Alexander Valley was 12,019 acres. This represents a study area corridor length of 19 miles with and average width of just under one mile. In 1990, 20% of the study area corridor was riparian vegetation, consisting of 2,312 acres. The mainstem wetted channel occupied 220 acres, or 2% of the riparian corridor.[199]

Other land uses in the study area corridor in the Alexander Valley were tabulated as of 1990. The principal other uses were 5,640 acres of vineyard (48%), 333 acres of orchard (3%), 634 acres of other agriculture (5%) and 1,576 acres of residential, commercial, industrial, open land and transportation corridors (13%). A total of 3,396 acres was vegetated (29%), which includes upland vegetation as well a riparian vegetation.[200]

The extent of mainstem Russian River riparian vegetation in Mendocino County was mapped as of 1940 and 1990 from river mile 75 through 100. The riparian vegetation and wetted channel was delineated and tabulated for each river mile. The total 1940 corridor acreage studied in Mendocino County was 7,929 acres. This represents a study area corridor length of 26 miles with an average width of just under one-half mile. In 1940, 15% of the study area corridor was riparian vegetation, consisting of 1,172

[198]Circuit Rider Productions, Inc., Russian River Resource Enhancement Plan, Acreage Statistics by River Mile, Alexander Valley Reach. 1990 & 1940/42. River Miles: 49-53 & 60-64. Draft.

[199]circuit Rider Productions, Inc., Russian River Resource Enhancement Plan. Acreage Statistics by River Mile, Alexander Valley Reach. 1990. Draft.

[200]Circuit Rider Productions. Inc., Russian River Resource Enhancement Plan, Acreage by Landuse/Landcover: Alexander Valley Reach: 1988, Draft.

acres. The mainstem wetted channel occupied 219 acres, or 2% of the riparian corridor. By 1990 the riparian vegetation had declined to 816 acres, a reduction of 30%.[201]

Other land uses in the study area corridor in Mendocino County were tabulated as of 1988. The principal other uses were 2,132 acres of vineyard (28%), 2,418 acres of orchard (31%), 587 acres of other agriculture (7%) and 955 acres of residential, commercial, industrial, open lands and transportation corridors roads (13%). A total of 1,485 acres was vegetated (19%) , which includes upland vegetation as well a riparian vegetation.[202]

VEGETATION AND WILDLIFE

The biotic diversity of the riparian zone depends upon its ability to generate and support a complete range of habitats. Habitat types found in the riparian zone of the Russian River include open habitats (ephemeral pools, freshwater marshes and ponds), immature communities (riparian scrub, forb and grass communities), developing forests, and mature forests.[203]

The amount of riparian habitat in the middle reach of the Russian River varies from just a few acres to over 150 acres per river mile. The median amount is 70 acres and the mean is 69 acres per river mile. Most of the habitat is in an immature (35%) or developing (39%) stage, with only 16% in a mature stage. The mature stands in the middle reach are highly fragmented.[204]

The amount of riparian habitat in the Alexander Valley reach varies from about 30 acres to over 200 acres per river mile. The median amount is 88 acres and the mean is 98 acres per river mile. The successional status of the habit in the Alexander Valley reach above Geyserville is markedly different from that of the middle reach. Not only does the Alexander Valley reach have more open habitat (20% compared to 10% in the middle reach), it

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[201]Circuit Rider Productions, Inc., Russian River Resource Enhancement Plan, Terrestrial Acreage Statistics by River Mile, Mendocino County: 1990 & 1940. Draft.

[202]Circuit Rider Productions. Inc., Russian River Resource Enhancement Plan. Acreage by Landuse/Landcover: Mendocino County 1988. Draft.

[203]Sonoma County. Management Plan and EIR, 4.6-11 through 4.6-16

[204]Ibid., 4.6-17.

has more habitat in the immature stage (49%) and mature stage (22%). The greatest difference, however, is in the developing forests, making up only 9% of the total riparian vegetation along the Alexander Valley reach, compared to 39% in the middle reach.[205]

The mature stands along the river in the Alexander Valley above Geyserville are at an optimal stage for biodiversity. Most of them contain significant numbers of huge cottonwoods. The occasional Cottonwood has died, providing nesting and roosting habitat for birds. Black walnuts and some Oregon ash are present. The understory has a layering of vines such as California blackberry and California wild grape. There are nine separate mature stands of over 15 acres each with these characteristics, compared with just 3 such stands along the middle reach. Of the mature forest acreage, 75% is in contiguous stands compared to 40% in the middle reach where a majority of the mature stands are fragmented remnants.[206]

The amount of riparian vegetation in the Mendocino County reach varies from less than 10 acres to a maximum of 75 acres per river mile. The median amount is only 27 acres and the mean is 31 acres per river mile.[207]

[205]Ibid., 4.6-22.

[206]Ibid., 4.6-24.

[207]Circuit Rider, Terrestrial Acreage Statistics, Mendocino County.

Chapter VIII, Flood and Erosion Control

INTRODUCTION

The location of the streamflow gauges and major flood control reservoirs on the Russian River system are shown on the schematic diagram in Figure 1-VIII-1. As noted in Chapter I, annual runoff from the Russian River watershed is highly variable. The annual discharge of the Russian River at Hacienda (gauge 467000 on Figure 1-VIII-l) is shown in Graph 1-I-1 for the period for which records exist, 1940 through 1994. As stated, during this period, the mean annual flow was 1,609,000 acre-feet with the extremes varying from 4.0 percent of normal (1977) to 265 percent of normal (1983). The daily flow of the Russian River and its tributaries is even more variable. The maximum discharge of record of the Russian River at Hacienda is 102,000 cfs which occurred February 18, 1986. The minimum discharge of record at Hacienda is 0.75 cfs which occurred May 6, 1977.

There are four gaging stations on the Russian River in Mendocino County. The maximum discharge of record of the West Fork Russian River (gauge 461000) is 18,900 cfs which occurred December 21, 1955. The maximum discharge of record of the East Fork Russian River near Capella (gauge 461500) is 18,700 cfs which occurred December 22, 1964. The maximum discharge of record of the East Fork Russian River just downstream from Coyote Valley Dam (gauge 462000) is 13,300 cfs which occurred December 21, 1955. Since the construction of the dam the maximum discharge has been 7,350 cfs which occurred January 24, 1970. The maximum discharge of record of the Russian River near Hopland (gauge 462500) is 45,000 cfs which occurred December 22, 1955.[209]

Besides the gauge at Hacienda, there are two other gaging stations of interest on the mainstem Russian River in Sonoma County. The maximum discharge of record of the Russian River near Cloverdale (gauge 463000) is 55,200 cfs which occurred December 22, 1964. The maximum discharge of record of the Russian River near Healdsburg (gauge 464000) is 71,300 cfs which occurred December 23, 1964.[210]

There are three gaging stations on Dry Creek. The maximum

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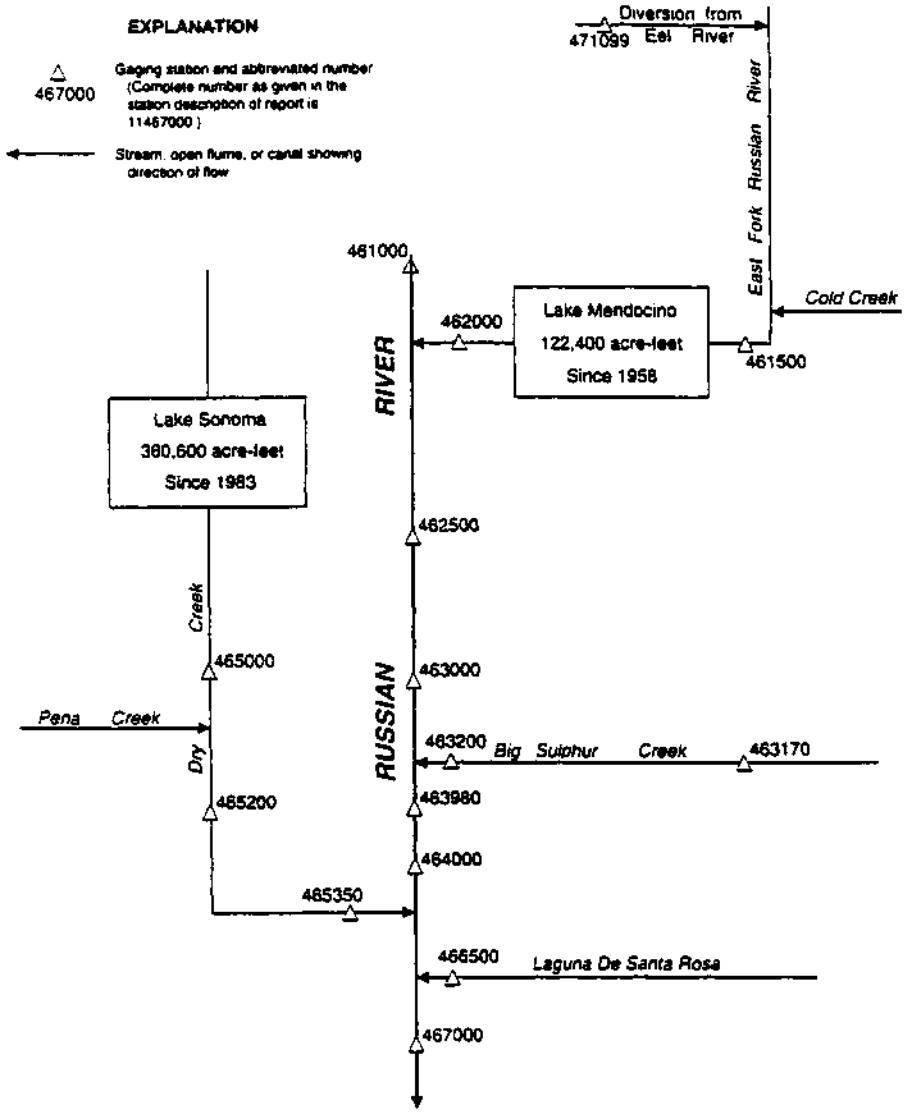
[208]USGS. Water Resources Data, Water Year 1994, 204, 233.
[209]Ibid., 205 through 214.
[210]Ibid., 215, 221.

discharge of record just downstream from Warm Springs Dam (gauge 465000) is 22,500 cfs which occurred February 28, 1940. Since the construction of Warm Springs Dam the maximum discharge has been 4,220 cfs which occurred January 23, 1993. The maximum discharge of record near Yoakim Bridge (gauge 465200) is 32,400 cfs which occurred January 31, 1963. Since the construction of Warm Springs Dam the maximum discharge has been 6,960 cfs which occurred January 20, 1993. The gauge near the mouth of Dry Creek (gauge 465350) has a poor control section for high flows and is only used to record summer flows.[211]

Figure 1-VIII-1
Russian River System Streamflow Gaging Stations



[211]Ibid., 225 through 231.

Since October 1980 a streamflow gauge has been maintained on Big Sulphur Creek 12 miles east of Cloverdale (463170). The maximum discharge of record of Big Sulphur Creek is 5,700 cfs which occurred February 17, 1986.[212]

A water stage recorder is maintained on the Laguna de Santa Rosa at the Guerneville Road bridge. The Laguna is a natural water channel and overflow basis connecting Santa Rosa Creek, Mark West Creek and other smaller creeks with the Russian River. During floods, the Laguna acts as a natural regulator of floods on the lower Russian River and the directions of flow may be either to or from the Russian River. The maximum water level elevation of record is 74.6 feet which occurred February 18, 1986.[213]

Floods occur during the rainfall season from November through April. Normally, floods are flashy since the times of concentration on tributaries are short and streamflows respond rapidly to rainfall. Concentration times vary from less than four hours on the smaller tributaries to about 36 hours at Guerneville.[214]

COYOTE VALLEY DAM

The principal flood control facility on the mainstem Russian River is Coyote Valley Dam, located on the East Fork Russian River 0.8 mile upstream of the East Fork Russian River confluence with the Russian River, and about 3 miles northeast of the City of Ukiah. It was constructed and is operated by the U.S. Army Corps of Engineers. Coyote Valley Dam forms Lake Mendocino, which began storing water in 1958. As noted in Chapter VI, the reservoir has a capacity of 118,900 acre-feet at the spillway crest elevation of 764.8 feet above msl. The drainage area upstream from the dam *is* about 105 square miles, or 7.1% of the total Russian River basin.[215]

Releases are made from the flood control pool of Lake Mendocino by the U.S. Army Corps of Engineers in accordance with a flood control diagram shown as Figure 1-VIII-2. The basic

[212]Ibid., 217.

[213]Ibid., 232.

[214]U.S. Army Corps of Engineers, Coyote Valley Dam and Lake Mendocino, Water Control Manual, August 1986, IV-7.

[215]SCWA. Russian River Activities, 5.

flood control operating criteria of the Corps of Engineers for Coyote Valley Dam is to avoid discharges from the reservoir in excess of 6,400 cfs to the extent possible. Releases are not increased or decreased at a rate greater than 1,000 cfs per hour. When flow in the West Fork Russian River (gauge 461000) exceeds 2,500 cfs and is rising, releases from Lake Mendocino are reduced to 25 cfs. Flood releases which would contribute to flows greater than 8,000 cfs at Hopland (gauge 462500) are not made insofar as possible.[216]

WARM SPRINGS DAM

The principal flood control facility on Dry Creek is Warm Springs Dam, located at the confluence of Warm Springs Creek and Dry Creek about 14 miles northwest of Healdsburg. Warm Springs Dam forms Lake Sonoma, which began storing water in 1983. As noted in Chapter VI, Lake Sonoma has a capacity of 381,000 acre-feet at the spillway crest elevation of 495 feet above msl. The drainage area upstream from the dam is about 130 square miles, or 11.4% of the total Russian River basin.[217]

Releases are made from the flood control pool of Lake Sonoma by the U.S. Army Corps of Engineers in accordance with a flood control diagram shown as Figure 1-VIII-3. The basic flood control operating criteria of the Corps of Engineers for Warm Springs Dam is to avoid discharges from the reservoir in excess of 6,000 cfs to the extent possible. Releases are not increased or decreased at a rate greater than 1,000 cfs per hour unless the reservoir level is more than seven feet above the spillway crest. When inflows to Lake Sonoma exceed 5,000 cfs, no releases are made unless the reservoir is more than seven feet above the spillway crest. No releases are made which would contribute to flows greater than 35,000 at Guerneville insofar as possible. When the precipitation forecast is for one inch of rainfall during the next 24-hour period or for 0.5 inch during any 6-hour period, releases are limited to 2,000 cfs to the extent possible.[218]

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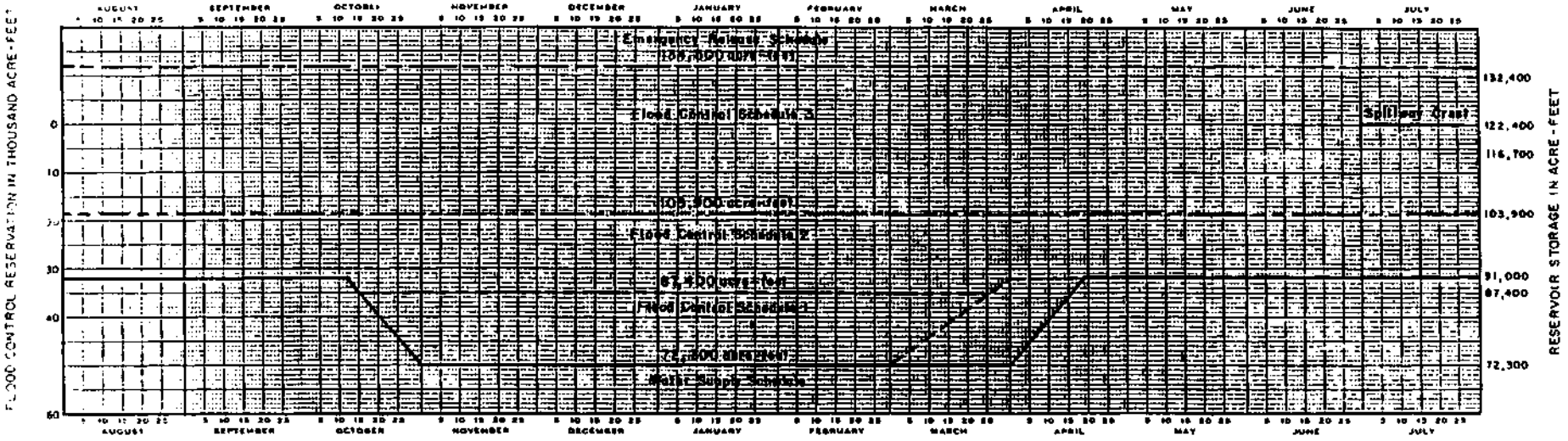
[216]Corps of Engineers. Lake Mendocino Water Control Manual, Chart A-10.

[217]SCWA, Russian River Activities, 5.

[218]Corps of Engineers. Lake Sonoma Water Control Manual, Chart A-12.

Figure 1-VIII-2

Coyote Valley Dam and Lake Mendocino Flood Control Diagram



RELEASE SCHEDULES

WATER SUPPLY SCHEDULE
As directed by Sonoma County Water Agency

FLOOD CONTROL SCHEDULE 1
2,000 cfs up to a maximum release of 4,000 cfs depending on antecedent ground conditions, and time of year, subject to limitations 1-3, shown hereon

FLOOD CONTROL SCHEDULE 2
4,000 cfs subject to limitations 1-3, shown hereon

FLOOD CONTROL SCHEDULE 3
6,400 cfs subject to limitations 1-3, shown hereon.

Gates may be used when pool is above spillway crest (elevation 784.8) for Flood Control Schedule 3 releases, however the sum of the spill and the releases must not exceed 6,400 cfs (i.e. – outlet discharge is reduced as spillway discharge increases), and should not exceed limitations 1-3, shown hereon, to the extent possible

NOTES

1. The Corps of Engineers will reduce the flood control space on the 1st of March if it is determined the flood control functions of the project will not be impaired
2. Normally, the summer pool elevation will be kept at 748.0 to maximize recreational opportunities at the reservoir. However Sonoma County Water Agency retains the right to raise the summer pool elevation to 761.8

USE OF DIAGRAM

1. Releases from the reservoir will be made in accordance with the highest schedule reached during the current flood shown on the accompanying diagram subject to the applicable limitations.
2. The Corps of Engineers may direct that flood releases be increased or decreased from those required by the diagram depending on conditions prevailing at the time

EMERGENCY RELEASE SCHEDULE

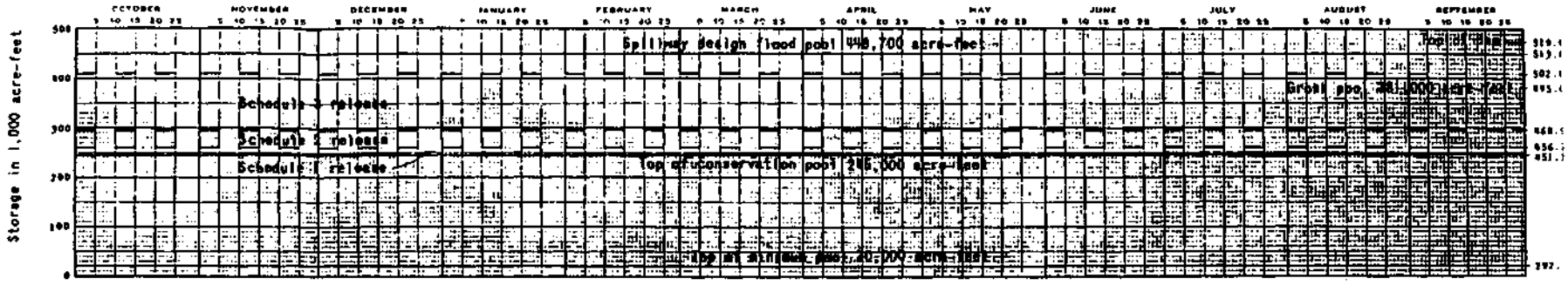
Reservoir Pool Elevation	Gate Releases
771.0	0
771.0-771.3	800
771.3-771.5	1,700
771.5-771.8	2,500
771.8-772.0	3,300
772.0-772.3	4,200
772.3-772.5	5,000
772.5-772.8	5,800
772.8-773.0	6,600
773.0 and above	7,500 (gates 100% open)

LIMITATIONS

1. Releases will not be increased or decreased at a rate greater than 1,000 cfs per hour.
2. When flow in the West Fork of the Russian River at Ukiah exceeds 2,500 cfs and is rising, releases from Lake Mendocino will be reduced to 25 cfs, insofar as possible.
3. Flood releases which will contribute to flows greater than 8,000 cfs at Hopland, will not be made, insofar as possible.

Figure 1-VIII-3

Warm Springs Dam and Lake Sonoma Flood Control Diagram



USE OF DIAGRAM

1. Releases from the reservoir will be made in accordance with the schedules shown on the accompanying diagram subject to the applicable limitations.
2. The Corps of Engineers may direct that flood releases be increased or decreased from those required by the diagram depending on conditions prevailing at the time.

RELEASE SCHEDULES

WATER SUPPLY SCHEDULE

As directed by the Sonoma County Water Agency

FLOOD CONTROL SCHEDULE 1 RELEASE BETWEEN 245,000 ACRE-FEET AND 280,000 ACRE-FEET 2,000 cfs subject to limitations 1-4

FLOOD CONTROL SCHEDULE 2 RELEASE BETWEEN 280,000 ACRE-FEET AND 295,000 ACRE-FEET 4,000 cfs subject to limitations 1-4

FLOOD CONTROL SCHEDULE 3 RELEASE BETWEEN 295,000 ACRE-FEET AND 408,000 ACRE-FEET 6,000 cfs subject to limitations 1-4

NOTE:
From spillway crest (elevation 485) to elevation 502.0, the combined spill and release should not exceed 6,000 cfs.

EMERGENCY RELEASE SCHEDULE

Reservoir Pool Elevation	Gate Release
502.0 - 502.3	800
502.3 - 502.6	1,600
502.6 - 502.9	2,400
502.9 - 503.2	3,100
503.2 - 503.6	3,800
503.6 - 503.9	4,600
503.9 - 504.3	5,300
504.3 - 504.7	6,000
504.7 - 505.0	7,000
505.0 and above	7,900 (flood control gates 100% open)

LIMITATIONS

1. When the reservoir pool elevation is at or below 502.0 and inflow is at or above 5,000 cfs, no gate releases will be made.
2. When the reservoir pool elevation is at or below 502.0, no flood releases will be made which will cause the Russian River flow at Guerneville to exceed 35,000 cfs or add to larger flows.
3. When the QPF is 1 inch or more for the next 24 hours or .5 inches or more for any 6-hour period in the next 24, outflow from the reservoir will be limited to 2,000 cfs or less to the extent possible.
4. Flood releases will not be changed at a rate greater than 1,000 cfs per hour when the pool elevation is at or below 502.0.

CENTRAL SONOMA WATERSHED PROJECT

The principal flood control facility on the tributaries of the Russian River is the Central Sonoma Watershed Project which was constructed by the Sonoma County Water Agency in cooperation with the U.S. Department of Agriculture, Soil Conservation Service. The work plan for this project was completed in 1958 and the project was constructed over the ensuing 25 years. The project included the construction of floodwater retarding structures and the straightening, shaping and stabilization of waterways. The project protects the Santa Rosa urban area from flooding.[219]

The Central Sonoma Watershed Project includes five reservoirs. These are Santa Rosa Creek Reservoir, (also known as Spring Lake), Matanzas Creek Reservoir, Piner Creek Reservoir, Brush Creek Middle Fork Reservoir and Spring Creek Reservoir. Data on these reservoirs is shown in Table 1-VIII-1.[220]

Table 1-VIII-1
Central Sonoma Watershed Project Reservoir Data

Reservoir	Drainage	Storage	Flood Peak Reduction
Santa Rosa Creek	20.8 sq.mi.	3,500 AF	4,730 cfs
Matanzas Creek	11.6 sq.mi.	1,500 AF	3,500 cfs
Piner Creek	2.2 sq.mi.	230 AF	600 cfs
Brush Creek Middle Fork	1.6 sq.mi.	130 AF	455 cfs
Spring Creek	2.3 sq.mi.	467 AF	830 cfs

Santa Rosa Creek Reservoir is located offstream. The diversion structure on Santa Rosa Creek allows relatively large flows to pass downstream unimpeded. The other four reservoirs are onstream and are equipped with minimum flow bypass facilities. Unlike the large dams on the mainstem Russian River

[219]Watershed Work Plan. Central Sonoma Watershed. Sonoma County. California, April 1958, 2.

[220]Ibid. 84.

and Dry Creek, these reservoirs are not equipped with flood gates and the reservoirs operate passively. Nevertheless, the reservoirs cause proportionately large reductions in streamflow during flood events, with the percentage reduction varying from 49% to 82%. The largest reservoir, Santa Rosa Creek, reduces the 1% frequency design flood from 6,120 cfs to 1,390 cfs, a 77% reduction.

The waterways which were straightened, shaped and stabilized as part of the Central Sonoma Watershed Project include parts of Santa Rosa Creek, Wendel Creek, Petersen Creek, Forestview Creek, Matanzas Creek, Piner Creek, Paulin Creek Russell Creek, Brush Creek, Rinconada Creek, Ducker Creek, Austin Creek and Spring Creek. Santa Rosa Creek and Matanzas Creek stabilization measures include substantial use of concrete and riprap. Most of the other channels are sod with limited use of riprap. The approximate length of channelization, watershed area and design flow of these waterways is shown in Table 1-VIII-2.[221]

Table l-VIII-2 Central Sonoma Watershed Project Channel Data[222]

Creek	Length	Drainage	Maximum Design Flow
Santa Rosa	7.9 mi.	76.8 sq.mi.	11,020 cfs
Wendel	1.1 mi.	2.8 sq.mi.	1,020 cfs
Petersen	0.9 mi.	1.3 sq.mi.	470 cfs
Forestview	0.4 mi.	0.6 sq.mi.	332 cfs
Matanzas	0.4 mi.	22.5 sq.mi.	3,900 cfs
Piner	3.1 mi.	13.4 sq.mi.	3,990 cfs
Paulin	2.1 mi.	5.0 sq.mi.	1,500 cfs
Russell	1.1 mi.	1.0 sq.mi.	464 cfs
Brush	1.6 mi.	9.9 sq.mi.	3,730 cfs

[221]Ibid., 86.

[222]Common names of creeks and lengths channelized were researched by Robert Morrison, Sonoma County Water Agency, and personally communicated on April 16, 1996.

Table 1-VIII-2, Con'd.

Creek	Length	Drainage	Maximum Design Flow
Rinconada	0.6 mi.	1.6 sq.mi.	650 cfs
Ducker	0.1 mi.	0.7 sq.mi.	370 cfs
Austin	0.8 mi.	4.2 sq.mi.	1,838 cfs
Spring	1.3 mi.	5.8 sq.mi.	1,220 cfs

LAGUNA DE SANTA ROSA

As noted above, the Laguna de Santa Rosa is a natural water channel and overflow basin connecting Santa Rosa Creek, Mark West Creek and other smaller creeks with the Russian River. Although a natural feature, the Laguna very effectively attenuates flooding on the lower Russian River. The total watershed of the Laguna de Santa Rosa encompasses 254 square miles. It is the largest watershed tributary to the Russian River.[223]

During the December 1964 storms, which produced the greatest discharges of record in the upper portions of the Russian River, a peak flow of 111,000 cfs was estimated in the Russian River immediately upstream from the Laguna. If the flow from the Laguna watershed had entered the Russian River, the flood stage at Guerneville would have been an estimated 14 feet higher than actually occurred. However, during the flood peak on the Russian River, the Laguna stored approximately 80,000 acre-feet of water, reducing the flow which otherwise would have occurred in the lower Russian River by an estimated 40,000 cfs. Part of this water was runoff from the Laguna watershed and part was water which flowed from the Russian River into the Laguna.[224]

RUSSIAN RIVER CHANNEL

The flow capacity of the Russian River channel at bankfull stage varies with the stream slopes and cross-section geometry.

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[223]Sonoma County Flood Control and Water Conservation District. FLOOD!! December 1964 - January 1965, 20.

[224]Ibid.

In general, the rocky gorge reaches have larger capacities than do the valley reaches. Bankfull capacity was estimated, based upon cross-sections surveyed in 1992, as ranging from 3,000 to 14,500 cfs in the reach between the Highway 101 bridge and Hopland. Based upon 1991 cross-section data, the capacity in the Alexander Valley reach was estimated as ranging from 18,300 to 61,500 cfs, while the capacity in the middle reach was estimated to range from 28,000 to 88,000 cfs.[225]

Flood bulletins are issued by the California Nevada River Forecast Center for the Russian River at Hopland, Healdsburg and Guerneville. Table 1-VIII-3 lists the warning and flood stages at the gaging stations and the corresponding flows. There is no streamflow gauge at Guerneville and the warnings at Guerneville are based upon the readings at the Hacienda Bridge gauge.[226]

Table l-VIII-3
Russian River Flood Stages and Flows

Streamflow Gauge	Gauge Reading	Streamflow
Hopland (gauge 462500)		
Warning Stage	18.0 feet	18,800 cfs[227]
Flood Stage	21.0 feet	26,610 cfs
Healdsburg (gauge 464000)		
Warning Stage	15.0 feet	28,500 cfs[228]
Flood Stage	19.0 feet	42,500 cfs
Guerneville (gauge 467000)		
Warning Stage (29.0 feet)	31.0 feet	37,940 cfs[229]
Flood Stage (32.0 feet)	34.0 feet	45,770 cfs

[225]Florsheim and Goodwin, Geomorphic and Hydrologic Conditions, 26.

[226]Sonoma County Water Agency. Emergency Operations Plan, Revision No. 5, February 1995, 1, 5, 14.

[227]U.S. Geological Survey. EXPANDED RATING TABLE, RUSSIAN R NR HOPLAND CA, effective 10-01-1991.

[228]U.S. Geological Survey. EXPANDED RATING TABLE. RUSSIAN R NR HEALDSBURG CA, effective 03-05-1991.

229U.S. Geological Survey. EXPANDED RATING TABLE. RUSSIAN R NR GUERNEVILLE CA, effective 10-01-1994.

BANK STABILIZATION AND EROSION CONTROL

The U.S. Army Corps of Engineers has constructed stabilization and erosion control works on both the Russian River and Dry Creek channels. The Corps of Engineers projects were constructed to prevent erosion aggravated by releases of water from the dams. Also, individual property owners have placed car bodies, tires, logs tied with cable and broken concrete blocks along short stretches of the banks of the channel in an attempt to stabilize the banks.[230]

The Corps of Engineers channelization projects on the Russian River were constructed in conjunction with the Coyote Valley Dam Project. In Sonoma County, the installations were made at 41 different locations extending throughout the Alexander Valley. The channel stabilization works were constructed over a period of several years extending from 1956 through 1963. The constructed works included channel clearing and pilot channels; bank protection works consisting of anchored steel jacks in single and multiple row installations; flexible fence training structures; wire mesh-gravel revetments and pervious erosion check dams. Channel clearing consisted of removing obstructions such as trees and gravel bars from the channel. Pilot channels consisted of a trapezoidal channel, with a uniform bottom width, side slopes and gradient. The type of bank stabilization constructed depended upon the site. Anchored steel jacks and flexible fencing were used to prevent banks from undercutting. Jacks were used at those sites where the banks, although relatively well protected by vegetation, were subject to erosion. Flexible fencing was installed where the banks lacked vegetation. A gravel blanket revetment, overlain by wire mesh, was used were it was deemed desirable to rigidly maintain existing bank alignment. Pervious erosion dams were installed to control sheet erosion.[231]

While these stabilization works were installed by the Corps of Engineers, under federal law local interests generally have maintenance responsibility. In Sonoma County that local interest is the Sonoma County Water Agency. Many of the works constructed by the Corps of Engineers were subsequently destroyed or severely damaged by flood flows. While these were normally replaced by the Agency in kind, at a number of locations more substantial erosion control works were constructed in lieu of repairing or

[230]Ibid., 23.

[231]U.S. Army Corps of Engineers. Russian River Channel Improvement, Sonoma County, Operation and Maintenance Manual, July 1965, 1, 2.

replacing the inadequate works. In several instances, these replacement works consisted of riprapped levees. This construction was usually done with financial assistance from the Public Law 99 disaster assistance program administered by the Corps of Engineers. At some sites, the works were subsequently buried by accumulated sediment. Having effectively served their purpose, the Agency no longer has any maintenance responsibility at these sites.[232]

In Mendocino County, similar channelization works were constructed by the Corps of Engineers. These installations were located at intermittent sites along a 15 mile reach of the Russian River extending from about 5 miles north of Hopland to Calpella. As in Sonoma County, the channel stabilization works were constructed over a period of several years extending from 1956 through 1963.[233]

As stated above, under federal law local interests generally have maintenance responsibility for the works constructed by the Corps of Engineers. The Mendocino County Russian River Flood Control and Water. Conservation Improvement District is the local agency in Mendocino which has this responsibility. The Improvement District's maintenance work has consisted principally of channel clearing, although is has also replaced levees with financial assistance from the Public Law 99 disaster assistance program administered by the Corps of Engineers.[234]

A recent habitat survey conducted by Circuit Rider Productions, Inc. identified 3,502 linear feet of auto body bank protection, 2,511 feet of concrete, 570 feet of riprap, 500 feet of wood pilings, and 8,838 feet of jack lines along the Mendocino County reach of the Russian River. The survey of the Alexander Valley reach identified no auto bodies or concrete bank protection. It did, however, identify 7,430 linear feet of riprap, 2,440 feet of jacks and 1,130 feet of wood pilings.[235]

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[232]Robert Morrison, Sonoma County Water Agency, personal communication on April 22, 1996.

[233]U.S. Army Corps of Engineers, Russian River Channel Improvement, Mendocino County, Operation and Maintenance Manual, July 1965, 1, 2.

[234]Barbara Spazek, Mendocino County Russian River Flood Control and Water Conservation District, personal communication on April 22, 1996.

[235]Circuit Rider, Draft Riparian Habitat Report, 19, 20.

The Corps of Engineers erosion control projects on Dry Creek were constructed in conjunction with the Warm Springs Dam Project. The Dry Creek installations were made at 15 different locations. They were constructed under three different contracts completed in August 1981, July 1984 and October 1989.[236]

Three grouted riprap sills were constructed across Dry Creek approximately 10 miles downstream from Warm Springs Dam. Rock riprap protection was placed on the banks along Dry Creek at seven sites. Five of the sites were within the first two miles below the dam, and the other two sites were at the sills. The total length of the riprapped sections was 4,680 feet.[237]

Steel piles with timber planking were constructed at two sites. These were located 1.3 miles below the dam and 5.3 miles below the dam. The total length of these works was 1,600 feet. Also approximately 130 feet of derrick stone toe protection an a low rock weir structure were constructed four miles below the dam. Finally, grade control structures, concrete weirs, stilling basins and channel protection were constructed at the mouth of Vinces Creek, 2.5 miles below the dam, and Pena Creek, 3 miles below the dam.[238]

As in the case of the works constructed by the Corps of Engineers on the Russian River, the Agency is responsible for the maintenance and operation of the works on Dry Creek. Fish ladders were installed at the three sills to facilitate fish passage. The fish ladders are Denil type and are provided with a 3 foot resting pool at the downstream end. Each is protected against floating debris by steel pipe trashracks which must be cleaned regularly.[239]

In conjunction with the construction of its Potter Valley Project, Pacific Gas and Electric Company's (PG&E) predecessor constructed a discharge channel approximately 1.2 miles in length to connect the Potter Valley Powerhouse tailrace with Adobe Creek, a tributary to the East Fork Russian River. This channel

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[236]U.S. Army Corps of Engineers. Warm Springs Dam and Lake Sonoma Project, Russian River Basin, Dry Creek, Channel Improvements, Sonoma County, California, Operation and Maintenance Manual, July 1991, 3 through 5.

[237]Ibid., 4.

[238]Ibid., 5.

[239]Ibid., 11.

includes two grade stabilizing check dams.[240] A series of 18 grade stabilizing check dams were constructed in the East Fork Russian River extending downstream for several miles. Since 1965 the Sonoma County Water Agency has been responsible for the maintenance of these check dams and the river banks along this reach of the East Fork Russian River.[241]

FLOOD CONTROL ZONES

In 1958, under the authority of the Sonoma County Water Agency's enabling legislation, the formation of eight geographical zones, each encompassing a major watershed, was proposed as a means of financing the construction and maintenance of flood control works within Sonoma County. Over the succeeding several years six of the zones were formed, including Zone 1A and Zone 5A. Zone 1A encompasses the Mark West Creek-Laguna de Santa Rosa watershed. Zone 5A encompasses the Russian River from the mouth to Redwood Highway Bridge at Healdsburg, excluding Zone 1A.[242]

Since its formation, Zone 1A has financed the construction of flood control and drainage facilities, the clearing of natural waterways, the preparation of master drainage plans for areas subject to flooding, and erosion and sediment control activities. The zone has also financed the flood control operation and maintenance activities of the Agency, which include planting, pruning, spraying, fertilizing and irrigating channel landscaping; fencing; mowing to eliminate fire hazards; structural repair; grading and reshaping of channels; and spraying using herbicides approved by the County Agricultural Commissioner to control undesirable vegetation. [243]

In Mendocino County, the Mendocino County Water Agency has flood control powers similar to those of the Sonoma County Water

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[240]Pacific Gas and Electric Company. Potter Valley Project, FERC No. 77, License and Agreements, Exhibit K-6.

[241]Agreement between Pacific Gas and Electric Company and the Sonoma County Flood Control and Water Conservation District, dated July 31, 1965.

[242]Sonoma County Water Agency. A Report to the Board of Directors of the Sonoma County Water Agency on Benefit Assessments for Flood Control Purposes within Flood Control Zones 1A and 2A, July 1995, 1.

[243]Ibid., 5, 6.

Agency. No flood control zones of the type existing in Sonoma county have been formed in Mendocino County. However, local drainage projects have been constructed in the Russian River basin in both Mendocino County and Sonoma County by the cities and counties. The Mendocino County Russian River Flood Control and Water Conservation Improvement District was formed under the Mendocino County Water Agency's enabling legislation, however, its flood control activities are limited to its obligations relative to the Coyote Valley Dam Project.[244]

[244]Barbara Spazek, Mendocino County Russian River Flood Control and Water Conservation District, personal communication on April 22, 1996.

Chapter I, General Purpose Local Government

INTRODUCTION

In California, a city is a municipal corporation, created for public purposes. The state may create, expand, diminish or abolish cities subject only to the state's own laws and the California Constitution. A municipal corporation is a body politic and corporate possessing a legal entity and name. A municipal corporation has the capacity to contract and be contracted with, to sue and be sued, and to hold and dispose of property, and thereby to acquire rights and incur liabilities.[245]

Counties in California are expressly designated as political subdivisions of the state in the California Constitution and also in Section 23002 of the California Government Code. A major function of counties is to assist the state in administering state programs.[246]

Cities on the other hand, have not been designated as political subdivisions of the state by either the California Constitution or statute. Cities are created as an instrument of local self-government by the residents which inhabit cities. Article XI, section 2 of the California Constitution expressly requires the legislature to provide for city formation.[247]

Similarly, charter cities enjoy more autonomy than charter counties do. The constitutional provisions relating to charter counties contain no general reservation of local autonomy and no grant of plenary authority over local election matters and municipal affairs, as is the case for charter cities.[248]

The powers of cities and counties to regulate land use are prescribed by three laws which are discussed in following sections of this chapter. These are the Planning and Zoning Law, the California Environmental Quality Act, and the Surface Mining

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[245]League of California Cities. The California Municipal Law Handbook, 1994. I-1.

[246]Ibid.

[247]Ibid., I-2.

[248]Ibid.

and Reclamation Act of 1975. Under these laws, the powers of cities and counties are essentially the same, with cities exercising jurisdiction within their corporate boundaries, and counties exercising jurisdiction within the unincorporated area of the county.

CITIES

The Russian River basin includes eight incorporated cities. These are Ukiah, Cloverdale, Healdsburg, Windsor, Santa Rosa, Rohnert Park, Cotati and Sebastopol. Of these, only Santa Rosa is a charter city, with Ukiah, Cloverdale, Healdsburg, Windsor, Rohnert Park, Cotati and Sebastopol all being general law cities.

Cities receive their power from the California Constitution and/or applicable general laws. Cities may be organized either under a charter or under the general law. Any city may enact or revise a charter for its own government. Some state laws apply only to general law cities, while others apply to both general law and charter cities. The California Constitution grants charter cities the power to make and enforce all ordinances and regulations with respect to municipal affairs. Unless preempted by state legislation on matters of statewide concern, the laws of a charter city will prevail over inconsistent state laws.[249]

Article XI, Section 7 of the California constitution authorizes cities to exercise police power to make and enforce within its limits all local, police, sanitary and other ordinances and regulations not in conflict with general laws. The power of municipalities under this section is as broad as that of the state legislature, providing the power is exercised within the city and is not in conflict with the state's general laws. In the exercise of its police power, a city has broad discretion in determining what is reasonable in endeavoring to protect the public health, safety, morals, and general welfare of the community.[250]

The fact that the state, in the exercise of its police power, has enacted certain regulations does not, in itself, prohibit a municipality from imposing additional requirements. If no conflict exists between the two, the requirements of the municipal ordinance are not unreasonable or discriminatory, and the state has not preempted the field, both will stand. However, local legislation which conflicts with the general laws of the

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249Ibid., I-3.

[250]Ibid., I-4.

state is void. Conflict exists when an ordinance duplicates, contradicts, or enters into a field which is fully occupied, expressly or implicitly, by general law.[251] Charter cities are exempt from the Article XI, section 7 provision prohibiting a city from enacting local laws which conflict with general laws providing such local laws concern judicially declared municipal affairs.[252]

COUNTIES

There are 58 counties in California.[253] The Russian River basin includes two of these counties, Mendocino and Sonoma.

The powers of California counties are prescribed by the California constitution and Title 3 of the California Government Code, commencing at section 23000. A county is a body corporate and politic which has the powers specified in Title 3 and such others necessarily implied from those expressed.[254]

A county may sue and be sued; purchase, receive by gift or bequest, and hold land within its limits, or elsewhere when permitted by law; make contracts and purchase and hold personal property necessary to the exercise of its powers; manage, sell, lease, or otherwise dispose of its property as the interests of its inhabitants require; and levy and collect taxes authorized by law.[255]

Article XI, Section 7 of the California constitution authorizes counties to exercise police power to make and enforce within its limits all local, police, sanitary and other ordinances and regulations not in conflict with general laws.[256] Violation of a county ordinance is a misdemeanor unless by ordinance it is made an infraction. Such violation may be prosecuted by county authorities in the name of the people of the

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[251]Ibid., I-5.

[252]Ibid., I-10.

[253]West's Annotated California Codes. Government Code, Section 23012.

[254]California Government Code, Section 23003.

[255]California Government Code, Section 23004.

[256]California Constitution, Article 11, Section 7.

State of California, or redressed by civil action.[257] Ordinances enacted by counties are effective only in the unincorporated territory of the county.[258]

In 1953, the state legislature determined that unprecedented growth in the unincorporated areas of many counties of California had created the need for extended governmental services in these areas. In response, the legislature adopted the County Service Area Law. This law provides a vehicle for furnishing urban services within developed unincorporated areas of a county adequate to meet the needs of such areas and provides a means to pay for such services.[259]

The board of supervisors of a county may appropriate and expend money from the general fund of the county for the protection and reforestation of the watersheds of streams and rivers in the county.[260] The board may appropriate and expend money from the general fund or other appropriate funds of the county for the construction of works, improvements, levees, or check dams to prevent the overflow and flooding of streams and rivers in the county, and where reasonably necessary, outside the county.[261]

PLANNING AND ZONING LAW

The planning and zoning powers and duties of California cities and counties are prescribed in Title 7 of the California Government Code, commencing at section 65000. Title 7 is known and cited as the Planning and Zoning Law. In this law, the legislature declared that California's land is an exhaustible resource which is essential to the economy, environment and general well-being of the people of California. It is the policy of the state to protect this resource and to insure its preservation and use in ways which are economically and socially desirable.[262]

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[257]California Government Code, Section 23132.

[258]Stirling v. Board of Supervisors of County of Los Angeles, 121 Cal. Rptr. 435, 48 Cal. App. 3d 184.

[259]California Government Code, Section 25210.1.

[260]California Government Code, Section 25680.

[261]California Government Code, Section 25681.

[262]California Government Code, Section 65030.

The legislature found that decisions involving the future growth of the state should be guided by an effective planning process, including the local general plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related factors.[263]

The Office of Planning and Research in the Office of the Governor is the state agency responsible for developing state land use policies, coordinating planning of all state agencies, and assisting and monitoring local and regional planning. The Office of Planning and Research does not, however, have any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs.[264]

Under the Planning and Zoning Law, every city and county must have a general plan for its physical development. The plan must be comprehensive, long-term and up-to-date. All local land use decisions must be consistent with the general plan, with a limited exception for charter cities.[265]

Each city and county has a planning agency with the power to carry out the jurisdiction's land use responsibilities. That function may be exercised by the legislative body or may be delegated to a planning commission, other administrative body, a hearing officer or any combination of these entities. Typically there is a planning commission. The planning commission reviews matters related to planning and development. It holds public hearings regularly scheduled to consider land use matters such as zone changes, conditional use permits, variances and general plan amendments. The city or county's planning or community development department provides staff support to the commission.[266]

The general plan has seven mandatory elements. These are a land use element, circulation element, housing element, conservation element, open space element, noise element and safety element. The general plan may contain additional elements relating to the physical development of the community, such as a recreation element and historic preservation element. The mandatory elements of general plans most relevant to the

[263]California Government Code, Section 65030.1.

[264]California Government Code, Section 65035.

[265]Municipal Law Handbook. V-17.

[266]Ibid., V-17, V-18.

condition of the Russian River are the land use element, conservation element, and open space element.[267]

The land use element of the general plan must designate the proposed general distribution and intensity of land uses for housing, industry, business, open space, natural resources, public facilities, waste disposal sites and other categories of public and private uses. The land use element must include standards of population density and building intensity, and also must identify areas subject to flooding and parcels designated for timber production.[268]

The conservation element of the general plan must address the identification, conservation, development and use of natural resources. Natural resources includes water, forests, soils, waterways, wildlife and mineral deposits. The element may also consider such issues as flood control, water and air pollution, erosion, conversion of farmland, endangered species, and timing and impact of mining and logging activities. The portions of the conservation element addressing water issues must be developed in coordination with all local agencies which deal with water in the community.[269]

The open space element of the general plan must detail comprehensive and long-range plans and measures for preserving open space for natural resources, managing the production of resources, for outdoor recreation, and for public health and safety. The element must have an action program which includes the adoption of an open space zoning ordinance designating exclusive agricultural zones, large lot zones and special overlay requirement for hazardous areas. The open space element must also include goals and policies for preserving and managing open space and an inventory of all open space property, whether privately or publicly owned.[270]

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The environmental preservation powers and duties of California cities, counties and other public agencies are prescribed in Division 13 of the California Public Resources

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[267]Ibid., V-20.

[268]Ibid., V-21.

[269]Ibid., V-24.

[270]Ibid., V-24, V-25.

Code, commencing at section 21000. Division 13 is a comprehensive environmental preservation law, known as the California Environmental Quality Act (CEQA). In this act, the legislature declared that every citizen has a responsibility to contribute to the preservation and enhancement of the environment. The interrelationship of policies and practices in the management of natural resources and waste disposal requires systematic and concerted efforts by public and private interests to enhance environmental quality and to control environmental pollution.[271]

The legislature also declared that it is the policy of the state to take all actions necessary to protect, rehabilitate, and enhance the environmental quality of the state; to prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history; to ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions; and to require government agencies at all levels to develop standards and procedures necessary to protect environmental quality.[272]

The Secretary of the California Resources Agency has adopted comprehensive regulations governing the requirements of CEQA. Every local public agency, including each city and county, must adopt local procedures which will be used to evaluate proposed projects and administer the local agency's responsibilities under CEQA. The local guidelines must be consistent with CEQA and the state CEQA guidelines.[273]

The public agency which has the principal responsibility for carrying out or approving a proposed project is the "lead agency". A "project" is any activity proposed to be carried out by, or subject to the discretionary approval of, a public agency which has the potential to cause a direct or reasonably foreseeable indirect physical change in the environment. The lead agency prepares an environmental impact report (EIR) or negative declaration. An agency which has discretionary approval authority over a project, but which does not have principal responsibility for carrying out or approving the project, is a

[271]California Public Resources Code, Section 21000.

[272]California Public Resources Code, Section 21001.

[273]Municipal Law Handbook, VI-4.

"responsible agency". Although in some instances two or more agencies will act to implement or approve *a* project, only one agency can function as the lead agency. The state CEQA guidelines establish criteria for determining which agency is the lead agency. Cities and counties normally serve as the lead agency for private projects within their respective jurisdictions.[274]

A responsible agency does not prepare an environmental impact report or negative declaration. However, a responsible agency must consult with the lead agency regarding the EIR or negative declaration and consider that document before approving a project.[275]

A negative declaration is appropriate in two situations. First, a negative declaration is prepared if no substantial evidence shows the project may have a significant impact on the environment. Second, a negative declaration is prepared if an initial study identifies potentially significant impacts, but revisions made to the project before public review of the negative declaration clearly reduce the impacts to a level of insignificance. This latter type is known as a "mitigated" negative declaration.[276]

SURFACE MINING AND RECLAMATION ACT OF 1975

The powers and duties of California cities and counties with respect to surface mining and reclamation are prescribed in Division 2, Chapter 9 of the California Public Resources Code, commencing at Section 2710. Chapter 9 is known as the Surface Mining and Reclamation Act of 1975. In this act, the legislature found and declared that the extraction of minerals is essential to the continued well-being of the state and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety.[277]

The legislature declared its intent to create and maintain an effective and comprehensive surface mining and reclamation regulatory policy to assure that; (1) adverse environmental

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[274]Ibid., VI-4, VI-5.

[275]Ibid., VI-5.

[276]Ibid., VI-8.

[277]California Public Resources Code, Section 2711.

effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses; (2) the production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment; and (3) residual hazards to the public health and safety are eliminated.[276]

The Surface Mining and Reclamation Act of 1975 does not limit the police power of cities and counties, nor their power to declare, prohibit and abate nuisances. Nor does it limit the power of cities and counties to regulate land uses under the Planning and Zoning Law. Cities and counties may also adopt policies, standards, or regulations imposing additional requirements if such requirements do not prevent compliance with the provisions of the act.[277]

The act requires every city and county with an active surface mining activity within its jurisdiction to adopt ordinances in accordance with state policy which establish procedures for the review and approval of reclamation plans and the issuance of a permit to conduct surface mining operations.[278] These ordinances must be submitted to the state and certified by the state as being in accordance with state policy before they become effective.[279] Except for persons who have a vested right to conduct surface mining operations, once the local ordinance has been certified, no person may conduct surface mining operations, with certain limited exceptions, unless a permit is obtained from, and a reclamation plan has been submitted to, and approved by, and financial assurances for reclamation have been approved by, the city or county having jurisdiction.[280] If no local ordinance is effective, reclamation plans must be submitted to, and approved by, the state prior to any surface mining.[281]

A vested right to conduct surface mining is a right, protected by due process concerns, to continue the use existing at the time a land use law is passed, even though the law would

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[276]California Public Resources Code, Section 2712.

[277]California Public Resources Code, Section 2715.

[278]California Public Resources Code, Section 2774.

[279]California Public Resources Code, Sections 2774.3, 2774.5.

[280]California Public Resources Code, Section 2770.

[281]California Public Resources Code, Section 2774.5.

not otherwise allow such use.[282] The Surface Mining and Reclamation Act of 1975 became effective on January 1, 1976. Persons who have a vested right to conduct surface mining operations are not required to obtain a permit from either the city or county, or the state, as long as the mining continues and as long as no substantial changes are made in the operation. A person is deemed to have a vested right if, prior to January 1, 1976, the person has in good faith and in reliance upon any required permits diligently commenced surface mining operations and incurred substantial liabilities for necessary work and materials. Persons having vested rights must nevertheless submit a reclamation plan to the city or county having jurisdiction, and secure approval of the plan.[283]

The Surface Mining and Reclamation Act of 1975 contains complex provisions relating to continued mining under vested rights pending the approval of reclamation plans. It also provides for various time limits for submission of, and action on, reclamation plans, for appeals of local government decisions to the state, and for interim management plans.[284]

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[282]Hansen Bros. Enterprises v. Board of Supervisors of County of Nevada, 35 Cal.Rptr.2d 358, 30 Cal. App. 4th 23, 34 Cal. App. 4th 1546, review granted and opinion superseded 38

[283]California Public Resources Code, Section 2776.

[284]California Public Resources Code, Section 2770.

Chapter II, Special Districts

INTRODUCTION

The Russian River basin includes a large number of special districts. These include water districts, community services districts, an agricultural and open space district, public utility districts, recreation and park districts, resource conservation districts and sanitation districts. The basin also includes joint powers authorities.

Special districts are local governmental entities which focus on a limited field of activity, such as recreation or resource conservation. The power and duty of special districts is defined by enabling statutes and certain general laws.[285] This is in contrast to cities and counties, which have a state constitutional grant of police power which is as broad as that of the state legislature itself, so long as its exercise is not in conflict with the state's general laws.

In California, special districts are either dependent or independent. Dependent special districts are governed by either a city or county legislative body. Independent districts are governed by a separate board of directors.

The enabling statutes of special districts take two forms. Most special districts are formed under general enabling statutes which are codified as part of the general law of the state. Examples of these types of enabling statutes are the County Water District Act[286] and the Recreation and Park District Act[287]. The enabling statute of some special districts are unique to that district and are usually not codified. Examples of these special act districts are the Sonoma County Water Agency and the Mendocino County Water Agency, which are discussed in the following section.

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[285]Municipal Law Handbook, I-17.

[286]California Water Code, Division 12, commencing at Section 30000.

[287]California Public Resources Code, Division 5, Chapter 4, commencing at Section 5780.

SPECIAL ACT WATER AGENCIES

The Russian River basin includes two special act water agencies. These are the Sonoma County Water Agency and the Mendocino County Water Agency.

Sonoma County Water Agency

The Sonoma County Water Agency was created by the State Legislature (Statutes of 1949, Chapter 994 as amended). The Agency is empowered to produce and furnish surface and groundwater for beneficial uses; to control and dispose of flood, storm and other waters; to generate electrical energy; and to provide, operate and maintain recreation in connection with flood control and water conservation works within the jurisdiction of the Agency.[288]

Legislation enacted in 1994 added the collection, treatment and disposal of Wastewater to the Agency's responsibilities.[289] Under this legislation several county service areas providing Wastewater services were transferred to the Agency.

The Agency is a dependent district, governed by the Board of Supervisors of Sonoma County.[290] Many of the County of Sonoma officers are, ex officio, also officers of the Agency.[291] The territory of the Agency is all of Sonoma County.[292]

The Agency may adopt ordinances, resolutions, and take other legislative acts to carry out the purposes of the Agency so long as they are not in conflict with the State Constitution and the Agency's act. Unlike county ordinances, ordinances adopted by the Agency are effective in both the unincorporated and incorporated areas of Sonoma County, except within the territory of any city which formally requests to have its territory excluded.[293]

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[288]West's Annotated California Codes, Water Code Appendix, Chapter 53, Section 3.

[289]Ibid., Chapter 53, Sections 36 and 37.

[290]Ibid., Chapter 53, Section 4.

[291]Ibid., Chapter 53, Section 6.

[292]Ibid., Chapter 53, Section 1.

[293]Ibid., Chapter 53, Section 7.

Mendocino County Water Agency

The Mendocino County Water Agency was created by the State Legislature (Statutes of 1949, Chapter 995 as amended). The Agency is empowered to control flood and storm waters and other waters; to conserve such waters by storage in surface reservoirs; to divert and transport such waters for beneficial uses within the agency; to release such waters from surface reservoirs to replenish and augment the supply of waters in natural underground reservoirs and otherwise to reduce the waste of water and to protect life and property from floods within the agency; and to do any and every lawful act necessary to be done that sufficient water may be available for any present and future beneficial use of the lands or inhabitants within the agency.[294]

The Agency is a dependent district, governed by the Board of Supervisors of Mendocino County.[295] Many County of Mendocino officers are, ex officio, also officers of the Agency.[296] The territory of the Agency is all of Mendocino County.[297]

The Agency is authorized to establish improvement districts with all the powers of the Agency to undertake projects or works of improvement. The Mendocino County Russian River Flood Control and Water Conservation Improvement District, discussed in the following section, was formed under this authority.

WATER DISTRICTS

The Russian River basin includes ten water districts which rely on the Russian River for a water supply. These are the Mendocino County Russian River Flood Control and Water Conservation Improvement District, Potter Valley Irrigation District, Calpella County Water District, Redwood Valley County Water District, Willow County Water District, Millview County Water District, Forestville County Water District, Russian River County Water District, Sweetwater Springs Water District, and Windsor Water District.

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[294]Ibid., Chapter 54, Section 3.

[295]Ibid., Chapter 54, Section 4.

[296]Ibid., Chapter 54, Section 6.

[297]Ibid., Chapter 54, Section 1.

Mendocino County Russian River Flood Control and Water Conservation Improvement District

The Mendocino County Russian River Flood Control and Water Conservation Improvement District (Improvement District) was formed under the Mendocino County Water Agency Act.[298] The Improvement District, has with respect to the territory within its boundaries, the rights, duties, and powers of the Mendocino County Water Agency.[299]

The Improvement District is governed by an elected board of five trustees.[300] The territory of the Improvement District generally includes the Ukiah and Hopland Valleys. Redwood Valley is not included.

Potter Valley Irrigation District

The Potter Valley Irrigation District was formed under the Irrigation District Law.[301] The Potter Valley Irrigation District is an independent district, governed by an elected five-member board of directors.

Irrigation districts have substantial powers. They are authorized to provide water; under certain conditions to appoint water masters; reclaim Wastewater; provide for drainage; provide for the generation, transmission and distribution of electric power; provide flood control; with the consent of the electorate of the district, to provide sewage disposal; and to provide recreational facilities in connection with any dams, reservoirs, or other works owned or controlled by the district.[302]

County Water Districts

Calpella County Water District, Redwood Valley County Water District, Willow County Water District, Millview County Water District, Forestville County Water District, Russian River County Water District, Sweetwater Springs Water District and Windsor Water District were all formed under the County Water District

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[298]Ibid., Chapter 54, Sections 35 through 113.

[299]Ibid., Chapter 54, Section 102.

[300]Ibid., Chapter 54, Section 69.

[301]California Water Code, Division 11, commencing at Section 20500.

[302]California Water Code, Section 22075 through 22225.

Law.[303] The Windsor Water District is a dependent district, subsidiary to the Town of Windsor, and is governed by the Town Council of Windsor. The other districts are independent and are governed by elected five-member boards of directors.

County water districts are authorized to furnish sufficient water within the district for any present or future beneficial use; to store water for the benefit of the district, conserve water for future use, and appropriate, acquire, and conserve water and water rights for any useful purpose; and to operate water rights, works, property, rights, and privileges useful or necessary to convey, supply, store, or make use of water for any authorized purpose.[304] County water districts may sell surplus water to municipalities, public agencies, or consumers located outside the district.[305]

County water districts may hold, use, enjoy lease, or dispose of property within or outside the district necessary to the full exercise of its powers.[306] County water districts may construct, purchase, lease, or otherwise acquire works, water rights, land, rights, and privileges useful or necessary to convey, supply, store, or otherwise make use of water.[307]

County water districts may also acquire, construct, and operate facilities for the collection, treatment and disposal of sewage, waste and storm water of the district and its inhabitants, and of public agencies outside the district with the consent of such public agency.[308]

County water districts may use any water or land under their control for recreational purposes and in connection therewith may construct, maintain, and operate any works or facilities appropriate or ancillary to such recreational use.[309]

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[303]California Water Code, Division 12, commencing at Section 30000.

[304]California Water Code, Section 31020 through 31022.

[305]California Water Code, Section 31023.

[306]California Water Code, Section 31041.

[307]California Water Code, Section 31042.

[308]California Water Code, Section 31100.

[309]California Water Code, Section 31130.

COMMUNITY SERVICES DISTRICTS

The Russian River basin includes three community services districts which were formed under the Community Services District Law.[310] These are the Potter Valley Community Services District, Cazadero Community Services District and Occidental Community Services District. Community services districts are independent districts, governed by an elected board of directors consisting of either three or five members.

Community services districts are authorized to provide a broad range of municipal services. These include the supplying of water; collection, treatment and disposal of sewage, waste and storm water; collection or disposal of garbage or refuse; fire protection; public recreation; street lighting; mosquito abatement; police protection; library services; street maintenance; with the consent of the city or county, the construction and improvement of bridges, culverts, curbs, gutters and drains; undergrounding existing overhead utility lines; ambulance services; public airports and transportation services.[311]

AGRICULTURAL AND OPEN SPACE DISTRICTS

The Russian River basin includes one district which was formed under the Park and Open Space Districts Law.[312] The Sonoma County Agricultural Preservation and Open Space District was formed in 1990. The boundaries of the district encompass all of Sonoma County. It is a dependent district, governed by the Board of Supervisors of Sonoma County.[313]

The district is financed by the Sonoma County Open Space Authority through the levy of a ¼ percent countywide sales tax over a 20-year period. This provides the district approximately $10 million per year for the preservation of agricultural land

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[310]California Government Code, Title 6, Division 3, commencing at Section 61000.

[311]California Government Code, Section 61600.

[312]California Public Resources Code, Division 5, Chapter 3, Article 3, commencing at Section 5500.

[313]Sonoma County Agricultural Preservation and Open Space District, Acquisition Plan, November 1994, 1.

and open space.[314]

The acquisition of interests in agricultural lands and open space is made pursuant to an acquisition plan. This plan must be consistent with the County General Plan. The open space element of the Sonoma County General Plan establishes policies and programs to preserve the scenic and natural resources of the County. The land use, agricultural resources and resource conservation elements further include policies to protect agricultural lands and other sensitive areas.[315]

The preservation of agricultural land and open space by the district focuses on areas of the County which are designated in the open space element of the General Plan. These include community separators, scenic landscape units, scenic corridors, critical habitat areas, and riparian corridors.[316]

PUBLIC UTILITY DISTRICTS

The Russian River basin includes two public utility districts which were formed under the Public Utility District Act.[317] These are the Hopland Public Utility District and Cotati Public Utility District. The Hopland Public Utility District is an independent district governed by a five-member board of directors. The Cotati Public Utility District is a dependent district, subsidiary to the City of Cotati, and is governed by the Cotati City Council.

Public utility districts are authorized to provide a limited range of municipal services. These include supplying light, water, power, heat, transportation, telephone service and garbage and sewage disposal.[318] They also include providing fire protection, street lighting, public parks, public playgrounds, buildings to be used for public purposes, and works for the drainage of roads, streets and public places, including curbs,

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[314]Ibid.

[315]Ibid., 4, 5.

[316]Ibid.

[317]California Codes, Public Utilities Code, Division 7, commencing at Section 15501.

[318]California Public Utilities Code, Section 16461.

gutters, sidewalks and pavement of streets.[319]

RECREATION AND PARK DISTRICTS

The Russian River basin includes four recreation and park districts which were formed under the Recreation and Park District Law.[320] These are the Camp Meeker Recreation and Park District, Del Rio Woods Recreation and Park District, Monte Rio Recreation and Park District and Russian River Recreation and Park District. Recreation and park districts are governed by a five-member board of directors which may be either elected or appointed.[321] These four recreation and park districts are all independent districts, governed by elected directors.

Recreation and park districts are authorized to organize, promote, conduct, and advertise programs of community recreation; establish systems of recreation and recreation centers, including parks and parkways; acquire, construct, improve, maintain and operate recreation centers within or outside their territorial limits; and provide public transportation services.[322] Under certain conditions, recreation and park districts may also provide fire protection, garbage collection and disposal, street lighting, and street sweeping services.[323]

In addition to the powers enumerated above, in 1994 the Camp Meeker Recreation and Park District was granted the powers granted to county water districts by the County Water District Law.[324]

RESOURCE CONSERVATION DISTRICTS

The Russian River basin includes three resource conservation districts which were formed under the Resource Conservation

[319]California Public Utilities Code, Section 16463.

[320]California Public Resources Code, Division 5, Chapter 4.

[321]California Public Resources Code, Section 5781.4.

[322]California Public Resources Code, Section 5782.2.

[323]California Public Resources Code, Sections 5782.22, 5782.23.

[324]California Public Resources Code, Section 5782.27.

District Law.[325] These are the Mendocino County Resource Conservation District, Gold Ridge Resource Conservation District and Sotoyome-Santa Rosa Resource Conservation District. Resource conservation districts are independent districts, governed by an elected five-member board of directors.[326]

Resource conservation districts are formed for the control of runoff, the prevention or control of soil erosion, the development and distribution of water, and the improvement of land capabilities.[327] Resource conservation districts are authorized to conduct surveys, investigations, and research relating to the conservation of resources and needed preventive and control measures.[328]

Resource conservation districts are authorized to make improvements on public lands, with the cooperation of the agency administering such lands, and on private lands, with the consent of the owners, in furtherance of the prevention or control of soil erosion, water conservation and distribution, agricultural enhancement, wildlife enhancement, and erosion stabilization. Authorized measures include terraces, ditches, levees, dams and other structures and the planting of trees, shrubs, grasses and other vegetation.[329]

Each resource conservation district must develop a district-wide comprehensive plan which must include soil and water conservation, including the improvement of farm irrigation and land drainage, erosion control and flood prevention, and community watersheds within the district. Such plans must conform with city and county general plans.[330]

SANITATION DISTRICTS

The Russian River basin includes five sanitation districts

[325]California Public Resources Code, Division 9, Chapter 3, commencing at Section 9151.

[326]California Public Resources Code, Section 9182.

[327]California Public Resources Code, Section 9151.

[328]California Public Resources Code, Section 9402.

[329]California Public Resources Code, Section 9409.

[330]California Public Resources Code, Section 9413.

which were formed under the County Sanitation District Act.[331] These are the Ukiah Valley Sanitation District, Forestville County Sanitation District, Occidental County Sanitation District, Russian River County Sanitation District and South Park County Sanitation District. The Ukiah Valley Sanitation District is a dependent district, governed by an three-member board of directors consisting of two Mendocino County supervisors and one member of the Ukiah City Council. The four Sonoma County sanitation districts are dependent districts, governed by the Board of Supervisors of Sonoma County.

County sanitation districts are authorized to acquire or construct, maintain, and operate, within or outside the district, sewage collection, treatment and disposal works. County sanitation districts are also authorized, to acquire or construct, maintain, and operate refuse transfer or disposal facilities.[332]

JOINT POWERS AUTHORITIES

Under the Joint Exercise of Powers Act[333], two or more public agencies by agreement may jointly exercise any power common to the contracting agencies. It is not necessary that any power common to the agencies be exercisable by each such contracting agency with respect to the geographical area in which such power is to be jointly exercised.

The joint exercise of powers agreement may provide for the administration of the agreement by one or more of the parties to the agreement, by a separate commission or board constituted pursuant to the agreement, or by a person, firm or corporation, including a nonprofit corporation, designated by the agreement.[335] When the agreement is administered by a separate commission or board, the commission or board is often referred to as a joint powers authority.

Any agency, commission, or board provided for by a joint

[331]California Health and Safety Code, Division 5, Part 3, Chapter 3, commencing at Section 4700.

[332]California Health and Safety Code, Section 4741.

[333]California Government Code, Title 1, Division 7, Chapter 5, Articles 1 and 2, commencing at Section 6500.

[334]California Government Code, Section 6502.

[335]California Government Code, Section 6506.

exercise of powers agreement may issue revenue bonds to pay the cost and expenses of acquiring or constructing a project or conducting a program for many statutorily enumerated purposes.[336] Prior to issuing revenue bonds, the parties to the joint exercise of powers agreement must authorize the issuance by ordinances. Such ordinances are subject to the referendum provisions of Section 9142 of the Elections Code.[337]

Santa Rosa Subregional Sewerage System

The cities of Santa Rosa, Rohnert Park and Sebastopol and the South Park County Sanitation District have entered into a joint exercise of powers agreement providing for the construction, operation and maintenance, financing and use of the Santa Rosa Subregional Sewerage System.[338] The subregional sewerage system consists of interceptor sewers, pumping stations, sewage treatment plants, effluent pipelines, reservoirs, and land disposal facilities which serve the contracting agencies.[339]

The agreement provides that the City of Santa Rosa shall administer, construct, operate, manage and control the subregional sewerage system.[340] The agreement establishes a technical advisory committee comprised of the chief administrative officer of each party to the agreement or their designees. the purpose of the advisory committee is to present, review and resolve mutual problems related to the subregional sewage system; to recommend a uniform sewer use ordinance and to advise on its application; to recommend content of and to review operation and management reports; to review the annual budget, capacity assignment and planning; and to appoint and supervise an independent certified public accountant.[341]

Mendocino County Inland Water and Power Commission

A joint exercise of powers agreement is being negotiated between the Mendocino County Water Agency, Mendocino County

[336]California Government Code, Section 6546.

[337]California Government Code, Section 6547.

[338]Agreement between City of Santa Rosa and City of Rohnert, Park. City of Sebastopol. South Park Sanitation District for Use of Santa Rosa Subregional Sewerage System, April. 1975.

[339]Ibid., Section 4.

[340]Ibid., Section 5.

[341]Ibid., Section 6.

Russian River Flood Control and Water Conservation Improvement District, Redwood Valley County Water District, Potter Valley Irrigation District, and City of Ukiah which would establish the Mendocino County Inland Water and Power Commission.[342] The purpose of the agreement is to provide a means for the acquisition of water works, and power plant and related assets and rights; to preserve the continued Eel River diversions into the Russian River; to maintain the viability of the Pacific Gas and Electric Company's Potter Valley Project; to purchase or otherwise acquire the Potter Valley Project; and to negotiate and enter into agreements respecting Eel and Russian River waters.[343]

The proposed Commission would be governed by *a* board of directors consisting of one member appointed by and from the governing boards of each of the parties to the agreement. The board of directors would have the power to retain engineering and legal advisors and to appoint and employ officers and employees.[344]

[342]Draft #9, Joint Exercise of Powers Agreement for the Formulation and Implementation of the Mendocino County Inland Water and Power Commission (Commission), February. 1996.

[343]Ibid., Section 3.01.

[344]Ibid., Article V.

Chapter III, State Agencies

INTRODUCTION - THE RESOURCES AGENCY

The Resources Agency includes the several departments, boards and commissions of state government which are concerned with natural resources.[345] Departments which are in the Resources Agency include Parks and Recreation, Conservation, Forestry, Water Resources, and Fish and Game.[346]

Commissions which are in the Resources Agency include the State Park and Recreation Commission, State Resource Conservation Commission, California Water Commission, Fish and Game Commission, California Coastal Commission, and State Lands Commission. Boards in the Resources Agency include the State Mining and Geology Board, State Board of Forestry, Wildlife Conservation Board, and State Water Resources Control Board. The State Coastal Conservancy is also in the Resources Agency.

The Resources Agency is headed by a secretary who is appointed by and directly responsible to the Governor.[347]

DEPARTMENT OF PARKS AND RECREATION

The executive officer of the Department of Parks and Recreation is the Director of Parks and Recreation who is appointed by the Governor.[348] The principal responsibility of the Department of Parks and Recreation is the operation and maintenance of the state park system. State park facilities within or partly within the Russian River basin include the Armstrong Redwoods State Reserve, Austin Creek State Recreation Area, Annadel State Park and Sugarloaf Ridge State Park.

Additional powers and duties of the Department include the conducting of studies and surveys of existing recreational facilities and services within the state; the development of long range plans for recreational facilities and programs necessary to meet recreational needs throughout the state; and participation

[345]California Government Code, Section 12801.

[346]California Government Code, Section 12805.

[347]California Government Code, Section 12850.

[348]California Public Resources Code, Section 501.

with other federal, state, and local governmental agencies in planning and coordinating the development of recreational facilities and programs.[349]

State Park and Recreation Commission

The State Park and Recreation Commission consists of nine members appointed by the Governor for four year terms.[350] The Commission establishes general policies for the guidance of the Director of Parks and Recreation in the administration, protection, and development of the state park system.[351] In addition, the Commission must formulate, in cooperation with other state agencies, interested organizations and citizens, and recommend to the Director, a comprehensive recreational policy for the state.[352]

DEPARTMENT OF CONSERVATION

The executive officer of the Department of Conservation is the Director of Conservation, who is appointed by the Governor.[353] The Department of Conservation consists of four divisions, known as the Division of Mines and Geology; the Division of Oil, Gas, and Geothermal Resources; the Division of Resource Conservation; and the Division of Recycling.[354]

Division of Mines and Geology

The executive officer of the Division of Mines and Geology is the Director of Conservation.[355] The Director is advised by the State Geologist.[356] The responsibilities of the Division includes the maintenance of the California State Mining and Mineral Museum; carrying out programs, in cooperation with other

[349]California Public Resources Code, Section 541.

[350]California Public Resources Code, Section 530.

[351]California Public Resources Code, Section 539.

[352]California Public Resources Code, Section 540.

[353]California Public Resources Code, Section 601.

[354]California Public Resources Code, Section 607.

[355]California Public Resources Code, Section 2202.

[356]California Public Resources Code, Section 2205.

governmental agencies, to reduce the loss of life and property by mitigating geological hazards; collecting statistics concerning the occurrence and production of the economically important minerals and the methods pursued in making their valuable constituents available for commercial use; and administering the Surface Mining and Reclamation Act of 1975.[357]

State Mining and Geology Board

The State Mining and Geology Board consists of nine members appointed by the Governor for four year terms.[358] The Board nominates, and the Director appoints the State Geologist.[359] The Board represents the state's interest in the development, utilization, and conservation of the mineral resources of the state and establishes surface mining and reclamation policy.[360]

The State Mining and Geology Board provides for a statewide program of research regarding the technical phases of reclaiming mined lands.[361] The Board also provides for a public information program on matters involving the state's terrain, mineral resources, mining, the reclamation of mined lands, and the seismological and geological aspects of earthquakes and other geological hazards.[362]

Division of Resource Conservation

The executive officer of the Division of Resource Conservation is the Chief of the Division of Resource Conservation.[363] The Division of Resource Conservation assists in the formation, organization, and operation of the resource conservation districts discussed in Chapter 2 of this Part.[364] The division may review resource conservation plans and proposals presented by resource conservation districts and approve,

[357]California Public Resources Code, Division 2.

[358]California Public Resources Code, Section 660 and 664.

[359]California Public Resources Code, Section 677.

[360]California Public Resources Code, Section 672.

[361]California Public Resources Code, Section 675.

[362]California Public Resources Code, Section 676.

[363]California Public Resources Code, Section 9020.

[364]California Public Resources Code, Section 9062.

disapprove, or suggest modifications of such plans.[365]

State Resource Conservation Commission

The State Resource Conservation Commission consists of nine members appointed by the Governor for four year terms.[366] The Commission formulates, in cooperation with other state agencies, interested organizations, and citizens, a comprehensive resource conservation policy for the state.[367] The Commission makes grants to resource conservation districts to assist the districts in carrying out their responsibilities, including small watershed flood control projects and other works the districts are authorized to undertake.[368] With the approval of the State Resource Conservation Commission, the Division may provide technical assistance to resource conservation districts to aid cooperators in carrying out conservation practices and to aid districts in developing plans for achieving their soil and water conservation objectives.

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

The executive officer of the Department of Forestry and Fire Protection is the Director of Forestry and Fire Protection, who is appointed by the Governor.[370] The Department of Forestry and Fire Protection is most widely known for its fire prevention and suppression activities. In carrying out its primary mission of Wildland fire protection, the Department has established and maintains fire stations throughout the state.[371] The Department also administers the Forest Practice Act, manages the state forests, maintains state nurseries to support the reforestation of public and private lands, enters into cooperative agreements for the control and eradication of insect pests or plant diseases damaging or threatening forests, and acquires and preserves land

[365]California Public Resources Code, Section 9063.

[366]California Public Resources Code, Section 9101.

[367]California Public Resources Code, Section 9108.

[368]California Public Resources Code, Section 9111.

[369]California Public Resources Code, Section 9064.

[370]California Public Resources Code, Section 701.

[371]California Public Resources Code, Section 4143.

containing Sequoia Gigantea.[372]

State Board of Forestry

The State Board of Forestry consists of nine members appointed by the Governor for four year terms.[373] The Board represents the state's interest in the acquisition and management of the state forests and the protection of the state's interest in forest resources on private land. The Board establishes forest policy and the general policies for guidance of the Department of Forestry and Fire Protection.[374]

The Board provides for a statewide program of research in the technical phases of forest, management.[375] Other state agencies must submit to the Board plans for, and the results of, all investigations that relate to, or have an effect on, forest resource utilization for review and comment.[376] The Board must implement a public information program on matters involving forest management and maintain an information file on forest management research.[377]

The Board provides for the registration of professional foresters utilizing a five-member examination committee composed of either members of the Board, professional foresters, or any combination of the two.[378] The Board also classifies all land with the state for the purpose of determining areas in which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the state.[379]

Forest Practice Act

The principal land use management powers and duties of the Department of Forestry and Fire Protection is prescribed in Division 4, Part 2, Chapter 8 of the California Public Resources

[372]California Public Resources Code, Division 4.

[373]California Public Resources Code, Sections 730, 732.

[374]California Public Resources Code, Section 740.

[375]California Public Resources Code, Section 742.

[376]California Public Resources Code, Section 743.

[377]California Public Resources Code, Section 745.

[378]California Public Resources Code, Section 763.

[379]California Public Resources Code, Section 4125.

Code. Chapter 8 is known as the Z'Berg-Nejedly Forest Practice Act of 1973. In this act the legislature declared that the forest resources and timberlands of the state furnish high-quality timber, recreational opportunities, and aesthetic enjoyment while providing watershed protection and maintaining fisheries and wildlife, and that there is great concern relating to their utilization, restoration, and protection. The legislature further declared that it is the policy of the state to encourage prudent and responsible forest resource management to both meet the need for timber and other forest products, and give consideration to water protection, fisheries and wildlife, and recreational opportunities.[380]

The intent of the legislature in adopting the Forest Practice Act was to create, and maintain an effective and comprehensive system of regulation and use of all timberlands to assure that where feasible, the productivity of timberland is restored, enhanced and maintained, and the goal of maximum sustained production of high-quality timber products is achieved while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, and aesthetic enjoyment.[381]

The Act does not preclude local police regulation of forest fire prevention and protection, provided such regulation is not in conflict with state law. The Forest Practice Act does preempt the regulation of general forest practices by local governmental agencies having land use regulatory powers.[382] However, the act provides that individual counties may request the State Board of Forestry to adopt additional rules and regulations for the content of timber harvesting plans and the conduct of timber operations to take into account local needs.[383]

The Forest Practice Act and the California Environmental Quality Act are not in conflict. Timber companies submitting timber harvesting plans pursuant to the Forest Practice Act must also comply with the Environmental Quality Act.[384]

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[380]California Public Resources Code, Section 4512.

[381]California Public Resources Code, Section 4513.

[382]28 Ops.Atty.Gen. 190, 10-10-56.

[383]California Public Resources Code, Section 4516.5.

[384]Natural Resources Defense Council, Inc. v. Arcata Nat. Corp. (1976) 131 Cal.Rptr. 172, 59 C.A.3d 959.

Under the Forest Practice Act the State Board of Forestry must adopt forest practice rules and regulations for each of the districts into which the state is divided. The rules and regulations must assure the continuous growing and harvesting of commercial forest tree species and protect the soil, air, fish, and wildlife, and water resources, including, but not limited to, streams, lakes, and estuaries.[385]

Under the Forest Practice Act no person can conduct timber operations unless a timber harvesting plan, prepared by a registered professional forester, has been submitted to the Department of Forestry and Fire Protection.[386] Upon receipt, timber harvesting plans are filed in the county in which timber operations are proposed for public inspection and comment. Copies are transmitted to the Department of Fish and Game, the Regional Water Quality Control Board having jurisdiction, and the county planning agency.[387]

The Forest Practice Act includes extensive provisions providing for review of submitted timber harvesting plans, public comments, time limits, appeals, hearings and a determination by the Director of Forestry and Fire Protection, and if appealed, the State Board of Forestry.[388]

DEPARTMENT OF WATER RESOURCES

The executive officer of the Department of Water Resources is the Director of Water Resources, who is appointed by the Governor.[389] The Department of Water Resources is most widely known for its construction and operation of the California Water Project. However, the Department has many other powers and duties and is involved in many activities, some of which directly affect the Russian River basin.

The Department is authorized to make investigations relative to water resources; to supervise the distribution of water in accordance with agreements and court orders; investigate and report on available reservoir sites; make seasonal water supply

[385]California Public Resources Code, Section 4551.

[386]California Public Resources Code, Section 4581.

[387]California Public Resources Code, Section 4582.6.

[388]California Public Resources Code, Sections 4582.7, 4582.9.

[389]California Water Code, Section 120.

reports; take actions to prevent the unreasonable use of water; and regulate artificial rainmaking. The Department is authorized to establish and administer watermaster service areas; regulate and supervise dams and reservoirs; and engage in various flood control, and land reclamation and drainage studies and projects.[390]

The Department provides financial assistance for local projects pursuant to the Davis-Grunsky Act. This act provides for grants and loans by the State to public agencies for the construction of water projects to meet local requirements for which there is a statewide interest.[391]

California Water Commission

The California Water Commission consists of nine members appointed by the Governor for four year terms. The Commission confers with, advises and makes recommendations to the Director of Water Resources with respect to any matter under his jurisdiction; approves rules and regulations of the Department of Water Resources; holds hearings and conducts investigations; and reviews and reports annually to the State Legislature on progress of construction and operation of the California Water Project.[392]

All loans and grants made by the Department of Water Resources to local agencies pursuant to the Davis-Grunsky Act must be approved by the Commission.[393]

Division of Supervision of Safety of Dams

The State Legislature has preempted the field of regulation of the safety of dams.[394] Dams subject to state jurisdiction are those which are either more than 25 feet high, or impound more than 50 acre-feet of water.[395] The Department of Water Resources is charged with the supervision of safety of dams.[396] This is

[390]Water Law in Perspective. West's Annotated California Codes, Water Code, LXXXV-XCII.

[391]California Water Code, Sections 12880 through 12893.

[392]Water Law in Perspective, XCVII.

[393]Ibid.

[394]California Water Code, Section 6025.

[395]California Water Code, Section 6002.

[396]California Water Code, Section 6075.

carried out by its Division of Supervision of Safety of Dams.

The construction or enlargement of any dam or reservoir requires the prior written approval of the Department.[397] The repair, alteration, or removal of *a* dam or reservoir also requires the prior written approval of the Department.[398]

STATE WATER RESOURCES CONTROL BOARD

The State Water Resources Control Board consists of five members appointed by the Governor for four year terms. The Board is divided into two. statutory divisions, the Division of Water Rights and the Division of Water Quality. The Board employs its own legal counsel.[399]

Responsibilities of the State Water Resources Control Board include the issuance of permits for the appropriation of water upon such terms as in its judgment will best develop, conserve and utilize the water or are necessary to carry out water quality control plans; issuance of appropriative water right licenses; and upon petition, the adjudication of all rights to the water of a stream system. The Board is also responsible for establishing state policy and objectives for water quality control; administering water quality research programs; acting as the state water quality control agency under the Federal water quality statutes, reviewing and approving applications for federal grants and certifying priority of projects for federal grants; and administering state loans to local agencies for water quality control facilities. Upon petition, or on its own initiative, the Board may review actions or the failure to act by regional water quality control boards, and may exercise the power of regional boards with respect to the issuance of waste discharge requirements, cease and desist orders and associated actions.[400]

North Coast Regional Water Quality Control Board

California is divided into nine regions. Each region has a water quality control board composed of nine members appointed by the governor for four year terms. The Russian River basin is

[397]California Water Code, Section 6200.

[398]California Water Code, Section 6225.

[399]Water Law in Perspective, XCVII.

[400]Ibid., XCIV, XCV.

located in the North Coast Region.[401]

The regional boards have the responsibility to formulate and adopt water quality control plans for all areas in the regions. The plan must conform to state policies and designate the beneficial uses of water to be protected, water quality objectives, and a program for achieving the objectives. Regional plans are not effective until approved by the State Board.[402]

The regional boards are responsible for establishing requirements for individual waste dischargers. Waste dischargers, except those discharging into a community sewer system, must file a report with the regional board. Any material changes in waste discharges must also be reported. The regional board's requirements cannot specify the design, location, type of construction or particular manner in which compliance may be had.[403]

If waste discharge requirements are violated, the regional board may issue cease and desist orders requiring compliance immediately or in accordance with a time schedule. These orders are enforceable by court injunctions and civil penalties. The regional board may require violators to clean up and abate the effects of waste discharges or have the work done at the violator's expense. The regional board may also limit the volume, type, or concentration of waste discharged to a community sewer system.[404]

DEPARTMENT OF FISH AND GAME

The executive officer of the Department of Fish and Game is the Director of Fish and Game who is appointed by the Governor.[405] One of the principal responsibilities of the Department of Fish and Game is to administer and enforce the Fish and Game Code.[406] Employees appointed by the Director to enforce the Fish and Game Code are peace officers, with all the powers and authorities

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[401]Ibid., XCV.

[402]Ibid., XCV.

[403]Ibid.

[404]Ibid., XCVI.

[405]California Fish and Game Code, Sections 700, 701.

[406]California Fish and Game Code, Section 702.

conferred by law upon peace officers.[407] The Department is also responsible for species preservation through the operation of fish hatcheries and the management of fish, game, waterfowl, quail, and marine life refuges and other protected areas.[408]

Fish and Game Commission

The Fish and Game Commission consists of five members appointed by the Governor for six year terms.[409] The Commission establishes regulations for the noncommercial taking or possession of birds, mammals, fish, amphibia, and reptiles.[410] The Commission also establishes commercial fishing regulations.[411] The Commission formulates general policies for the conduct of the Department of Fish and Game[412]

Wildlife Conservation Board

The Wildlife Conservation Board consists of the president of the Fish and Game Commission, the Director of Fish and Game, and the Director of Finance.[413] The Board investigates and determines what areas within California are suitable for wildlife production and preservation; for game propagation, game refuges, waterfoul refuges, game farms, fish hatcheries, game management area; and what streams and lakes are suitable, or can be made suitable for fishing, hunting and shooting.[414] The Board also ascertains what lands are suitable for providing cover for the propogation and rearing in a wild state of waterfowl, shore birds, and upland birds.[415]

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[407]California Fish and Game Code, Section 851.

[408]California Fish and Game Code, Division 2 and Division 7, commencing at Sections 700 and 10500 respectively.

[409]California Constitution, Article IV, Section 20.

[410]California Fish and Game Code, Section 200.

[411]California Fish and Game Code, Division 6, Part 3, commencing at Section 7600.

[412]California Fish and Game Code, Section 703.

413California Fish and Game Code, Section 1320.

[414]California Fish and Game Code, Section 1345.

415California Fish and Game Code, Section 1346.

The Board is responsible for authorizing the acquisition of such lands and the construction of facilities suitable for the purposes for which the lands are acquired.[416] The Wildlife Restoration Fund, established by Section 19632 of the Business and Professions Code, is available for the acquisition and construction. Federal money made available for these projects is deposited into this fund.[417]

Stream Alteration Agreements

One of the principal regulatory tools available to the Department of Fish and Game is the stream alteration agreement process prescribed in Division 2, Chapter 6 of the California Fish and Game Code, commencing at Section 1600. In enacting this chapter, the legislature declared that, fish and wildlife are the property of the people and provide a major contribution to the economy of the state as well as providing a significant part of the people's food supply. For these reasons their conservation is a proper responsibility of the state and this chapter is enacted to provide such conservation for these resources.[418]

The stream alteration agreement process is described in two sections of the code. Section 1601 is applicable to state or local governmental agency and public utility projects which will divert, obstruct or change the natural flow or bed, channel or bank of any river, stream or lake designated by the Department of Fish and Game in which there is a fish or wildlife resource, or from which these resources derive benefit. Plans for such projects must be submitted to the Department. When an existing fish or wildlife resource may be substantially adversely affected, the Department must propose reasonable modifications to the project to protect the fish and wildlife resource. In the event the proposed modifications are not acceptable, an arbitration procedure is provided to resolve the issue.[419] Section 1603 includes similar provisions which are applicable to all persons undertaking such projects.

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[416]California Fish and Game Code, Sections 1348, 1350.

[417]California Fish and Game Code, Section 1352.

[418]California Fish and Game Code, Section 1600.

[419]California Fish and Game Code, Section 1601.

STATE LANDS COMMISSION

The State Lands Commission consists of the Controller, the Lieutenant Governor, and the Director of Finance.[420] The State Lands Commission is authorized to classify state-owned land for its different possible uses.[421] The Commission may make surveys and subdivisions of lands belonging to the state to be sold or leased.[422] The Commission represents the state in all contests between the state and the federal government in relation to public land.[423]

The State Lands Commission has exclusive jurisdiction over all ungranted tidelands and submerged lands owned by the state, and of the beds of navigable rivers, streams, lakes, bays, estuaries, inlets, and straits, including tidelands and submerged lands. The Commission administers and controls all such lands, and may lease or sell such lands upon terms determined by the Commission.[424]

CALIFORNIA COASTAL COMMISSION

The California Coastal Commission consists of sixteen members. The membership includes the Secretary of the Resources Agency, the Secretary of the Business and Transportation Agency, the Secretary of Trade and Commerce, the Chairperson of the State Lands Commission, six representatives of the public from the state at large, and six members selected from six coastal regions.[425]

The Commission has the primary responsibility for the administration of the California Coastal Act and the Federal Coastal Zone Management Act of 1972.[426] The Commission is the successor in interest to all the obligations, powers, duties and

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[420]California Public Resources Code, Section 6101.

[421]California Public Resources Code, Section 6201.

[422]California Public Resources Code, Section 6202.

[423]California Public Resources Code, Section 6210.

[424]California Public Resources Code, Section 6301.

[425]Public Resources Code, Section 30300.

[426]California Public Resources Code, Section 30330.

responsibilities of the California Coastal Zone Conservation Commission and the six regional coastal zone conservation commissions established by the California Coastal Zone Conservation Act of 1972.[427] Coastal development permits are required from the Commission for any of the following projects:[428]

- Developments between the sea and the first public road paralleling the sea or within 300 feet of the inland extent of any beach or of the mean high tide line of the sea where there is no beach, whichever is the greater distance.

- Developments located on tidelands, submerged lands, public trust lands, within 100 feet of any wetland, estuary, stream, or within 300 feet of the top of the seaward face of any coastal bluff.

- Any development which constutes a major public works project or a major energy facility.

STATE COASTAL CONSERVANCY

The State Coastal Conservancy consists of seven members. These include the Secretary of the Resources Agency, the chairperson of the Conservancy appointed by the Secretary of the Resources Agency, the Director of Finance, and four public members, two of which are appointed by the Governor, one by the Senate Committee on Rules, and one by the Speaker of the Assembly. The term of the public members and secretary of the commission is four years.[429] The State Coastal Conservancy is responsible for implementing a program of agricultural protection, area restoration, and resource enhancement in the coastal zone of the state.[430]

The Conservancy is authorized to acquire fee title, development rights, easements, or other interests in land located in the coastal zone to preserve agricultural land. The Conservancy may also undertake improvements and development of such land. The Conservancy must ultimately return such land to

[427]California Public Resources Code, Section 30331.

[428]California Public Resources Code, Section 30601.

[429]California Public Resources Code, Section 31100.

[430]California Public Resources Code, Section 31054.

private use or ownership with appropriate restrictions.[431]

The Conservancy is authorized to award grants to local public agencies and nonprofit organizations for the purpose of restoring areas of the coastal zone which are adversely affecting the coastal environment, or are impeding orderly development. After redesign and installation of public improvements, coastal restoration project lands, except land acquired for public purposes, must be conveyed for development in accordance with a restoration plan.[432]

The Conservancy is authorized to award grants to state agencies, local public agencies, and nonprofit organizations to enhance coastal resources which have suffered loss of natural and scenic values. Such grants must be used for the assembly of parcels of land to enhance the natural and scenic character of the areas.[433]

The Conservancy is authorized to acquire and hold key coastal resource lands which otherwise would be lost to public use.[434] The Conservancy is also authorized to award grants to any public agency or nonprofit organization which is a public land trust to acquire interests in, and for initial development of, lands to be used for public accessways to and along the coast, provided the accessway will serve more than local public needs.[435]

[431]California Public Resources Code, Section 31150.

[432]California Public Resources Code, Section 31200.

[433]California Public Resources Code, Section 31251.

[434]California Public Resources Code, Section 31350.

[435]California Public Resources Code, Section 31400.1.

Chapter IV, Federal Agencies

INTRODUCTION

A number of federal agencies have regulatory authority over activities which can affect the condition of the Russian River and its tributaries. Federal agencies also carry out research and collect and maintain scientific data. Many federal agencies also administer grant and loan programs, usually through state or local agencies, to further their purposes. The number of federal agencies and the programs that they administer are vast, and a detailed or complete description of them is beyond the scope of this study. This chapter identifies some of the federal agencies and programs which have an important roll in the Russian River basin.

U.S. ARMY CORPS OF ENGINEERS

The U.S. Army Corps of Engineers is an agency of the U.S. Department of Defense. The Corps of Engineers regulates activities in waters of the United States under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The Corps of Engineers has been involved in regulating certain activities in the nation's water since 1890. Until 1968, the primary thrust of the Corps' regulatory program was the protection of navigation. As a result of several new laws and judicial decisions, the program evolved to one that considers the full public interest by balancing the favorable impacts against the detrimental impacts.[436]

Section 10 of the Rivers and Harbors Act of 1899 requires approval prior to the accomplishment of any work in or over navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Typical activities requiring Section 10 permits are the construction of piers, wharves, bulkheads, dolphins, marinas, ramps, floats intake structures, and cable or pipeline crossings.437

Section 404 of the Clean Water Act requires approval prior to discharging dredged or fill material into the waters of the United States. Typical activities requiring Section 404 permits

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[436]Web at http://wetland.usace.mil/rpp-bro.html, July 1996.

[437]Ibid.

are:[438]

- o Depositing of fill or dredged material in waters of the U.S. or adjacent wetlands.
- o Site development fill for residential, commercial, or recreational developments.
- o Construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs.
- o Placement of riprap and road fills.

Any person, firm, or agency (including federal, state, and local government agencies) planning to work in navigable waters of the United States, or dump or place dredged or fill material in waters of the United States, must first obtain a permit from the Corps of Engineers. Waters of the United States includes essentially all surface waters such as all navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters.[439]

"Wetlands" are areas characterized by growth of wetland vegetation (bulrush, cattails, rushes, sedges, willows, pickleweed, and iodine bush) where the soil is saturated during a portion of the growing season or the surface is flooded during some part of most years. Wetlands generally include swamps, marshes, bogs, and similar areas.[440]

Individual permits are issued following a full public interest review of an individual application for a Department of the Army permit. A public notice is distributed to all known interested persons. After evaluating all comments and information received, final decision on the application is made. The permit decision is generally based on" the outcome of a public interest balancing process where the benefits of the project are balanced against the detriments.[441]

A nationwide permit is a form of general permit which authorizes a category of activities throughout the nation. These permits are valid only if the conditions applicable to the

[438]Ibid.

[439]Ibid.

[440]Ibid.

[441]Ibid.

permits are met. If the conditions cannot be met, a regional or individual permit *is* required.[442]

Regional permits are issued by the District Engineer for a general category of activities when 1) the activities are similar in nature and cause minimal environmental impact (both individually and cumulatively), and 2) the regional permit reduces duplication of regulatory control by State and Federal agencies.[443]

NATIONAL MARINE FISHERIES SERVICE

The National Marine Fisheries Service (NMFS) is a component of the National Oceanic and Atmospheric Administration which is the largest agency of the U.S. Department of Commerce. Although NMFS has traditionally focused on managing commercial fisheries, NMFS is increasing its efforts in the areas of ecosystem-based management and habitat conservation.[444]

NMFS has five regional offices. the Southwest Region primarily supervises California fisheries, but also has management responsibility for fisheries in Hawaii, the Pacific Trust Territories, Arizona and Nevada. California fisheries managed by the Southwest Region include salmon and steelhead trout. The Southwest Region is also actively involved in protected species issues, marine mammal issues, and habitat conservation issues.[445]

The NMFS has primary federal responsibility for the conservation, management, and development of living marine resources and for the protection of certain marine mammals and endangered species under numerous federal laws. NMFS is concerned about the habitats that support living marine resources since the well-being of these resources and the fishing industry

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[442]Ibid.

[443]Ibid.

[444]National Marine Fisheries Service. Overview of NMFS Activities in California: A Brief Summary, (Undated material circa 1990 submitted to the California Secretary for Environmental Affairs as part of the California Ocean Resources Management Program), 1.

[445]Ibid., 5.

depends upon healthy and productive habitats.[446]

NMFS has the primary federal responsibility for maintaining the health and productivity of the nation's marine fish and shellfish resources, but not the sole authority. From the coastline to three miles offshore, management responsibility rests with individual state governments. From 3 to 100 miles offshore, the bounds of the U.S. Exclusive Economic Zone, NMFS has sole authority.[447]

Although Exclusive Economic Zone resources are managed by NMFS, the management strategies are developed as fishery management plans. These are prepared by regional councils comprised of state and federal officials, and private citizens, including representatives from both the commercial and recreational fishing industry.[448]

The authority of NMFS to protect coastal and ocean habitats is limited. Although federal law calls for NMFS to review human activities affecting marine resources and to determine their impact, except in the case of protected species under the Endangered Species Act and marine mammals protected under the Marine Mammal Protection Act, NMFS has no authority to disapprove a project. NMFS also has to balance commercial and recreational interests when ruling on marine mammal and fishing conflicts.[449]

The NMFS has responsibility under the Endangered Species Act and the Marine Mammal Protection Act for certain endangered and threatened species which reside in the marine environment. NMFS also advises the Corps of Engineers on Section 10 and Section 404 permits.[450]

U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (USFWS) is an agency of the U.S. Department of the Interior. The USFWS has responsibility under the Endangered Species Act and the Marine Mammal Protection Act for the species not under NMFS

[446]Ibid., 1.

[447]Ibid.

[448]Ibid., 2.

[449]Ibid.

[450]Ibid., 2, 3.

jurisdiction. The USFWS also advises the Corps of Engineers on Section 10 and Section 404 permits.[451]

The mission of the USFWS is to conserve, protect, and enhance fish and wildlife and their habitats. The major responsibilities of the USFWS are migratory birds, endangered species, certain marine mammals, freshwater and anadromous fish, the National Wildlife Refuge System, wetlands, conserving habitat, and environmental contaminants.[452]

The USFWS *is* divided into seven geographic areas with headquarters located in Arlington, Virginia. Regional Offices are involved in regional and local activities while headquarters offices are involved in nationwide activities.[453]

In addition to its regulatory responsibilities, the USFWS administers the Sport Fish Restoration Act. This program borrowed its financing concept from the Federal Aid in Wildlife Restoration Act, or "Pittman-Robertson Act" as it is more commonly known, which has been supporting wildlife restoration since 1937. Both these programs employ an excise tax on the sale of angling and hunting equipment.[454]

Under the Sport Fish Restoration Act the excise tax proceeds are transferred to the USFWS for distribution among the states. Each state's share is based 60 percent on its licensed sport fishermen and 40 percent on its land and water area. No state may receive more than five percent or less than one percent.[455]

The Act provides funds to the states to build or reclaim fishing and boating access sites; to purchase fishing access areas, boat landings, piers, and fish production sites; to improve aquatic habitats; and to fund research and inventory projects. Up to 75 percent of the cost of restoration projects are borne by the federal excise tax funds and the balance by matching state funds, mainly derived from the sale of state sport

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[451]Web at http://www.fws.gov, July 1996.

[452]Ibid.

[453]Ibid.

[454]U.S. Fish and Wildlife Service, Federal Aid Restoring America's Sport Fisheries, Web at http://www.fws.aov/what/restfish.html, May 1996.

[455]Ibid.

fishing licenses.[456]

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is an independent agency within the executive branch of the federal government. It was created to permit coordinated and effective governmental action on behalf of the environment. The EPA has ten regional offices. The regional offices are headed by regional administrators who are responsible for accomplishing, within their regions, the national program objectives established by the agency.[457]

The U.S. Environmental Protection Agency (EPA) is responsible for implementing programs to protect the public and the environment by preventing, reducing and regulating contamination of surface and ground water. A watershed approach is used to provide protection for public health and water resources including lakes, rivers, estuaries, oceans and wetlands. Primary authority for EPA water programs was established by the Safe Drinking Water Act and the Clean Water Act.[458]

Water programs administered by the EPA include Section 303 of the Clean Water Act which requires states to adopt water quality standards for navigable waters of the United States and to review and update those standards on a triennial basis. Other provisions of the Clean Water Act administered by the EPA include Section 208, which authorizes the preparation of area wide Wastewater management plans, and Section 319 which provides for planning related to control of nonpoint source problems.[459] The EPA oversees the National Pollution Discharge Elimination System permit process, which in California is administered by the State Water Resources Control Board and the Regional Water Quality Control Boards, and the issuance of permits for filling wetlands under Section 404 of the Clean Water Act administered by the

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[456]Ibid.

[457]Office of the Federal Register, National Archives and Records Administration, The United States Government Manual 1995/96, July 1995. 523, 524.

[458]Web at http://www.epa.gov/region09/water/index.html, February 1996.

[459]North Coast Regional Water Quality Control Board, Water Quality Control Plan for the North Coast, 1993, 1-3.00.

Corps of Engineers.[460]

In addition to water quality activities, the activities of the EPA also include air and radiation; solid waste and emergency response; prevention, pesticides and toxic substances; and research and development.[461]

FEDERAL ENERGY REGULATORY COMMISSION

The Federal Energy Regulatory Commission (FERC) is an agency of the U.S. Department of Energy. The FERC issues licenses, and through license conditions, specifies operating conditions for hydroelectric projects, including those at Warm Springs Dam, Coyote Valley Dam and Scott Dam. The Commission was created by the Department of Energy Organization Act on October 1, 1977, to replace the Federal Power Commission. It is made up of five members who serve staggered five-year terms and are appointed by the President and confirmed by the Senate. No more than three commissioners may belong to the same political party. The chair, designated by the President, serves as the Commission's administrative head.[462]

Hydroelectric power regulation was the first undertaken by the Federal Power Commission, FERC's predecessor, after Congress passed the federal Water Power Act of 1920. Subsequent statutes under which the Commission regulates non-federal hydroelectric power projects that affect navigable waters, occupy U.S. lands, use water or water power at a government dam, or affect the interests of interstate commerce include the Federal Power Act of 1935, the Natural Gas Act of 1938, the Natural Gas Policy Act of 1978, the Public Utility Regulatory Policies Act of 1978, and the Energy Policy Act of 1992. The activities of FERC include project licensing and exemptions, dam safety, project compliance activities, investigation and assessment of headwater benefits, review of project proposals by other federal agencies, and interagency coordination. Licensed projects receive comprehensive safety inspections from Commission engineers stationed in Washington and at five regional offices.[463]

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[460]SCWA, Draft Water Supply and Transmission System Project EIR.

[461]National Archives and Records Administration, The United States Government Manual 1995/96, 524.

[462]Web at http://www.ferc.gov, October 1995.

[463]Ibid.

UNITED STATES GEOLOGICAL SURVEY

The United States Geological Survey (USGS) is an agency of the U.S. Department of the Interior. The USGS is the nation's largest earth science research and information agency. The USGS mission is to provide geologic, topographic, and hydrologic information necessary for the wise management of the nations natural resources. This information consisting of maps, databases, and descriptions and analyses of the water, energy and mineral resources, land surface, underlying geologic structure, natural hazards and dynamic processes of the earth.[464]

The USGS provides maps, reports, and information to help others meet their needs to manage, develop, and protect America's water, energy, mineral, and land resources. This information of the USGS aids the finding of needed natural resources, and supplies the scientific understanding needed to help minimize or mitigate the effects of natural hazards and environmental damage caused by human activities.[465]

Some of USGS's activities which may affect the Russian River basin are as follows:[466]

- Earthquakes - The USGS works in collaboration with the California Department of Conservation, Division of Mines and Geology (CDMG), and the California Institute of Technology and the Southern California Earthquake Center, to collect ground-motion data used to produce regional risk-assessment maps that provide estimates of the probability of significant ground movement. Combined with other geologic information, the data are used to produce hazard maps for ground shaking, landslides, and liquefaction. These hazard maps are a basis for building codes and land-use zoning. The CDMG is producing integrated hazard-zone maps with geologic and seismic information.

- Floods - The ability to predict flood frequency and magnitude depends on long-term, widespread, continuous flow records at many sites. The USGS, in cooperation with Federal, State, and about 140 local water agencies, operates or reviews data from about 1,000 surface-water stations throughout California. The data collected are used to

[464]Web at http://www.usgs.gov/bio/usgs/usgs_gen.html, March 1996.

[465]Ibid.

[466]Ibid.

design programs for flood protection that are demonstrated to have measurable, effective and economically sound benefits. Strategically located gaging stations equipped with automatic recording instruments are connected to computerized flood-warning systems. Water levels, precipitation, and other data can be accessed by computer from anywhere.

- Landslides and Mudflows - USGS scientists are creating a computer-generated landslide-hazard map of the Los Angeles area. This map shows the slopes most likely to fail in future earthquakes. In the San Francisco area, a 1982 storm triggered more than 18,000 landslides and debris flows, which resulted in 25 fatalities. To prevent future loss of life, a public warning system was developed by the USGS in cooperation with the National Weather Service. It has been activated during large storms, most recently in January 1995. The identification of areas likely to produce landslides in conjunction with earthquakes or severe storms enables the public, urban planners, and the private sector to address these conditions as part of any future development.

- Marine Wastes - Wastes generated by land-based human activities have been relocated to the ocean floor off the California coast. In one instance, 47,800 containers of low-level radioactive waste were dumped on the continental margin between 1946 and 1970, many in the Farallon Islands, which is a National Marine Sanctuary. The USGS, in cooperation with several federal agencies, has developed computer-enhanced sidescan images to locate drums and other objects. Similar techniques also are used to characterize the deep-ocean areas that may be used as disposal sites for spoil material dredged from San Francisco Bay. The results of this USGS work also can be used by environmental, military, and fisheries-management agencies locally and elsewhere to manage waste-disposal problems and by the fisheries industry to identify areas critical to fish populations.

- Mapping - USGS quadrangle maps provide the only continuous mapping coverage of California at a scale adequate to show major buildings and infrastructure components and every road, creek, and political boundary, registered to a topographic base represented by contour lines. These maps are used for many different purposes and are essential for most resources studies to provide accurate location of study sites. The USGS is cooperating with California's Teale Data Center to reproduce these maps for computer use.

- Geologic Resources - The USGS, in cooperation with the California Department of Conservation, Division of Mines and

Geology (CDMG), conducts geologic mapping activities throughout California for the production and dissemination of geologic information to all levels of government, the private sector, and the general public. Mapping programs involve many government agencies and are linked to research projects at various universities. The USGS and the CDMG are producing geologic maps at a scale of 1:100,000, thus improving on the present statewide coverage at the 1:250,000 scale. Field mapping is conducted at a scale of 1:24,000; these maps are being produced for areas with special interests, including various geologic hazards, specific properties, fault zones, and mineral resources. In addition, maps are being produced that provide three-dimensional representations of geologic structures, such as subsurface connections of parallel faults.

NATIONAL RESOURCE CONSERVATION SERVICE

The Natural Resources Conservation Service (NRCS) is an agency of the U.S. Department of Agriculture. The NRCS works with landowners on private lands to conserve natural resources. Nearly three-fourths of the technical assistance provided by the agency goes to helping farmers and ranchers develop conservation systems uniquely suited to their land and individual ways of doing business. The agency also provides assistance to rural and urban communities to reduce erosion, conserve and protect water, and solve other resource problems.[467]

NRCS, formerly the Soil Conservation Service, relies on many partners to help set conservation goals, work with people on the land, and provide assistance. Its partners include conservation districts, state and federal agencies, NRCS Earth Team volunteers, Americorps members, agricultural and environmental groups, and professional societies.[468]

The nation's 3000 resource conservation districts--virtually one in every county--are the heart of the conservation delivery system. These units of local government are organized under state law They link NRCS with their neighbors and with local priorities for soil and water conservation. They also augment the work of NRCS's conservationists with district programs and

[467]Web at http://www.ncg.nrcs.usda.gov/who.html, December 1995.

[468]Ibid.

with their own technical and support staff.[469] Some of NRCS's most well-known activities are as follows:[470]

- Every 5 years, NRCS conducts the National Resources Inventory on nonfederal rural land in the United States. This inventory shows natural resource trends, such as in land cover and use, soil erosion, prime farmland, and wetlands.

- Over the past decade, NRCS has helped develop and implement 1.7 million conservation plans on 143 million acres of highly erodible cropland as part of the conservation compliance provision of the Food Security Act of 1985. As a result, erosion on the most highly erodible cropland in the nation has been cut by two-thirds.

- NRCS provides assistance to farmers and ranchers to improve water quality. This includes improving nutrient and pesticide management and reducing soil erosion, thus decreasing sediment that would otherwise end up in lakes and streams.

- In many parts of the country where water conservation is a priority, NRCS helps farmers and ranchers conserve water. Soil conservationists help farmers and ranchers irrigate more efficiently.

- NRCS is one of the four primary federal agencies involved with wetlands. It administers the Wetlands Reserve Program. Under this program, conservation easements are purchased from landowners to restore, enhance, or create wetland areas. Ownership, control of access, and some compatible uses remain with the landowner.

- NRCS's Earth Team volunteer program provides an opportunity for Americans to share their ethic of good land stewardship. In 1994, 12,300 volunteers contributed over a half million hours of service, valued at $5.5 million, in agency offices, on the land, and in conservation education programs in schools and communities across the nation.

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[469]Ibid.

[470]Ibid.

Part 3, Current Programs
Chapter I, Water Supply

INTRODUCTION

While a number of the federal, state and local governmental entities identified and discussed in Part 2 are involved with Russian River water supply issues and programs, the Sonoma County Water Agency and the State Water Resources Control Board (SWRCB) are the governmental entities principally responsible for the management of the water supply of the Russian River. The Agency's responsibility has arisen from historical circumstances rather than any specific legislative mandate. The SWRCB responsibility, which is statutory, is discussed in Part 2, Chapter III.

The Agency has two principal water supply functions. The Agency constructs and operates a water transmission system which diverts water from the Russian River and treats and delivers it to a number of public and investor-owned water distribution systems in Sonoma and Marin Counties. This transmission system is financed, constructed, and maintained pursuant to an Agreement for Water Supply and Construction of the Russian River-Cotati Intertie Project, dated October 25, 1974, and last amended June 28, 1995 (1974 Agreement for Water Supply). Signatories to this agreement are the Agency, the cities of Santa Rosa, Rohnert Park, Sonoma, Cotati and Petaluma, the Valley of the Moon and North Marin Water Districts, and the Forestville County Water District.

The Agency also regulates the flow of the Russian River for the benefit of agricultural, municipal and instream uses within Mendocino and Sonoma Counties, and municipal uses in Marin County. This function is carried out pursuant to Decision 1610 of the California Water Resources Control Board dated April 17, 1986. This Decision amended the several appropriative water rights permits held by the Agency and established the criteria for the coordinated operation of the two federal projects, the Coyote Valley Dam Project on the East Fork Russian River and the Warm Springs Dam Project on Dry Creek. The Agency controls the water supply storage space of these U. S. Army Corps of Engineers Projects under contracts with the United States Government.

In Mendocino County, the Mendocino County Russian River Flood Control and Water Conservation Improvement District has an appropriative water right to divert or redivert 8,000 acre-feet per annum of water from the Russian River. This water is

diverted directly by the beneficiaries. The Improvement District and Redwood Valley Water District have a contractual arrangement which allows Redwood Valley to divert water from Lake Mendocino under the Improvement District's water rights under certain conditions. The Improvement District accounts for the water diverted under its rights and reports the use to the State Water Resources Control Board, but does not itself own or operate diversion facilities.

The Improvement District has entered into a contract with the Sonoma County Water Agency which, after certain conditions are satisfied, will permit the Improvement District to divert or redivert an additional 13,000 acre-feet of water from the Russian River under water rights held by the Sonoma County Water Agency.

WATER SUPPLY AND TRANSMISSION SYSTEM PROJECT

The Sonoma County Water Agency is proposing a Water Supply and Transmission System Project (WSTSP) which is the subject of an environmental impact report (EIR) currently under preparation. The objective of the WSTSP is to provide a safe, economical, and reliable water supply to meet the defined future needs of the Agency's service area.[471]

The water contractors (with the exception of Forestville Water District) that are signatories to the 1974 Agreement for Water Supply requested that the agreement be revised to authorize the financing and construction of the water supply and transmission system facilities required to meet their future needs. Preparation of an EIR for a proposed water supply system that would meet these needs was authorized by the Agency's Board of Directors on May 19, 1992, by Resolution No. 92-0716.[472]

There are several purposes of the proposed Water Supply and Transmission System Project. These are 1) to implement water conservation measures that would result in the savings of approximately 6,600 acre-feet per year (AFY), and expand the water education program; 2) to increase the amount of water diverted from the Russian River (a combination of re-diversion of stored water and direct diversion of winter flow) by 26,000 AFY, therefore increasing the total amount of diversion from 75,000 AFY to approximately 101,000 AFY; 3) to provide an offstream

[471]Sonoma County Water Agency. Draft Water Supply and Transmission System Project Environmental Impact Report, September, 1996.

[472]Ibid., 4-2.

source of water for use as an emergency and standby water supply source, with a capacity of 44.5 mgd; and 4) to increase the transmission system capacity by 57 mgd, thereby increasing the total capacity of the transmission system from 92 mgd to 149 mgd.[473]

The Agency releases water from storage in Lake Mendocino and Lake Sonoma for delivery to several municipalities, where the water is used primarily for residential, governmental, commercial, and industrial purposes. The Agency also releases water to satisfy the needs of other Russian River water users and to maintain minimum streamflow requirements established by the State Water Resources Control Board's Decision 1610. These needs are discussed in Part 1, Chapter I.[474]

The Water Supply and Transmission System Project would require the revision of the 1974 Agreement for Water Supply between the Agency and the eight signatories, known collectively as the water contractors, to authorize the development of additional water supply, and the expansion and revised operation of the transmission system. The Agreement for Water Supply would provide for the financing, design, construction, operation, and maintenance of water supply and expanded transmission system facilities. The Agreement for Water Supply would limit the annual delivery obligations of the Agency to each water contractor seeking an increase in delivery entitlements to the amounts necessary to meet the demand levels envisioned by the current general plans adopted by the general purpose governments in those service areas.[475]

In addition to the water contractors, the Agreement for Water Supply also would allow deliveries to "other" transmission system customers. These include users other than water contractors which have connections on the Agency's transmission lines and include mutual and private water companies, parks and other government connections. The Agreement for Water Supply also would allow deliveries to the Marin Municipal Water District (MMWD), although water provided by the Agency to MMWD is covered by two separate agreements, the "Third Amended Offpeak Water Supply Agreement," and the "Amended Agreement for the Sale of Water Between the Sonoma County Water Agency and Marin Municipal Water District," both dated January 1996. The amount of water provided to MMWD will not change with the proposed project, although the proposed expansion of the transmission system would

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[473]Ibid., 4-3.

[474]Ibid., 4-4.

[475]Ibid., 4-5.

benefit MMWD. The expansion of the transmission system would allow MMWD to receive their total annual delivery limit amount.[476]

The Agency also has contracts with non-transmission system customers such as the Russian River County Water District, the City of Healdsburg, and the Town of Windsor, who currently divert water from the Russian River and report it under the Agency's existing water rights permits. The amount of water provided to the non-transmission system customers that divert water under the Agency's permits would not change with the proposed project. All water provided to these agencies is currently accounted for under the existing 75,000 acre-feet per year of water permitted by the Agency's existing water rights permits from the State Water Resources Control Board.[477]

The Agreement for Water Supply would also authorize the reimbursement to the City of Santa Rosa for capacity in a portion of the existing Santa Rosa Aqueduct, and the purchase of the existing West Transmission Main, currently owned by the City of Santa Rosa, which would improve the reliability of the Agency's transmission system.[478]

The water conservation component of the WSTSP consists of expanding the Agency's existing water conservation and water education programs, which are managed by a water conservation specialist. The following eleven of the best management practices prescribed in the 1991 "Memorandum of Understanding Regarding Urban Water Conservation in California", adopted by many water agencies statewide, would be implemented:[479]

- o Residential Water Audits. This measure targets existing residents to reduce indoor and outdoor water use, especially during peak use periods. The top 20 percent of residential water users are offered a free audit that includes indoor water conservation measures and development of an irrigation schedule.

- o System Water Audits. Leak Detection and Repair. This measure targets the water distribution system (the Agency's and the water contractors') and consists of an audit of water distribution systems, including leak detection and repair.

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[476]Ibid., 4-5, 4-6.

[477]Ibid., 4-6.

[478]Ibid.

[479]Ibid., 4-7, 4-8.

- o Metering. Meters would be required on all unmetered water service connections. Existing customers without meters would be retrofitted with meters over a ten-year period.
- o Large Landscape Water Audits and Incentives. This measure consists of conducting audits to increase the irrigation efficiency of landscapes containing more than three acres of landscaping.
- o Commercial/Industrial/Public Incentives for Irrigation System Upgrades. This measure consists of offering customized rebates for any device or technique that can be shown to reduce irrigation water use by more than 750,000 gallons per year per application and reliably provide those savings for at least five years.
- o Low Water-Use Landscape Ordinances. This measure consists of checking plans during the building permit approval process and enforcing existing ordinances through random site inspections for new construction. Existing local ordinances in Sonoma and Marin County require the installation of low-water-use plants and efficient irrigation systems.
- o Commercial/Industrial/Public Indoor Water Audits. This measure consists of contacting building owners and conducting free indoor audits with incentives sufficient to achieve customer implementation of audit findings.
- o Commercial/Industrial/Public Outdoor Water Audits. This measure consists of conducting audits of areas with less than three acres of landscaping, with the goal of establishing the correct watering rates.
- o Water Efficient Landscape and Irrigation System Incentives. This measure offers incentives to residential customers for the installation of water-efficient landscaping and irrigation systems.
- o Ultra Low-Flush Toilet Replacement. This measure consists of offering rebates to residential customers who replace their high water use toilets with ultra low-flush toilets.
- o Incentives for Commercial/Industrial/Public Toilet/Shower Replacement. This measure consists of offering rebates to encourage replacement of existing toilets and urinal valves for commercial, industrial, or public sector customers.

As part of the water conservation component, the Agency would also expand its existing water education program by developing a regional water education curriculum. The program would be oriented to students in kindergarten through sixth

grade, and middle school grades seven through nine. Additional staff would be employed to interpret and teach the new curriculum, which would increase the number of classrooms served. The Agency's property near Wohler would be used as a field study site.[480]

The increased use of the Russian River Project component of the WSTSP would consist of operating Lake Mendocino and Lake Sonoma much as they are now. Releases from Lake Mendocino would not increase as a consequence of the proposed project, but would continue to provide water to satisfy the needs of other Russian River water users below Lake Mendocino to the confluence of Dry Creek; and would continue to maintain minimum streamflows adopted by the State Water Resources Control Board in 1986, with Decision 1610. Releases from storage in Lake Sonoma would be increased as needed to meet the project demands. This water would be conveyed in Dry Creek and the Russian River to the Agency's diversion facilities in the Wohler and Mirabel areas, where it would be pumped into the transmission system and transported to customers in southern Sonoma County and Marin County. Three to four new diversion locations are proposed by the Agency.[481]

The aquifer storage and recovery (ASR) component of the WSTSP, also known as conjunctive use, would consist of the combined and managed use of surface and groundwater supplies. The ASR component would provide an emergency and standby water supply for the Agency's transmission system customers. The ASR component consists of diverting water from the Russian River during the winter, when flows in the river are typically high and demands are low. Water would be diverted at a maximum rate of 31 cfs (20 mgd), at times when the flow in the Russian River exceeds 200 cfs during the period from November to May. The water would be diverted through the Agency's existing and proposed diversion facilities in the Wohler and Mirabel areas. The water then would be transported through the Agency's existing and proposed transmission system pipelines to be injected through a system of wells into the aquifer below the Santa Rosa Plain. This water would be pumped from the aquifer when an emergency, such as a spill of toxic materials in the Russian River, requires that river diversions be reduced or halted completely. Other emergencies which might also cause the wells to be used include power outages at river diversion facilities, or damage to the Ranney collectors or transmission pipelines during an earthquake or flood.[482]

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[480]Ibid., 4-8.

[481]Ibid., 4-9.

[482]Ibid., 4-11.

Transmission system facilities that would be needed for this component consist of a system of wells that would be able to inject (store) water into, as well as extract (recover) water from, the groundwater basin. The wells, which would penetrate the Merced geologic formation in the aquifer beneath the Santa Rosa Plain, would be generally located along the Agency's existing Russian River-Cotati Intertie pipeline between Guerneville Road and Todd Road, west of the city of Santa Rosa. The ASR component would require an application to the SWRCB for a water rights permit for diversion of up to 13,140 acre-feet per year from the Russian River to ASR storage, at a rate not to exceed 31 cfs (20 mgd) during the period from November 1 to May 31, and for the subsequent recovery of this stored water.[483]

The transmission system expansion component of the WSTSP would consist of (1) diversion, water production, and treatment facilities; and (2) distribution facilities, including pipelines, storage tanks, and booster pump stations. The transmission system would be modified to pump additional water from the aquifer below the Russian River via the collectors and move the water throughout the system.[484]

SWRCB RUSSIAN RIVER WATER RIGHTS PROCESS

In January 1995 the State Water Resources Control Board held a workshop to receive comments and recommendations regarding actions which should be taken by the SWRCB to address water rights issues on the Russian River. In May 1995 the SWRCB adopted a process for dealing with these pending water rights issues. This process includes the following phases:[485]

- Conduct an environmental assessment of the potential cumulative effects on river flows of the pending water right applications and develop permit terms that would avoid cumulative impacts. In each case there would be a finding whether additional water is available for appropriation from the proposed source.

- Process pending applications and petitions that do not have significant impacts, or that include specific permit term that would mitigate for local and cumulative impacts.

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[483]Ibid.

[484]Ibid.

[485]State Water Resources Control Board. Division of Water Rights, Staff Report. Russian River, April 1995, 6.

- Act on the Sonoma County Water Agency's petitions to change existing water rights on the main stem of the Russian River, following completion of appropriate environmental documentation.

- Hold a hearing to consider adding streams in the watershed to the SWRCB's declaration of fully appropriated streams. This hearing will result in a determination of streams that are fully appropriated and the season that *is* fully appropriated.

Conduct an Environmental Assessment

Division of Water Rights of the SWRCB staff will conduct a cumulative environmental assessment that will address the overall impacts relating to the pending applications and petitions. A streamflow simulation model and information in the Division's files will be used to determine the availability of water in the main stem and each tributary. To determine instream fish flow needs, all available information, including field studies, consultations with the California Department of Fish and Game, and the modified Tennant method (a method for estimating flows needed for fishery resources) will be used.[486]

Act on Pending Applications and Petitions

Information submitted at the workshop indicates that water may not be available during the critical spring through fall period. In many cases, however, it appears that standard permit terms can be developed that will result in insignificant environmental impacts and will allow for continued processing of water rights applications on the main stem and tributaries. For example, it may be possible to develop standard permit terms that would mitigate the impacts of the following types of projects:[487]

- Small off-stream storage projects with diversions during the peak winter runoff period.

- Small reservoirs constructed upstream from existing reservoirs which are, and will remain, a barrier to fish passage.

- Wells that pump from the underflow of the main stem.

- Petitions for change in place of use, purpose of use, or point of diversion.

[486]Ibid., 6, 7.

[487]Ibid., 7.

If there are unresolved protests, a field investigation or water rights hearing will provide the opportunity to determine the appropriate instream flow requirements, bypass conditions, or other mitigation measures within each tributary. A site-specific environmental document will be prepared for each project.[488]

Act on the Sonoma County Water Agency's Petitions

The Agency has water rights permits issued by the SWRCB that contain conditions relating to the minimum instream flow in the main stem of the Russian River. Review of the applications filed by the Agency to implement its WSTSP will provide the SWRCB with an opportunity to review the adequacy of these instream flows. However, the SWRCB has noted that it adopted its D-1610 determining these flows in 1986. As part of that decision, the SWRCB reviewed information submitted by the California Department of Fish and Game and concluded that there were overriding considerations that justified adoption of the existing instream flow standards. Substantial, new information would be required in order for the SWRCB to modify the existing instream flow standards on the main stem of the Russian River.[489]

Hearing on Fully Appropriated Streams

A water right hearing will be held in accordance with Section 1205 of the California Water Code to determine whether the Russian River and its tributaries are fully appropriated during the spring through fall season. The hearing will review all pending applications for direct diversions during this period. The determination of water availability and whether the stream is fully appropriated during certain seasons will be based on a review of existing diversions, United States Geological Survey streamflow data, the streamflow simulation model, and information submitted by the parties, including information relating to the instream flow needed for the fishery resources.[490]

[488]Ibid.

[489]Ibid., 7, 8.

[490]Ibid.

Chapter II, Water Quality

As in the case of water supply, a number of the federal, state and local governmental entities identified and discussed in Part 2 are involved with Russian River water quality issues and programs. However, the North Coast Regional Water Quality Control Board is the governmental entity principally responsible for the protection of the water quality of the Russian River. The Regional Board carries out its responsibilities pursuant to a basin plan which provides a definitive program of actions designed to preserve and enhance water quality and to protect the beneficial uses of water in the North Coast Region.[491]

As noted in Part 2, Chapter IV, the Federal Clean Water Act (Section 303, 33 U.S.C. 1313) requires states to adopt water quality standards for navigable waters of the United States and to review and update those standards on a triennial basis. Other provisions of the Clean Water Act related to basin planning include Section 208, which authorizes the preparation of area wide Wastewater management plans, and Section 319 which provides for more specific planning related to control of nonpoint source problems.[492]

The basin plan for the North Coast Region is comprehensive in scope. It contains a brief description of the North Coast Region, and describes its water quality and quantity problems and the present and potential beneficial uses of the surface and groundwaters within the Region. Water quality objectives are prescribed. Implementation measures, which include specific prohibitions, action plans, and policies form the basis for the control of water quality. Statewide plans and policies are included as well as a description of the Regional Board's surveillance and water quality monitoring activities.[493]

In response to the watershed management initiative called for in the State Water Resources Control Board's strategic plan adopted in June 1995, the North Coast Regional Water Quality Control Board has divided the North Coast Region into seven management units. The Russian River is situated within the Bodega/Russian River Watershed Management Area. On March 27, 1996 the Regional Board held a public workshop for the Bodega/Russian River Management Area for the purpose of identifying and prioritizing it goals and activities. The

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[491]North Coast Regional Water Quality Control Board, Water Quality Control Plan, 1-2.00.

[492]Ibid., 1-3.00.

[493]Ibid., 1-2.00.

Russian River goals include, the protection of surface water and groundwater uses, the protection and enhancement of the cold and warm water fisheries, and the reduction of waste discharge into the Laguna de Santa Rosa and Stemple Creek. The specific measures identified and prioritized to protect surface water uses include the following activities:[494]

- inspecting Wastewater dischargers
- keeping all seven Russian River municipal dischargers on schedule for advanced Wastewater treatment
- processing the City of Santa Rosa's long-range subregional Wastewater plan
- implementing and enforcing nonpoint source discharge best management practices
- assessing and monitoring toxics
- investigating the occurrence of mercury in fish flesh in Lakes Pillsbury, Mendocino and Sonoma
- maintaining an effective individual waste disposal program
- maintaining water quality monitoring stations
- assisting and coordinating the development by the Sonoma County Water Agency of an early warning system for toxic spills

The basin plan contains specific water quality objectives and implementation programs to protect and enhance identified beneficial uses. For the Russian River and its tributaries, the discharge of waste is allowed under National Pollution Discharge Elimination System (NPDES) permits only during the period October 1 through May 14 and at a flow not in excess of one percent of the flow of the receiving water. Additionally, municipal dischargers must meet, or be on a schedule to meet, advanced waste treatment levels. The basin plan provides exceptions as specified in individual action plans. Under such an exception, the City of Santa Rosa is allowed to discharge to the Laguna de Santa Rosa with the dilution requirement applying to the Russian River flow at Hacienda Bridge. Discharge rates up to five percent of this flow may be made with the permission of the

[494]North Coast Regional Water Quality Control Board, Goals and Activities for the Russian River/Bodega Watershed Management Area, April 1996.

Regional Board's Executive Officer.[495]

Communities served by Wastewater treatment facilities under NPDES permits include Ukiah, Cloverdale, Geyserville, Windsor, Santa Rosa, Forestville, Graton, Guerneville and Occidental. Advanced waste treatment is required for these facilities, and Windsor, Guerneville, Ukiah and Santa Rosa have constructed advanced waste treatment works. Forestville and Graton are on schedules to attain that level of treatment.[496]

The City of Healdsburg discharges secondary effluent to an abandoned gravel pit in the Russian River flood plain. The pit was overtopped during the winter of 1994-1995 and the city is pursuing other means of discharge.[497]

The City of Santa Rosa is currently preparing an environmental impact report (EIR) for a proposed long-range plan for Wastewater disposal. The Notice of Preparation for the Santa Rosa Subregional Long-Term Wastewater Project was issued in October 1994. Preparation of the draft EIR has been completed and it was issued for public review and comment in August 1996.

In May 1996 the Sonoma County Board of Supervisors, acting in their capacity as the Board of Directors of the Russian River Sanitation District, considered a report on a proposed West County Sanitation Project. The objectives of this project are as follows:[498]

- Utilize the existing capacity at the Russian River County Sanitation District Wastewater treatment facility.
- Remediate existing problems at the Russian River facility, including insufficient dry-weather disposal.
- Achieve compliance with the treatment requirements in the basin plan.
- Reduce the costs associated with the operation of several small treatment facilities.

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[495]North Coast Regional Water Quality Control Board, Watershed Planning Chapter, March 1996, 2.1-8.

[496]Ibid., 2.1-3, 2.1-4.

[497]Ibid., 2.1-4.

[498]SCWA, West County Sanitation Project, 1, 2.

- Remediate existing public health hazards in the Mirabel Heights, Camp Meeker and Monte Rio areas.

- Minimize growth-inducing impacts by limiting service to existing housing units and vacant parcels within the boundaries of each respective area.

In July 1996 the Board of Supervisors decided to address the utilization of existing capacity and remediation of the existing problems at the Russian River facility separately from the other problems.

Chapter III, Recreation and Public Access

INTRODUCTION

There *is* no single governmental agency which is principally responsible for recreation and public access on the Russian River. The U.S. Army Corps of Engineers operates, and from time to time improves, the recreation facilities described in Part 1, Chapter III at Lake Mendocino and Lake Sonoma. The recreation and park districts described in Part 2, Chapter II operate summer dams and other facilities at several locations. Other agencies described in Part 2 are involved with recreation and public access along the Russian River in various ways. While no agency is principally responsible for recreation and public access, the Sonoma County Board of Supervisors, acting through its Regional Parks Department and the Sonoma County Agricultural Preservation and Open Space District in cooperation with other agencies, has assumed a leading role in addressing some of the needs identified in the *Russian River Public Access & Trespass Management Plan* which is discussed in Part 1, Chapter III.

STEELHEAD BEACH PARK

Steelhead Beach is located on the south bank of the Russian River, just off River Road between Mirabel Road and Martinelli Road. The park site consists of 17 acres owned by the State of California.499 The initial Steelhead Beach Park development will be contained within this area, however, the California Wildlife Conservation Board has acquired an adjacent 26 acres.[500]

This river recreation-oriented park will accommodate both camping and day use activities, as well as a boat launch facility. The key elements envisioned in the park design are as follows:[501]

- Park entrance station on a paved entry road, an internal road system, and pedestrian pathways.

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[499]Sonoma County Regional Parks Department, Steelhead Beach Park Preliminary Plan & Initial Study, November 1995, 1.

[500]Philip Sales, Sonoma County Regional Parks Department, personal communication on July 18, 1996.

[501]Sonoma County, Steelhead Beach Park Plan, 4.

- o 137 space parking lot which will accommodate vehicles and boat trailers, and a concession trailer site with utility hook-ups.
- o Restroom, and shower facilities to be installed in conjunction with campground development.
- o Day use area, boat launch area, and day use fishing area.
- o 27 recreation vehicle camping spaces for recreation vehicles and car camping.
- o 21 car camping/walk-in camp sites, with 11 parking spaces.
- o Habitat restoration throughout the site, with particular emphasis on the western section.

The estimated cost of the planned improvements is $1.7 million. The Sonoma County 1996-1997 budget includes $300,000 for initial development.[502]

CLOVERDALE RIVER PARK

In June 1996 the Board of Supervisors of Sonoma County, acting as the Board of Directors of the Sonoma County Agricultural Preservation and Open Space District, approved the acquisition of an addition of 10 acres to the 30 acres of land which was previously acquired by the District for development as the Cloverdale River Park. The City of Cloverdale owns 33 acres immediately south of the land bought by the District. In 1995 it installed picnic tables and a bicycle rack on a small portion of this land through a community fund drive.[503]

This river recreation-oriented park will accommodate day use activities, including a boat launch facility. The initial elements envisioned by the Sonoma County Regional Parks Department are as follows:[504]

[502]Philip Sales, Sonoma County Regional Parks Department, personal communication on July 18, 1996.

[503]Tom Chorneau, County OKs buying 10 acres for Cloverdale park, The Press Democrat, June 19, 1996, B-l.

[504]Sonoma County Regional Parks Department, Draft Regional Park Feasibility Study. Cloverdale River Park, March 1996, 9.

- o Permanent entrance at Crocker Road and improvement and paving of existing access road.
- o Paved parking area for 20 cars.
- o Fencing and screening of the existing water treatment facility.

Subsequent improvements will include of a trail head and 5800 feet of trail, a McCray Road access and parking area, additional picnic sites and support areas, permanent restroom facilities, a boat launch site and portages for kayaks and canoes, group picnic areas, and benches along the trail at scenic points.[505]

The estimated cost of the planned improvements is $700,000. The Sonoma County 1996-1997 budget includes $200,000 environmental documents, design and initial development.[506]

HEALDSBURG RIVER ACCESS

In June 1996 the Board of Supervisors of Sonoma County, acting as the Board of Directors of the Sonoma County Agricultural Preservation and Open Space District, approved the acquisition of 106 acres of land located adjacent to the northeast boundary of Healdsburg. The scenic ranch, located north of March Avenue, is already used by mountain bikers, joggers and hikers.[507]

Under the open space agreement approved May 7, 1996 with the property owner, Raja Development Co., the company will donate the parcel to the City of Healdsburg to be used as a public park. The company further agreed to contribute $100,000 to Healdsburg for operation and maintenance of the park. The property, which has Russian River access, will be formally opened to hikers and other recreational users by the end of 1996.

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[505]Ibid., 9, 10.

[506]Philip Sales, Sonoma County Regional Parks Department, personal communication on July 18, 1996.

[507]Tom Chorneau, County deals for site with river access, The Press Democrat, May 8, 1996, B-l.

[508]Ibid.

WINDSOR RIVERFRONT PARK

In June 1996 the Sonoma County Regional Parks Department completed a feasibility study of developing six parcels of land owned by Kaiser Sand and Gravel as a river-oriented regional park. These properties consist of 328 acres, 146 acres of which are bodies of water. The non-submerged land includes 21 acres of vineyard. The remaining 160 acres are available for passive recreation.[509]

The conceptual plan for Windsor Riverfront Park envisions an access road off of Eastside Road, and the addition of two new picnic areas along the Russian River to supplement the existing picnic area adjacent to Eastside Road. The plan includes three lakes; Lake Benoist, Lake Wilson and Lake McLaughlin. One parking lot would be located adjacent to the existing picnic area. A second parking lot would be located between Lake McLaughlin and the Russian River. Extensive restorative tree planting would be done along the shores of the lakes. The existing unpaved access roads would be utilized as trails following the shores of the restored lakes.[510]

The estimated cost of developing the proposed Windsor Riverfront Park is $330,000.511

[509]Sonoma County Regional Parks Department, Regional Park Feasibility Study, Kaiser Sand & Gravel Property, June 1996, 4.

[510]Ibid., Appendix i.

[511]Ibid., Appendix vi.

Chapter IV, Gravel Mining

INTRODUCTION

Gravel mining is regulated in California under the Surface Mining Act of 1975 which was described in Part 2, Chapter I. While certain federal and state agency play a role in regulating gravel mining, counties and cities have the principal responsibility.

On November 1, 1994 the Sonoma County Board of Supervisors certified the final environmental impact report for comprehensive revisions to the 1980 Sonoma County Aggregate Resources Management Plan and adopted a new plan. The purpose of the Aggregate Resources Management Plan is to provide for future aggregate needs with resources from within the County while avoiding or minimizing significant impacts and promoting the efficient use of the resource.[512]

The major objective of the plan's quarry management program is to increase quarry production for all uses and replace terrace sources as the primary supply for future construction aggregate. The plan proposes to meet this objective with a combination of regulatory incentives, aggregate standards, and stricter limitations on competing alluvial sources.513

The plan's terrace management program allows deep-pit terrace mining at the average 1980's rate of 20 acres per year for ten years. No significant impacts on adjacent groundwater levels will be allowed. A 450-foot separation will be required between new pits and the river. Reclamation plans are required. The plan includes specific standards for the post-mining uses of wildlife habitat, plant crops, aquaculture, water supply, recreational facilities and Wastewater storage. Standards are also included to address how pits can be refilled with aggregate, processing sediments or imported earth materials.[514]

While both quarry operations and terrace mining have the potential to affect the Russian River, the remoteness of the quarries from the river, and the 450-foot separator required for terrace pits, reduces the probable effects to a level below the threshhold of interest for the purposes of this study. For this

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[512]Sonoma County. Management Plan and EIR, 1994, 7-1.

[513]Ibid., S-7.

[514]Ibid., S-7, 8.

reason, the balance of this chapter addresses instream mining.

Syar Industries, Inc. holds "vested rights" to mine substantial quantities of aggregate from five sites located along a nine-mile reach of the Russian River beginning just north of Wohler Bridge at river mile 25, and ending east of Healdsburg at river mile 34. The sites are known as Doyle, South Levee, Middle Reach, North Levee and Riverbend. While the mining of these sites by Syar is not subject to the County regulation, reclamation plans for any mining must be approved by the California Board of Mining and Geology. In addition, a Federal Clean Water Act, Section 404 permit must be obtained from the U.S. Army Corps of Engineers. Syar also is seeking permission to mine a sixth site, known as Healdsburg Bendway, from the City of Healdsburg.[515]

No plan, equivalent to the Sonoma County plan, currently exists to provide for future aggregate needs of Mendocino County while avoiding or minimizing impacts. However, Mendocino County Water Agency is in the process of developing an aggregate resources management plan for Mendocino County. A draft of that plan is expected to be completed in 1996. Currently, applications for use permits for gravel mining are considered on a case by case basis by the County of Mendocino based on a review and recommendations by the Mendocino County Water Agency.[516]

REGULATION OF INSTREAM MINING

One of the major objectives of the 1994 Sonoma County Aggregrate Resources Management Plan is to maintain a balance between aggradation and degradation that reflects the natural recharge of aggregate. This is to be accomplished by managing production of aggregate to assure the remove only the net accumulation of aggregate within the channel and by regulating the location, extent, depth and frequency of gravel extraction.[517]

The 1994 Plan standards impose substantial limits on the extraction of gravel from the Russian River channel. The channel

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[515]EIP Associates, Draft Environmental Impact Report and Environmental Impact Statement, Syar Industries, Inc Mining Use Permit Application, Reclamation Plan, and Section 404 Permit Application, July, 1993.

[516]Dennis Slota, Mendocino County Water Agency, personal communication on February 29, 1996.

[517]Sonoma County. Management Plan and EIR, 7-11.

length designated for multi-year permits is reduced from 14 miles to 11 1/2 miles. Extraction after the first year is limited to removal of gravel deposited since the last mining, as determined by cross-sections. No skimming of the upstream halves of gravel bars is permitted unless justified by a special study. Gravel removal from any site may be limited on the basis of monitoring data to achieve the Plan objectives.[518]

Mining is permitted in undesignated areas under use-permits for one-time skimming only with findings of significant benefit to flood control, bank protection, public water supply, fisheries, recreation or habitat. Extraction is not allowed more than once in three calendar years at any undesignated location. No new permits are to be granted for gravel removal from channel of the middle reach or Dry Creek with certain limited exceptions.[519]

The 1994 Plan establishes an extensive monitoring program. This program includes aerial photography of the Russian River from Wohler Bridge to the county line and extensive surveyed cross-sections. The cross-sections being surveyed annually under the plan include the following:[520]

- 11 locations in the middle reach (since 1981)
- 4 locations near Cloverdale (since 1990)
- 26 locations in Alexander Valley and Fitch Mountain area (since 1993)
- 9 locations in Alexander Valley and middle reach to fill in gaps (since 1994)
- 3 locations at each of the Crocker Road bridge, Geyserville bridge and Jimtown bridge.
- every 400 feet in proposed mining areas
- Sonoma County Water Agency's 14 locations at its water intakes, 3 near Healdsburg and 9 in the Alexander Valley (since 1980)

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[518]Ibid., 7-12 through 7-26.

[519]Ibid., 7-12, 21.

[520]County of Sonoma. Workshop on Standard & Monitoring Instream Gravel Mining Material, February 21. 1996.

o Syar Industries 41 locations in the middle reach (since 1992)

In 1996, an analysis of the cross-section monitoring data collected from 1991 through 1995 on the Russian River by the Sonoma County Water Agency, the Sonoma County Permit and Resource Management Department, and instream gravel mining operators was made. The purpose of the report on this analysis was to provide a broader, more current data base to decision-makers considering the approval of instream mining requests and to facilitate further analysis, discussion, and understanding of sediment transport and river bed dynamics which can serve as a basis for instream mining policies. [521]

The number of cross-sections used in the 1993, 1994 and 1995 years allowed a more accurate estimate of volume changes than has been possible in the past. Where cross-sections exist approximately every 400 feet, volume change estimates are expected to be within plus or minus 10 percent of the actual changes. Volume calculations based on cross-sections up to one-half mile apart are less accurate but volume calculations are still considered to be significant. Volume calculations based upon cross-sections spaced further apart than one-half mile cannot be relied upon as a basis for river management decisions or instream mining policies.[522]

The analysis indicates that the bed of the Russian River in Alexander Valley lost 554 thousand tons between the 1993 and 1994 surveys, and gained 775 thousand tons between the 1994 and 1995 surveys. These changes are attributable to the combined effect of sediment transport and gravel mining. In the 1993-1994 high-flow season streamflows were below normal. During the summer of 1993, 376 thousand tons of gravel were mined from this reach. The additional 178 thousand tons which was lost from this reach was transported downstream during the 1993-1994 high-flow season.[523]

In the 1994-1995 high-flow season streamflows were substantially above normal. During the summer of 1994, 309 thousand tons of gravel were mined from this reach. Thus the reach received 1,084 thousand tons from upstream for the net gain

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[52l]Sonoma County Water Agency and the Sonoma County Permit and Resource Management Department. Analysis of Surveyed Cross-Section Data for the Russian River. 1991 to 1995, May 1996.

[522]Ibid., 8.

[323]Ibid., 8, 9.

of 775 thousand tons.[524]

The analysis indicates that the bed of the Russian River in the middle reach lost 152 thousand tons between the 1993 and 1994 surveys, and gained 574 thousand tons between the 1994 and 1995 surveys. No gravel mining occurred in this reach during the summers of 1993 and 1994.[525]

Neither of these high-flow seasons experienced normal streamflow. Flows in the 1993-1994 season were approximately 30 to 40 percent of normal and in the 1994-1995 season they were approximately 350 to 500 percent of normal. Additional data and studies will be necessary to determine the amount of gravel that can be mined on a sustained basis without long-term degradation of the river bed. A digital terrain mapping system is being considered to provide this data. It would provide greater accuracy, more information, and high quality graphics to aid future analysis. Such a system could be implemented for about the same cost as the combined amount now being expended by public agencies and mining operators on river monitoring.[526]

[524]Ibid., 9.

[525]Ibid., 10.

[526]Ibid.

Chapter V, Fishery

INTRODUCTION

The California Department of Fish and Game is the governmental entity principally responsible for the management of the Russian River fishery. This responsibility arises from the powers of the Department described in Part 2, Chapter III and a mandate included in the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act. In adopting the Anadromous Fisheries Program Act, the legislature declared that the Department shall develop a plan and program that strives to double the current natural production of salmon and steelhead trout resources. The legislature further declared that it is the policy of the state to recognize and encourage the participation of the public in privately and publicly funded mitigation, restoration, and enhancement programs in order to protect and increase naturally spawning salmon and steelhead trout resources.[527] A number of the federal, state and local governmental entities identified and discussed in Part 2 are also involved with Russian River fishery issues and mitigation, restoration, and enhancement programs in cooperation with the Department.

RUSSIAN RIVER BASIN PLANNING AND RESTORATION PROJECT

The Russian River Basin Planning and Restoration Project was undertaken by the California Department of Fish and Game in accordance with the Anadromous Fisheries Program Act. The goals for the Russian River are as follows:[528]

- Inventory and categorize the Russian River basin and subbasins following standard methodologies discussed in the *California Salmonid Stream Habitat Restoration Manual*[529].
- Generate individualized tributary restoration plans and recommendations.

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[527]California Fish and Game Code, Division 6, Part 1, Chapter 8, commencing at Section 6900.

[528]California Department of Fish and Game, Russian River Basin Planning 1994 and 1995.

[529]Flosi and Reynolds. California Salmonid Stream Habitat Restoration Manual, 1994.

- o Initiate restoration work, prioritized according to the fishery habitat potential and opportunity in the river.

- o Develop a better stewardship role for private landowners and land managers.

Most of the Russian River basin is held by private landowners. Therefore, gaining access permission from landowners is the key to conducting inventories. Landowner cooperation is also essential to the successful implementation of recommended habitat improvements. [530]

Once access is obtained, biological sampling is conducted using electrofishing or direct observation to determine fish populations. Year around temperature data and macro-invertebrate sampling is performed to help understand watershed conditions and to identify sources and problems arising from non-point discharges of pollutants. Data collection in all tributaries which are surveyed includes habitat typing, stream channel typing, stream temperature monitoring, and biological sampling to describe fish populations. Based upon need, some tributaries surveyed also receive substrate sampling, macro-invertebrate sampling and riparian surveys.[531]

The stream inventory data are analyzed in tabular and graphic form, and presented in standardized Subbasin inventory reports. The reports conclude with recommendations for fish habitat improvement within the watershed and are distributed to landowners and interested groups. The Department and interested groups then meet and determine project priorities according to the fishery habitat restoration potential and landowner willingness. This approach of working cooperatively and building trust with private landowners develops a sense of stewardship of the natural resources. Examining the river from a watershed perspective allows the comprehensive consideration of problems for fish and landowners alike.[532]

In 1994, inventories and reports were completed for Green Valley Creek, Purrington Creek, Willow Creek, Ackerman Creek and Griffin Creek. In 1995, fish habitat inventories or electrofishing surveys were completed in the upper portion of Big Austin Creek, Bear Pen Creek, Atascadero Creek, Jonive Creek, Griffin Creek, Mill Creek, Felta Creek, Wallace Creek, Palmer Creek, Angel Creek, Salt Creek, Freezeout Creek, Alder Creek,

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[530]CDF&G, Basin Planning.

[531]Ibid.

[532]Ibid.

Robinson Creek and Mohr Creek. A total of 67.4 miles of stream was surveyed.[533]

During 1994 and 1995, the Department supervised 12 habitat restoration projects, including debris jam modification, log structures and erosion control projects. The Department assisted landowners with technical advice on 15 other projects.[534]

An active program is planned for 1996. In Sonoma County inventories are planned for Sheephouse Creek, Porter Creek and a number of tributaries of Austin Creek, East Austin Creek and Maacama Creek. In Mendocino County, juvenile surveys are planned for York Creek, Salt Hollow Creek and a number of tributaries of Forsythe Creek.[535]

SONOMA COUNTY WATER AGENCY FISHERIES ENHANCEMENT PROGRAM

In April, 1995, the Board of Directors of the Sonoma County Water Agency authorized the Agency to undertake a Russian River tributaries Fisheries Enhancement Program. The Board subsequently authorized two new environmental specialist positions to assist in implementing the program. In July, 1996 the Board approved a Fisheries Enhancement Program 1996-1997 fiscal year Work Plan and authorized the General Manager to execute cooperative agreements with public and private agencies, and to purchase materials and supplies, necessary to carry out the Work Plan, in a total estimated amount of $164,900 to $229,000.

The objectives of the Agency's Fisheries Enhancement Program are:[536]

- To work cooperatively and in conjunction with other federal, state and local agencies to preserve, enhance and restore fishery habitats and resources.
- To develop research programs to study the fisheries within affected watersheds.

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[533]Ibid.

[534]Ibid.

[535]Ibid.

[536]Sonoma County Water Agency, Fisheries Enhancement Program 1996-1997.

o To assist the Agency in the assessment of impacts, the writing of environmental documents, and permit compliance for Agency projects which may affect fishery resources.

In coordination with the California Department of Fish and Game and other agencies, the following projects are planned to be completed by June 30, 1997:[537]

Stream Habitat Surveys

The Agency will conduct habitat surveys on streams identified by the Department as having salmonid populations. Surveys will be conducted according to the *California Salmonid Stream Habitat Restoration Manual,* All data will be entered into the Department's data base. Streams to be surveyed are Mark West Creek, Porter Creek, Windsor Creek and Humbug Creek.

Temperature Data Collection

One to five temperature data loggers will be furnished and placed by the Agency in each creek during the low flow season. Data loggers will be monitored at least once each season.

Parcel Ownership Information

The Agency will assist the Department by identifying property owners along the tributaries. Once permission has been granted, each property owner will by notified of the date that the stream will be surveyed by a representative of the Department or Agency.

Instream Habitat Improvements

In cooperation with the Department and with the Sotoyome-Santa Rosa Resource Conservation District, instream structure, such as large woody debris, and erosion control devices will be placed in streams identified during habitat surveys as candidates for instream habitat improvement. The Agency will administer the Agency's component of the projects. The Department will provide labor crews. A grant from the Northwest Emergency Assistance Program through the Sotoyome-Santa Rosa Resource Conservation District may provide unemployed commercial fishermen for the labor on these projects. If not, the work will be completed by the California Conservation Corps. Wood not available at the site will be transported from Berry's Sawmill in Cazadero by the Agency. Additional materials such as cable, hardware, and hand tools will be provided by the Agency. Projects on Green Valley Creek, Freezeout Creek, Mill Creek, Austin Creek and Felta Creek

[537]Ibid.

will be performed in 1996. Projects for 1997 will be identified based on the survey data available at that time.

Instream Habitat Structure Construction Training

Experts from the Department, the Agency, and restoration consultants will train individuals in the community who are interested in working on habitat improvement projects. Classroom instruction will be held in the North Coast Regional Water Quality Control Board conference room while field training will occur at one of the designated stream sites.

Riparian Area Fencing Projects

Wire fencing will be installed along stream banks. The purpose of these projects is to isolate livestock from stream channels and riparian areas that traverse grazed land. The fencing will exclude livestock which will allow riparian vegetation to recover, stabilize the stream banks, and decrease animal waste entering the stream. Fencing projects are planned for Green Valley Creek, Freezeout Creek and Mill Creek. These interagency projects will be carried out in a manner similar to the instream habitat improvement projects.

Riparian Area Irrigation Projects

The purpose of these projects is to provide a temporary water source to restored riparian areas to enhance survival of newly-planted trees. Tree planting projects along Green Valley Creek and Mill Creek will be conducted by Trout Unlimited. The Agency will provide the irrigation materials needed to complete these projects. The Department, in cooperation with the landowners, will be responsible for the maintenance and inspection of the irrigation systems.

Water Quality Sampling

In cooperation with the Sotoyome-Santa Rosa Resource Conservation District and the North Coast Regional Water Quality Control Board, invertebrate diversity and abundance in Mark West Creek and Santa Rosa Creek will be determined. Sampling will be performed by the Agency in the fall and spring for a period of two to three weeks each season. Processed samples will be sent to the Department's laboratory in Sacramento, with which the Agency will contract for identification services.

Matanzas Creek Fishway Project

The Agency will design and construct features to facilitate fish passage through the Matanzas Creek flood control structure in downtown Santa Rosa. Habitat assessment and design of a fish passage device is planned to be carried out in 1996 with

construction planned for 1997.

Neighborhood Stream Cleanup Projects

Streams flowing through urban areas accumulate litter and debris. Neighborhood stream cleanup projects will be organized to augment restoration efforts and increase community involvement. These projects will be conducted within the Russian River watershed wherever sufficient community interest is present.

Chapter VI, Barriers to Fish Migration

INTRODUCTION

The California Department of Fish and Game is the governmental entity principally responsible for addressing the problem posed by barriers to fish migration. This responsibility arises from Section 5900 et seq. of the California Fish and Game Code which deals with dams, conduits and screens and the responsibility for providing adequate bypass flows, fishways and fish screens. Under this authority and under the stream alteration agreement process established by Section 1601 and 1603 of the California Fish and Game Code, which is discussed in Part 2, Chapter III, the Department takes action to secure the removal of barriers to fish migration and the installation of fish passage devices. Examples include the recent elimination of the practice of installing summer dams in Austin Creek and the steps taken by the Department to secure the construction of a fishway at Healdsburg Dam.

In addition to these programs of the Department of Fish and Game, the Sonoma County Water Agency is pursuing several programs in cooperation with the Department and other agencies.

MATANZAS CREEK FISHWAY

The Sonoma County Water Agency has initiated design of a project to allow anadromous salmonids to pass through existing migration barriers at the mouth of Matanzas Creek. The fishway will provide salmonids access to approximately 8 miles of habitat that has been inaccessible for over 30 years. Design will occur during 1996 with installation planned during the summer and fall of 1997.[539]

Historically, Matanzas Creek supported a self-sustaining steelhead fishery. However flood control structures constructed in downtown Santa Rosa during the early 1960's created impassible barrier at where Matanzas Creek enters Santa Rosa Creek. While the adjacent Santa Rosa Creek structure design included a fishway, the Matanzas Creek structure did not. Fish passage through the 1400 foot long structure is prohibited by high water

[538]California Department of Fish and Game. Draft Eel River Action Plan, March 1996, F-l.

[539]SCWA. Fisheries Enhancement Program, 6.

velocities and shallow summer depths. The proposed design would add roughness features to increase depth and reduce velocities during lower flow conditions.[540]

The installation of roughness features has been avoided in the past because they reduce the flood carrying capacity of the structures. However, new designs have been developed which collapse during high flow conditions. Following a major storm the roughness features are reset, restoring the fish passage function.[541]

RUSSIAN RIVER ESTUARY MANAGEMENT PLAN

As noted in Part 1, Chapter VI, the Russian River estuary is subject to periodic closure by the formation of a sandbar across the mouth of the estuary. Closures usually occur in the spring, summer, and fall when the Russian River flow is low, with most occurring in the summer months. Artificial breaches of the estuary bar have taken place since at least 1968. However, recent regulatory actions have caused a reexamination of this practice.[542]

A Russian River estuary study was carried out in 1992 and 1993 for the County of Sonoma and the California State Coastal Conservancy under the direction of the Russian River Estuary Interagency Task Force. Agencies represented on the task force included the following:[543]

California Department of Fish and Game
California Department of Parks and Recreation
California Coastal Commission
U.S. Army Corps of Engineers
National Marine Fisheries Service
U.S. Fish and Wildlife Service
State Lands Commission
California Coastal Conservancy
County of Sonoma

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[540]Ibid.

[541]Ibid.

[542]Sonoma County, Russian River Estuary Study, 44.

[543]Sonoma County Water Agency, Status Report on Implementation of the Russian River Estuary Management Plan, July 1996, 1.

The study concluded that the current practice of breaching the barrier whenever the water surface in the estuary reaches a defined elevation facilitates a viable estuarine ecosystem. The study concluded that the ecosystem has adapted to the shifts in salinity and water temperature and that no serious effects to the biota as a result of water quality problems are observable.[544]

The study prescribed the several elements of a management plan for the Russian River estuary. These elements include the following:[545]

- Breaching. The barrier will continue to be breached by bulldozer. The recommended maximum water level is 7.0 feet NGVD (National Geodetic Vertical Datum), however, under certain circumstances, the water level in the estuary may be allowed to reach 8.5 feet NGVD.

- Tide Staff. A tide staff should be installed next to the county gage at Jenner, relative to NGVD.

- Automated Tide Recorder. An automatic tide recorder should be installed at the Jenner gauge. The water levels will be telemetered to an entity designated by the County.

- Hydrological Monitoring. Continuous monitoring of water surface elevations and periodic monitoring of water quality parameters should be undertaken.

- Biologic Monitoring. Spring and fall otter trawl sampling should be done in the lower estuary; late spring and early summer deep water beach seine samples should be done in the lower estuary; behavioral observations (3) of pinniped activity during breaches under restricted public access should be done; and plankton tows at the mouth of Willow Creek three hours post breaching (two per year).

The responsibility for the implementation of the Russian River Estuary Management Plan was transferred to the Sonoma County Water Agency in April 1995. The Agency has implemented all of the above elements of the Russian River Estuary Management Plan. In November 1995 the Agency breached the barrier under regulatory permits which had been secured by the County of Sonoma and which were extended upon application by the Sonoma County

[544]Ibid.

[545]Ibid., l, 2.

Water Agency.[546]

However, these permits have since expired. The Agency initiated the securing of new permits in October 1995 with a letter to the U.S. Army Corps of Engineers requesting a 5-year permit pursuant to Section 404 of the Clean Water Act. The following permits are required for the Agency to lawfully breach the barrier:[547]

- U.S. Army Corps of Engineers
  Section 404 of the Clean Water Act Permit
- North Coast Regional Water Quality Control Board
  Section 401 of the Clean Water Act Certification
- California Coastal Commission
  Coastal Development Permit
- California Department of Fish and Game
  Section 1601 Stream Alteration Agreement
- State Lands Commission
  Public Agency Lease
- California Department of Parks and Recreation
  Temporary Use Permit

The Agency has applied for all of these and plans pursue securing the permits necessary to implement the Russian River Estuary Management Plan, and to implement the plan.

HEALDSBURG DAM FISHWAY

Pursuant to Section 5931 of the California Fish and Game Code, the California Fish and Game Commission directed CDFG to cause plans to be furnished for a suitable fishway and to order the County of Sonoma to provide the dam with a durable and efficient fishway of such form and capacity and in such location as shall be determined by the Department.548 The County of Sonoma entered into a stipulation with the California Department of Fish and Game (CDFG) agreeing to construct the fishway. Plans were

[546]Ibid., 2.

[547]Ibid., 2, 3.

[548]California Department of Fish and Game, Decision and Order, April 27, 1989.

prepared by the Sonoma County Water Agency in cooperation with the County and Department. However, construction was delayed by a lawsuit brought by the City of Healdsburg against CDFG and the County. The County-CDFG agreement was set aside by the Superior Court until CDFG complies with the California Environmental Quality Act (CEQA) with respect to the project.[549] CDFG has initiated the environmental review process. The Sonoma County Water Agency has budgeted funds to construct the fishway once CEQA compliance has been obtained by CDFG, and an appropriate agreement has been entered into between the County and Agency.[550]

549CDFG, Status of the Proposed Healdsburg Dam Fishway in Sonoma County, 6, 7.

[550]Randy D. Poole, Sonoma County Water Agency, personal communication on April 1, 1996.

Chapter VII, Riparian Habitat

INTRODUCTION

As is the case with recreation and public access, there is no single governmental agency which is principally responsible for the preservation and enhancement of riparian habitat on the Russian River and its tributaries. While both the Russian River Basin Planning and Restoration Project and the Sonoma County Water Agency Fisheries Enhancement Program discussed in Part 3, Chapter V include riparian area features, they also include instream features. There are several programs being carried out by cities which involve the preservation and enhancement of riparian areas. These projects typically also include recreational features. These programs are described in the following sections.

SANTA ROSA CREEK MASTER PLAN

The Santa Rosa Creek Master Plan was a joint effort of the City of Santa Rosa, the County of Sonoma and the Sonoma County Water Agency. It was adopted in September 1993. The master plan is a long-range blueprint for the preservation of the healthy portions of Santa Rosa Creek, the restoration of the degraded areas, and the reestablishment of parts of the creek for human use and appreciation. The plan addresses fish and wildlife habitat, flood control, recreation and circulation.[551]

The plan contains policies and descriptions of physical improvements to guide restoration, recreation and development projects along the creek corridor. Although it is site specific and provides some detail, it is conceptual in nature. The plan has the following ten goals:[552]

- Conserve and restore natural habitat.
- Maintain hydraulic capacity.
- Respect private property.
- Enhance public access.

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[551]City of Santa Rosa, County of Sonoma and Sonoma County Water Agency, Santa Rosa Creek Master Plan, September 1993, 3.

[552]Ibid., 4, 5.

- Provide recreational opportunities.
- Designate creek-oriented commercial areas.
- Enhance aesthetic values.
- Provide educational opportunities.
- Establish an alternative transportation mode of bikeways and pathways.
- Take advantage of opportunities to be part of regional trails systems.

The estimated total cost of implementing the Santa Rosa Creek Master Plan is $55.5 million in 1993 dollars.[553] Two major projects have been initiated by the City of Santa Rosa to implement the plan.

Prince Memorial Greenway

The Prince Memorial Greenway project consists of creek restoration and greenway development along Santa Rosa Creek between Railroad Avenue and Santa Rosa Avenue. The project includes the following components:[554]

- Restoration of the habitat for steelhead trout by establishing a low flow natural creek bottom with riffles and pools, adding shade trees to cool the water, and natural vegetation between pathways.
- Modification of the channel cross-section to accommodate the restoration and at the same time maintain the design hydraulic grade line during *a* 100-year return frequency storm.
- Construction of a multiple use hard surfaced path and a pedestrian-only soft surfaced path with lighting and benches.

The estimated cost of the Prince Memorial Greenway project is approximately $5.0 million. Of this amount $3.0 million is being funded by the Prince Trust Fund and $2.0 million is being funded by the Santa Rosa Redevelopment Agency. A contract has been awarded for the design of the project and construction is

[553]Ibid., 157.

[554]City of Santa Rosa. Request for Proposals, Prince Memorial Greenway along Santa Rosa Creek, 1996, 1, 2.

planned to occur in 1997.[555]

Santa Rosa Creek Greenway

The Santa Rosa Creek Greenway project consists of creek restoration and greenway development along Santa Rosa Creek between Santa Rosa Avenue and Mission Boulevard. The project includes land acquisition and creek restoration. Acquisition includes park sites, linear strips along Santa Rosa Creek, and an access from Montgomery Drive near Summerfield Road to the creek.[556]

The acquisition cost is estimated at $1.4 million which is being funded by the Sonoma County Agricultural Preservation and Open Space District. Acquisition is currently underway.[557]

SANTA ROSA WATERWAYS PLAN

The Santa Rosa Waterways Plan was adopted by the Santa Rosa City Council in April 1996. The purpose of the Waterways Plan is to provide guidelines, policies and criteria for the protection, care, management, restoration and enhancement of waterways within the City of Santa Rosa. The Waterways plan addresses three different aspects of managing or protecting waterways:[558]

- The plan provides guidelines for protecting and managing waterways. In many places where creeks are in a relatively natural condition, they are on private property. In these areas property owners are responsible for the condition of the creek.

- The plan sets forth policies for development adjacent to waterways. It discusses how to incorporate waterways into new development projects adjacent to creeks; utilizing best management practices to reduce impacts on water quality; establishing waterway setbacks and buffers between

[555]Frank Kasimov, City of Santa Rosa Department of Community Development, personal communication on July 29, 1996.

[556]City of Santa Rosa, Competitive Matching Grant Program (Application), 1996, 1.

[557]Frank Kasimov, City of Santa Rosa Department of Community Development, personal communication on July 29, 1996.

[558]City of Santa Rosa. Santa Rosa Waterways Plan, April 1996, 1, 2.

development and waterways; providing design strategies that protect waterways; creating recreational uses adjacent to waterways; and implementation strategies.

- The plan sets forth policy guidelines for protecting the ecological integrity of waterways while continuing to minimize the risk of flooding.

Brush Creek Restoration Project

The Brush Creek Restoration Project was carried out early in 1996. The purpose of the project is to restore the fisheries habitat functions and values to a portion of the Santa Rosa Creek watershed which underwent channelization during the 1960's. The project involves the 1.5 miles of Brush Creek immediately upstream from its confluence with Santa Rosa Creek.[559]

Brush Creek is in a natural condition in its upper reaches and is a fine steelhead trout habitat, but the good habitat is separated from Santa Rosa Creek by the 1.5 channelized reach. This reach, without a riparian canopy, warms to a temperature which constitutes a thermal barrier to migrating steelhead.[560]

Seventeen species of trees and shrubs were planted along both sides of the 1.5 mile reach of the creek. The project was divided into 31 sections, classified as shaded section and open sections. The trees were planted two deep, in two staggered rows between the mid-bank and upper-bank. Consideration was given to existing woody vegetation, clustering, cross-sectional shape and creek orientation.[561]

The Sonoma County Water Agency, in coordination with Sonoma County Releaf, a non-profit organization, assembled the revegetation team. The Agency provided a crew of 31 section leaders and Sonoma County Releaf organized approximately 220 elementary and high school students from four area schools. The planting occurred during February and March 1996.[562]

The materials and planting plan cost approximately $25,000

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[559]David M. Mattens, National Oceanic and Atmospheric Administration. Brush Creek Restoration Project Progress Report, March 1996, 4.

[560]City of Santa Rosa, Project Proposal for NMFS Restoration Center; Brush Creek, City of Santa Rosa, California, May 1995, 2.

[561]Mattens, Brush Creek Progress Report, 4.

[562]Ibid., 4 through 6.

which was funded by a National Marine Fisheries Service grant.[563]

LAGUNA DE SANTA ROSA PARK MASTER PLAN

The Laguna de Santa Rosa Park Master Plan was adopted by the City of Sebastopol in 1992.[564] It was incorporated into the City's general plan in November 1994. The plan addresses many recreational, environmental, development, and resource management issues that affect the Laguna. Programs are established by the plan to protect, preserve and enhance the Laguna while recognizing and incorporating recreational and commercial development necessary for the social and economic well-being of the community. The plan recognizes that the Laguna is an regional ecosystem and includes areas both inside and outside Sebastopol in the plan.[565]

[563]Ibid., 4.

[564]Hyden Associates Landscape Architecture and Golden Bear Biostudies. City of Sebastopol Laguna de Santa Rosa Park Master Plan, 1992.

[565]City of Sebastopol. General Plan, November 1994, III-20.

Chapter VIII, Flood Control

The principle flood control activities within the Russian River basin are carried out by the Sonoma County Water Agency and are financed by Zone 1A. As noted in Part 1, Chapter VIII, a geographical zone, designated Zone 1A, encompassing the Mark West Creek-Laguna de Santa Rosa watershed was formed under the authority of the Sonoma County Water Agency's enabling legislation. The purpose of Zone 1A is to finance the construction of flood control and drainage facilities, the clearing of natural waterways, the preparation of master drainage plans for areas subject to flooding, and erosion and sediment control activities. The zone also finances the flood control operation and maintenance activities of the Agency, which include planting, pruning, spraying, fertilizing and irrigating channel landscaping; fencing; mowing to eliminate fire hazards; structural repair; grading and reshaping of channels; and spraying using herbicides approved by the County Agricultural Commissioner to control undesirable vegetation.[566]

In November 1986 the electorate of Zone 1A zone authorized the levying of benefit assessments within the zone to augment funds which the zone receives from the general property tax. While the property tax revenues received by the zone are adequate to maintain existing facilities, they are insufficient to support any significant construction of new facilities. The authorization of benefit assessments terminates with fiscal year 1996-1997. In August 1996 the Board of Directors of the Agency authorized placing a proposition on the November 1996 consolidated election ballot to authorize continued benefit assessments in Zone 1A.[567]

The flood control projects which may be funded by Zone 1A with continued benefit assessments are shown in Table 3-VIII-1.[568]

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[566]Sonoma County Water Agency. A Report to the Board of Directors of the Sonoma County Water Agency on Benefit Assessments for Flood Control Purposes within Flood Control Zones 1A and 2A, July 1996, 1.

[567]Sonoma County Water Agency, Resolution of the Board of Directors Determining and Proposing Continued Annual Assessments on Each Parcel of Real Property Within Flood Control Zone 1A, Calling a Special Election on the Proposition Within Zone 1A and Requesting Consolidation of said Election with the General Election Called for November 5. 1996, Resolution No. 96-1039. August 6, 1996.

[568]SCWA, Report on Benefit Assessments within Zone 1A, 5.

Table 3-VIII-1

Flood Control Project Needs in Zone 1A

Airport Creek
Blucher Creek Project
Calder Avenue/Main Street Extension
Cameron Creek
Carr Avenue Conduit
Chico Avenue Conduit
Cleveland/Harrison Storm Drain
Coffey Creek
Colgan Creek Channel Revegetation
Columbo Avenue Project
Copeland Creek
East Windsor Creek
Fairgrounds Project
Farmers Lane Extension Diversion Conduit
Forestview Creek
Fulton Creek
Grant Creek
Gumview Creek
Hampton Court Project
Hartman Creek
Highway 12 East Project
Laguna de Santa Rosa (Stony Point Road)
Laguna de Santa Rosa ("D" line No. 2, Phase II)
Manzanita Creek Conduit
Matanzas Creek
McMinn Avenue Project
Naval Creek Conduit and Channel Improvements
Olivet Creek
Peterson Creek
Piner Creek Conduits
Pruitt Creek
Redwood Creek
Santa Rosa/Todd Avenue Project
Sotoyome Creek
South Santa Rosa Avenue Conduit
South Wright Road Conduit
Spivoc Creek and Bypass
Standish Avenue Conduit
Starr Creek
Upper Brush Creek Tributaries
Upper Kawana Creek
Upper Piner Creek
Upper Roseland Creek
Upper Todd Creek
Wendel Creek
West College Avenue Project
Woolsey Creek

The design criteria of the Agency classifies waterways into several categories. These categories are 1) natural waterways; 2) landscaped constructed waterways; 3) closed conduits; and 4) constructed channels.[569]

Natural waterways which have sufficient waterway area to contain design discharge and which are reasonable stable, or which may be stabilized with minor channel modifications, may be left in their natural condition. Natural waterways may be fenced with rail fencing or other architectural designed fencing.[570]

Landscaped constructed waterways are natural waterways which are enlarged and/or realigned, but for which landscaping, planting, irrigation, or other aesthetic treatment is provided to enhance the appearance and habitat value of the waterway. As in the case of natural waterways, landscaped constructed waterways may be fenced with rail fencing or other architectural designed fencing.[571]

Waterways whose design flow may reasonable be conveyed in a 72-inch diameter or smaller concrete pipe are placed underground in a closed conduit, except for natural waterways, landscaped constructed waterways, and street and highway drainage facilities.[572]

Constructed waterways generally follows the existing waterway alignment except where bank stability, property constraints or environmental considerations dictate an alternate design. Constructed waterways are often designed as a bypass facility with an alignment generally paralleling the meander of the existing waterway. The natural waterway carries a flow within its natural capacity with the bypass carrying the excess. This allows the preservation of the habitat and aesthetic values of the natural waterway without periodic flooding. Constructed waterways can also be enlarged with construction occurring only on one side. This allows the preservation of some of the habitat and aesthetic values of the waterway when right-of-way or other constraints prohibit a bypass.[573]

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[569]Sonoma County Water Agency, Flood Control Design Criteria, August 1983, 1 through 8.

[570]Ibid., 5.

[571]Ibid., 6.

[572]Ibid., 8.

[573]Ibid., 23.

The Agency has adopted best management practices for the maintenance of it flood control facilities. These maintenance methods provide an alternate range of techniques for accomplishing maintenance tasks. The methods vary from very low impact hand labor in some instances, to the operation of heavy equipment within waterways under certain specified conditions. This range of alternatives allows the selection of the method appropriate for each maintenance situation with maximum consideration of the environmental impacts of the maintenance activities.[574]

[574]Sonoma County Water Agency, Maintenance Methods and Best Management Practices, February 1996.

Part 4, Analysis and Recommendations
Chapter I, Comprehensive Planning Needs

INTRODUCTION - PUBLIC LAW 100-653

In the preface it was noted that concerns about the condition of the Russian River have been accompanied by calls for the development of a comprehensive management plan. In 1988 the U.S. Congress enacted Public Law 100-653. This act authorized the expenditure of $2.0 million to study the fishery resources of the Russian River. Under this law, The U.S. Fish and Wildlife Service is to be the lead agency and is to enter into a memorandum of understanding with the U.S. Army Corps of Engineers to set forth each agency's respective role in the study. The California Department of Fish and Game (CDFG) is to be invited to participate, providing the Department pays for one-third ($1.0 million dollars) of the estimated cost of the study.[575]

The purposes of this study are defined in the legislation to be as follows:[576]

- Develop goals and short and long term recommended actions for restoration and conservation of fishery resources and habitats.
- Provide to Congress a report on the recommended goals and actions.

The study is to include, but is not limited to, the following:[577]

- Description of fishery resources and habitats.
- Description and analysis of the river basin.
- Historical account and analysis of fishery resources and habitats.
- Evaluation of the information developed.

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[575]102 U.S. Statutes 3831

[576]Ibid.

[577]Ibid.

- Definition of the federal, state and local roles.

Although the Russian River study is authorized, no money has been appropriated to carry out the study.

RUSSIAN RIVER SALMON AND STEELHEAD TROUT RESTORATION PLAN

As noted in Part 3, Chapter V, the State Legislature, in the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act, adopted in 1988, declared that CDFG shall develop a plan and program that strives to double the current natural production of salmon and steelhead trout resources.[578] In response to this mandate, CDFG has developed a draft Russian River Salmon and Steelhead Trout Restoration Plan. The draft plan includes the following:[579]

- Background information on the anadromous species in the Russian River system including life history, population status, importance of resource, and factors depressing population.
- Review of various federal and state acts and California Fish and Game Commission policies which will affect the new restoration program.
- Presentation of environmental problems and a discussion of preferred actions to alleviate problems and restore populations.
- Discussion of implementation of the restoration program.
- Discussion of coordination needed with other government agencies, conservation groups, and developer interests to carry out the restoration program.

Although geographically specific to the Eel River, CDFG has also developed a draft Eel River Salmon and Steelhead Restoration Action Plan which includes extensive information that also may be

[578]California Fish and Game Code, Division 6, Part 1, Chapter 8, commencing at Section 6900.

[579]California Department of Fish and Game. Russian River Salmor and Steelhead Trout Restoration Plan (Draft), March 1991. 2.

applicable to the Russian River.[580]

SWRCB RUSSIAN RIVER STRATEGY

As noted in Part 3, Chapter I, in May 1995 the State Water Resources Control Board (SWRCB) adopted a strategy for dealing with pending water rights issues in the Russian River basin. In addition to the phases described in Part 3, Chapter I, this strategy includes a fifth phase. That phase consists of assisting in developing a comprehensive Russian River watershed management plan.[581]

The Division of Water Rights staff report observed that there is broad public support for developing a Russian River watershed management plan that would include participation by all "major players". This process could integrate on-going studies, as well as new studies. The staff observed that the development of a basin-wide management plan would have several advantages in that it could:[582]

- define issues, problems, goals, and objectives to provide for optimum use of the water resource.
- provide a pool of available information.
- determine studies that are needed.
- develop strategies to address problems.
- allow for participation by all interested parties.
- provide a forum for development of negotiated solutions.

The staff stated that development of a basin-wide management plan would require consideration of numerous issues and would involve numerous agencies with regulatory authority. In addition, substantial time, studies, resources, funds and staff would be required. Currently, the Division does not have sufficient resources or authority to develop such a watershed

[580]California Department of Fish and Game. Eel River Salmon and Steelhead Restoration Action Plan, March 1996.

[581]SWRCB, Division of Water Rights. Staff Report, Russian River, 6.

[582]Ibid., 8.

management plan.[583]

The Division of Water Rights staff report identified the following approaches which could be used to develop a basin-wide management plan:[584]

- The SWRCB could take the lead role by preparing a Water Quality Control Plan for the Russian River watershed or by amending the North Coast Regional Water Quality Control Board basin plan. Under this approach, other agencies, such as the Sonoma County Water Agency and CDFG could prepare major components of the plan.

- Other agencies could take the lead in developing a basin-wide management plan. The plan could integrate several on-going programs, including the State Conservation Conservancy study, the Regional Board study, certain litigation being pursued by the State Lands Commission, CDFG studies, and potential actions by the National Marine Fisheries Service under the Endangered Species Act.

- The California Resources Agency's Framework Agreement for Cooperation in Coastal Salmon Natural System Conservation could lead to the development of a basin-wide management plan. The Division staff report states that the Resources Agency appears willing to act as a facilitator to help coordinate the activities of the other agencies related to the Russian River. The need for the formation of a more formal body could be evaluated after the initial efforts of coordination have been established.

CALIFORNIA RESOURCES AGENCY FRAMEWORK AGREEMENT

The Framework Agreement is an agreement between the California Resources Agency, the National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Resources Conservation Service, California Department of Fish and Game, Fish and Game Commission, California Department of Forestry, State Board of Forestry, Region IX of the U.S. Environmental Protection Agency, Bureau of Land Management, State Water Resources Control Board, North Coast Regional Water Quality Control Board, State Coastal Conservancy and the Yurok Tribe for cooperation in coastal salmon natural system conservation. The stated purpose of the agreement is to establish a partnership

[583]Ibid.

[584]Ibid., 9.

between the signatories to conserve the rich and unique biological diversity of the coastal salmon natural systems and to maintain a healthy and sustainable economy. This effort is to be developed within the framework of the existing legal authorities of the parties to the agreement.[585]

The Framework Agreement includes the following policy statements:

- A commitment to promoting maximum coordination, communication, and cooperation among the state, local tribal and federal agencies with interests and responsibilities in the coastal salmon waterways.

- A commitment to meeting the requirements of state, local, tribal and federal law in a manner that considers how the overall costs for achieving environmental protection can be minimized.

- An agreement that a major goal of all regulatory processes affecting the coastal salmon waterways should be to provide meaningful regulatory stability for beneficial uses of the waterways' resources and that the best way to attain that goal is to develop a single, cohesive program, consisting of appropriate actions, including continuing planning efforts, that meet all requirements of law and which will remain in effect for a period of years.

- An agreement that a primary component of providing regulatory stability is to integrate current and future implementation of the Federal and State Endangered Species Acts, the State's Porter-Cologne Water Quality Control Act, the Federal Clean Water Act and other applicable laws, into a coordinated approach to resource management.

NATURAL HERITAGE INSTITUTE REQUEST

As noted in the preface, the Natural Heritage Institute, a law and consulting firm in resource conservation, in a June 1996 letter to Gray Davis, Chairman of the State Lands Commission, James M. Strock, Secretary for Environmental Protection, and Douglas P. Wheeler, Secretary of the California Resources Agency, acting on behalf of the Friends of the Russian River, another river conservation organization, asked the State to adopt a plan for long-term management, including restoration, of the Russian

[585]Framework Agreement for Cooperation in Coastal Salmon Natural System Conservation.

River fisheries and their habitat. This letter asked the State to take the following actions:[586]

- o Prevent further degradation of the anadromous fisheries of the Russian River incident to new or amended uses of public trust lands and waters.

- o Adopt a plan for long-term management, including restoration, of the fisheries and their habitat.

- o Review permits, licenses, and other approvals for existing uses to determine which may be inconsistent with applicable laws for protection of the fisheries, and then amend such approvals as appropriate.

The Institute letter informed the State that American Rivers, Inc. joins in the letter and intends to join in any litigation if negotiations to secure the requested State actions fail.[587]

[586]Natural Heritage Institute, Public Trust Resources of the Russian River, letter dated June 5, 1996, 5.

[587]Ibid., 7.

Chapter II, Need for Comprehensive Management Plan

Many effective ongoing planning processes already exist within the Russian River basin. In addition to the California Department of Fish and Game's draft Russian River Salmon and Steelhead Trout Restoration Plan described in this chapter, and their Russian River Planning and Restoration Process described in Part 3, Chapter V, there also exists the basin planning process and the Bodega/Russian River Watershed Management Area strategy of the North Coast Regional Water Quality Control Board which is discussed in Part 3, Chapter II. Other ongoing planning processes include the Urban Water Management Plan process carried out by the Sonoma County Water Agency under the California Urban Water Management Planning Act;[588] the Aggregate Resources Management Plan process described in Part 3, Chapter IV; the Public Access & Trespass Management Plan process being carried out by the State Coastal Conservancy; and the comprehensive general planning processes of the cities and counties carried out under the Planning and Zoning Law discussed in Part 2, Chapter I.

While the concept of a comprehensive Russian River basin management plan is appealing in its simplicity, the practicalities involved in developing such a plan are daunting. In addition, the cost of such an effort would be enormous, and would consume public funds which, at least in some instances, otherwise could be invested in implementation measures. The preparation and approval of a comprehensive management plan would take years. A very real danger would exist that the plan would be out of date before it could be published.

The Division of Water Rights staff report identified three possible approaches for developing a Russian River basin management plan. If an effort to develop a plan should be undertaken, the California Resources Agency's Framework Agreement approach has the most merit. The stated goal to promote maximum coordination, communication, and cooperation among the state, local, tribal and federal agencies with interests and responsibilities in the waterways is absolutely essential to the success of any planning process for the Russian River basin. This is equally true whether the planning process consists of a single comprehensive one, or the several existing processes which are ongoing.

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[588]California Water Code, Division 6, Part 2.6, commencing at Section 10610.

Chapter III, Need for Interagency Communication, Communication and Coordination

Regardless of whether or not the development of a single comprehensive Russian River basin management plan is undertaken, one agency should assume the responsibility to promote coordination, communication and cooperation among all of the state, local, tribal and federal agencies with interests and responsibilities in the Russian River and its tributaries. Due to its historic management role with respect to the Russian River, the most appropriate agency is probably the Sonoma County Water Agency, although other existing agencies, or a new agency, could effectively assume this role. The coordination, communication and cooperation effort should include at least the following:

1. The publication and circulation among all involved government agencies of a newsletter, at least as frequently as quarterly, describing proposed new programs, legislation and rule-making affecting or involving the Russian River, and the status of existing, ongoing programs.

2. The sponsorship of a one or two day symposium on the Russian River, to be held every two years, at which agencies involved in studies and projects affecting the Russian River could present the results of their efforts.

3. The periodic preparation and publication of a guide to financial assistance for studies, restoration and enhancement programs which would identify potential sources of public and private financial assistance and the requirements and conditions of such assistance.

4. The preparation of a status report on the condition of the Russian River, at least as frequently as once every five years. The report could take the form of Part 1 of this document, or could be in any other appropriate form.

5. The identification of program or other action needs, formulation of program specifications, and identification of appropriate agencies or other entities to implement the programs or actions identified as needed.

Chapter IV, Program Needs

INTRODUCTION

As noted in the preface, one of the purposes of this study is to identify any problems which are not currently being adequately addresses in order to facilitate the rational allocation of the resources which are available, or which may become available in the future. In the course of describing the condition of the Russian River in Part 1 and the current programs in Part 3, a number of program needs became evident. These are identified in this chapter. In general, no attempt has been made to formulate the program specifications or identify the specific governmental agency or agencies which should undertake the identified program needs. This is one of the coordination, communication and cooperation efforts recommended to be undertaken in Part 4, Chapter III.

WATER SUPPLY

As noted in Part 3, Chapter I, the Sonoma County Water Agency regulates the flow of the Russian River for the benefit of agriculture, municipal and instream uses within Mendocino and Sonoma Counties. The Agency has entered into agreements with several Mendocino and Sonoma County governmental agencies which authorize the diversion or rediversion of water by those agencies under appropriative water rights owned by the Agency. There are, however, two municipal water systems which need, but do not currently have, such agreements. These are the systems operated by the City of Cloverdale and the Geyserville Water Company. Agreements need to be negotiated between these entities and the Agency and applications need to be filed with the State Water Resources Control Board for a change in point of diversion under the Agency's appropriative water rights permits.

A similar situation exists in Dry Creek Valley with respect to agricultural users. As noted in Part 1, Chapter I, current lower Dry Creek agricultural water demand is approximately 3,500 acre-feet per year and is projected to increase to 3,812 acre-feet by 2015. During most, if not all, summers and under certain conditions during other seasons as well, the only significant quantity of water in Dry Creek available for diversion is that released from storage in Lake Sonoma by the Agency. The Agency holds the exclusive appropriative water rights to that water. A water district needs to be formed to contract with the Agency for the water used by agriculture in Dry Creek Valley and to report the quantities of such water use. A petition would also have to

be filed with the State Water Resources Control Board to change the Agency's points of diversion in this instance.

WATER QUALITY

As noted in Part 1, Chapter II, there are many documented substandard or failed individual septic systems in the Camp Meeker, Mirabel Heights, Monte Rio, and Summerhome Park communities in Sonoma County and suspected substandard or failed systems in the Odd Fellows Park, Hacienda, Hollydale and Rio Dell communities. Either these substandard or failed systems need to be abated, or community Wastewater facilities to serve these communities need to be constructed.

RECREATION

A number of unmet recreation needs were identified in Part 1, Chapter III. Some of these needs are being addressed with current projects. These are described in Part 3, Chapter 3. The recreation projects which are hot currently being addressed, but which need to be developed, are as follows:

1. Acquisition and construction of public access for canoe launching and landing along the Russian River from the Sonoma-Mendocino County line to Healdsburg in Sonoma County. Access sites are needed every six to nine miles with minimum sanitation, toilet and parking facilities.

2. Development of recreation sites at Comminsky Station Road south of Hopland and at Riverside Park (Gobbi Street) in Ukiah, both in Mendocino County.

3. Development of the full recreational potential of Lake Sonoma. As noted in Part 1, Chapter III, only 45% of the campsites and about half of the trail mileage proposed in the Lake Sonoma Master Plan has been developed.

GRAVEL MINING

Historic gravel mining has contributed to the major river bed degradation along certain reaches of the Russian River. These geomorphologic impacts are described in Part 1, Chapter IV. As noted in Part 3, Chapter IV, Sonoma County in 1994 adopted a new Aggregate Resources Management Plan and is currently implementing it. One of the major objectives of Sonoma County's program is to maintain a balance between aggredation and

degradation of the Russian River bed which reflects the natural recharge of aggregate. A critical element of this program is effective monitoring.

No similar program currently exists in Mendocino County. There is a need for the development of an aggregate resources management plan and implementing measures for Mendocino County, including an effective monitoring program.

FISHERY

As noted in Part 1, Chapter 5, a serious decline in the population of salmonids has occurred in the Russian River and other west coast streams. While the causes of this decline are many, complex, and not completely understood, it is clear that an effective restoration program must address the three major dimensions of 1) hatcheries, 2) harvest, and 3) habitat. While the first two of these dimensions fall almost exclusively under the jurisdiction of the federal and state government, local government can, and must, play an important role with respect to the third. In this regard there is a need for the following:

1. Expansion of the programs of the resource conservation districts and other agencies providing technical assistance and incentives for private landowners for watershed management and restoration on their land in both Sonoma and Mendocino Counties.

One of the salmonid abundancy determinants identified in Part 1, Chapter V is inadequate water diversion screening. In this regard there is a need for the following:

2. Installation of fish screens meeting California Department of Fish and Game criteria on all water diversion intakes along the Russian River and its tributaries where salmonids are present.

BARRIERS TO MIGRATION

Another of the salmonid abundancy determinants identified in Part 1, Chapter V is barriers to migration. A number of barriers to migration of salmonids were identified in Part 1, Chapter VI. While it is not practical to remove or mitigate the impact of many of these barriers, the following measures are clearly feasible and need to be taken:

1. Completion of Healdsburg Dam fish passage device CEQA process currently being performed by the California Department of Fish and Game, and negotiation of *a* contract between Sonoma County and the Sonoma County Water Agency providing for the construction of the fishway described in Part 3, Chapter VI.

2. Installation of a fishway at the Del Rio Woods Recreation and Park District dam in Sonoma County at the time the Healdsburg Dam fishway is installed.

3. Installation of a fishway at the Willow County Water District rubble dam in Mendocino County.

4. Installation of the Matanzas Creek fishway described in Part 3, Chapter VI.

5. Implementation of the Russian River Estuary Management Plan described in Part 3, Chapter VI.

RIPARIAN HABITAT

Another salmonid abundancy determinant, described in Part 1, Chapter VII, is riparian habitat. With regard to this determinant, the following measures need to be taken:

1. Expansion of Russian River tributary riparian habitat restoration programs described in Part 3, Chapter V currently being undertaken by the California Department of Fish and Game and the Sonoma County Water Agency.

2. Development of a comprehensive Russian River basin-wide riparian zone vegetation protection and restoration program in both Sonoma and Mendocino Counties, financially supported by the Sonoma County Agricultural Preservation and Open Space District in Sonoma County, and by the establishment of an agricultural preservation and open space district in Mendocino County.

FLOOD CONTROL

As noted in Part 3, Chapter VIII, a number of unmet flood control needs have been identified in the urbanized Mark West Creek-Laguna de Santa Rosa watershed. In Part 1, Chapter VIII it is noted that no benefit assessment zones have been established in the Russian River watershed in Mendocino County. While the only identified flood control need in this area is the removal of auto bodies along the Russian River, a number of other unmet

flood control needs undoubtedly exist in the urbanized portion of this area. In this regard, the following measures need to be taken:

1. Securing of the reauthorization of benefit assessments in the Zone 1A, Mark West Creek-Laguna de Santa Rosa flood control zone described in Part 3, Chapter VIII.

2. Development of a program to secure the removal of auto bodies and the restoration of the 3500 linear feet of Russian River banks in Mendocino County currently protected from erosion with auto bodies.

3. Establishment of benefit assessments to finance the removal of auto body bank protection and other unmet flood control needs in the urbanized portion of the Russian River watershed in Mendocino County.