Upper Feather River Watershed (UFRW)
Irrigation Discharge Management Program

Irrigated Agricultural Practices in UFRW

SWRCB Agreement 04-317-555-0

Regents of the University of California

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Photo: Andrea Oilar

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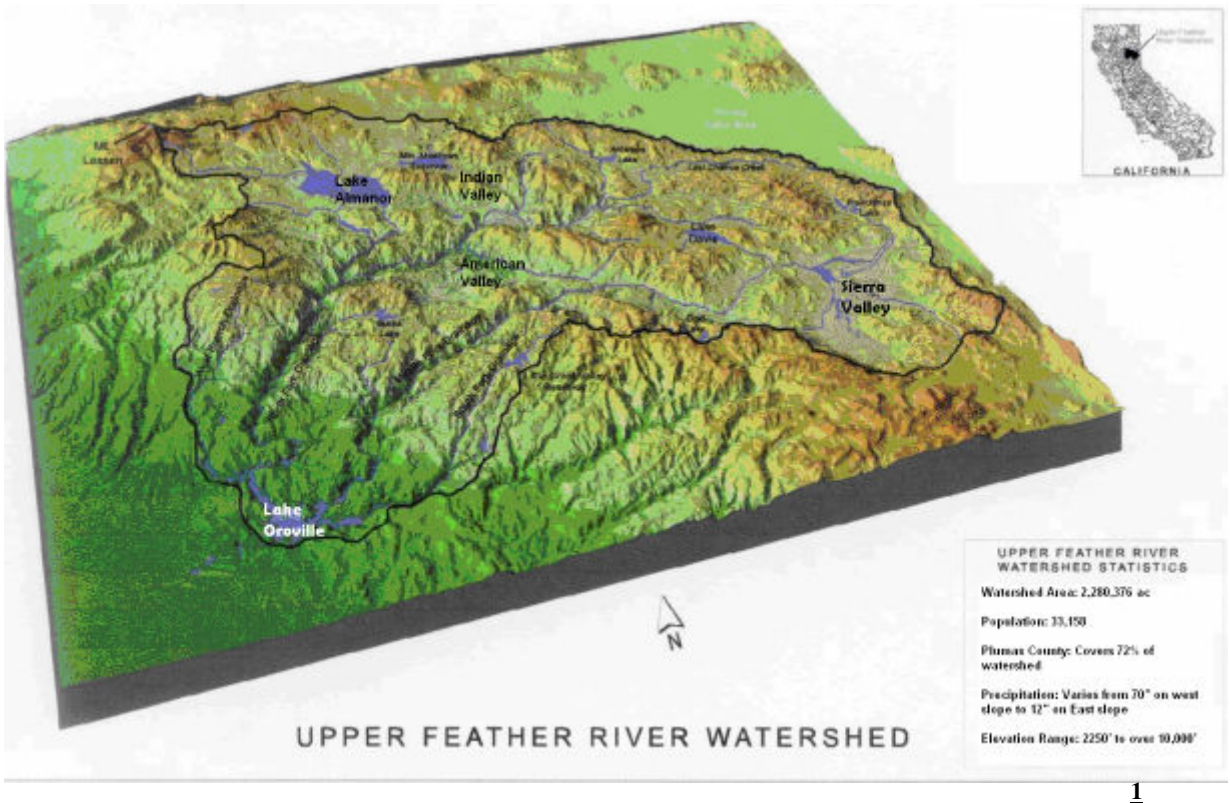


[1]

Upper Feather River Watershed Overview

The Feather River watershed is located in California's northern Sierra Nevada and encompasses 3,222 square miles of land that drains west from the northern Sierra Nevada into the Sacramento River. The Feather River is unique in that the two branches, the North and Middle Forks, originate east of the Sierra Range in the Diamond Mountains and as these two forks flow west, they breach the crest of the Sierra Nevada Range on their way to Lake Oroville. Elevation ranges from 2,250 to over 10,000 feet, and annual precipitation varies broadly from more than 70 inches on the wet western slopes to less than 12 inches on the arid east side. Vegetation is diverse and ranges from productive mixed conifer and deciduous forests in the west to sparse sage/yellow pine plant communities in the east. The U.S. National Forest Service manages over 80 percent of the watershed, while alluvial valleys are predominantly privately owned and used for livestock grazing and hay production.

The Upper Feather River Watershed (UFRW) is defined as the portion of the North Fork Feather River Watershed upstream of the confluence of Indian Creek and the North Fork Feather River (including the Indian Creek sub-basin), and the Middle Fork Feather River Watershed above Portola, CA. The waters of the UFRW (Middle and North Forks Feather River, Indian Creek, Spanish Creek, Greenhorn Creek, Goodrich Creek, and their tributaries) are important for recreational, fishery, and aquatic habitat benefits, in addition

[1] Map from the Integrated Regional Watershed Management Plan by the Feather River Watershed Authority (http://www.countyofplumas.com/publicworks/watershed/IRWMP_063005.pdf)

to contributing to local and state supplies for agricultural, industrial, and municipal uses. There are approximately 60,000 irrigated agricultural acres in UFRW[2].

The 2002 Agricultural Crop report estimates approximately 160,100 acres of pasture and hay crops are grown in Plumas and Sierra Counties with 15,000 head of cattle. Irrigation on private lands takes place principally within the three large valley areas: 1) **Sierra Valley** which drains to the upper reaches of the Middle Fork Feather River above Portola; 2) **Indian Valley** which drains to Indian Creek near Greenville; and 3) **American Valley** which drains to Greenhorn and Spanish Creeks near Quincy. Other irrigated lands are located on **Goodrich Creek** a tributary to the East Branch of the North Fork Feather River. Irrigation also occurs on Mohawk Valley along Sulphur Creek outside of Clio/Graeagle and Long Valley along the Feather River near Cromberg/Sloat. This report provides information on the UFRW, the irrigated agriculture within each of the major valley areas, and the potential water quality problems from discharge of irrigation return flows to the Feather River, and its tributaries.

Hydrology

The Upper Feather River Watershed is divided into four main branches: the West Branch, the North Fork, the Middle Fork, and the South Fork of the Feather River. The North Fork is the largest branch in which the upper reaches are divided into two main branches: the Upper North Fork and the East Branch of the North Fork. Table 1 shows the sizes of each of the main branches of the Feather River.

Table 1 – Major River Drainage: Four major rivers in the Upper Feather River Watershed

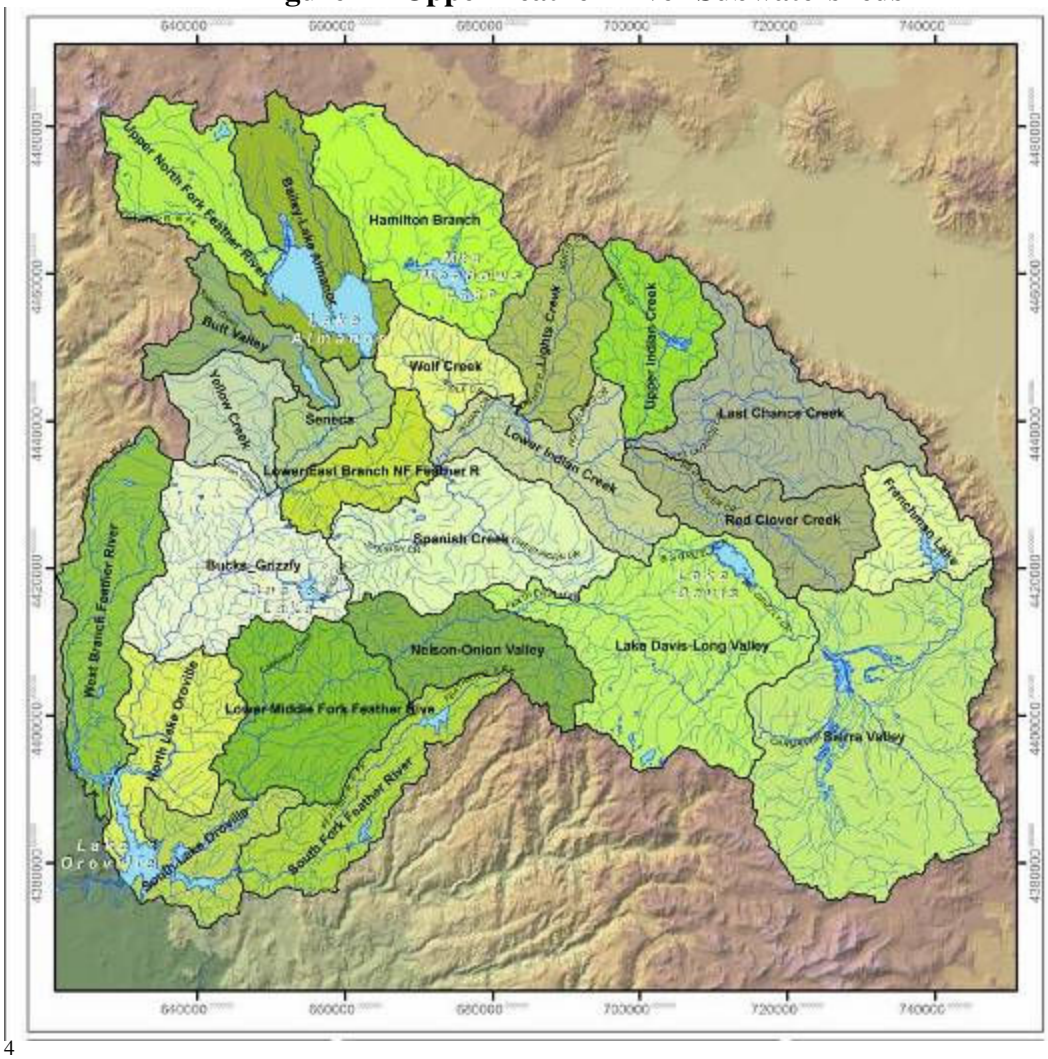
Major River Drainage	Acres	% of Watershed Area
1.North Fork Feather River	1,380,108 acres	59.82
2. Middle Fork Feather River	738,887 acres	32.03
3. West Branch Feather River	106,985 acres	4.64
4. South Branch Feather River	81,071 acres	3.51

[3]

The main branches are divided into 24 subwatersheds. The west and south branches are too small to be divided into subwatersheds. However, the Middle Fork is divided into six subwatersheds, with the North Fork divided into 17 watersheds. Figure 1 shows the locations of each subwatershed within the entire UFRW.

[2] UFRW Irrigation Discharge Management Program Monitoring Plan (March 28, 2006)
[3]Table from the Integrated Regional Watershed Management Plan by the Feather River Watershed Authority (http://www.countyofplumas.com/publicworks/watershed/IRWMP_063005.pdf)

Figure 1 – Upper Feather River Subwatersheds



[4]

[4] Map from the Integrated Regional Watershed Management Plan by the Feather River Watershed Authority (http://www.countyofplumas.com/publicworks/watershed/IRWMP_063005.pdf)

Land & Water Use

According to a 1997 California Department of Water Resources (DWR) survey there are a variety of land uses that occur in the UFRW. Agriculture is the most prominent land use and only covers 3.5% of the total 2.2 million acres in the watershed. Plumas and Sierra counties contain the most agricultural area in the watershed and as a result, Plumas and Sierra counties predict agricultural water demand in the UFRW. Plumas County covers 75% of the watershed. In Plumas County the land use is mainly field crops such as alfalfa hay, meadow hay, grain hay, irrigated pasture, and range pasture.[5] The 2005 California Agricultural Statistics Report reported the leading commodities in Plumas and Sierra counties:

TABLE 2 – PLUMAS COUNTY LAND USES		
Land Use	**Acres**	**%**
Agricultural land (irrigated & non irrigated)	46,138	2.76
Semi-agricultural lands	522.75	.03
Urban (residential, commercial, & industrial)	10,553	.63
Native Riparian	20,837	1.25
Native Water	39,189	2.34
Native Vegetation	1,554,126	93
Native Barren	189	.011
TOTAL	**1,672,696**	

- **Plumas County**: →Stocker and Feeder Cattle, Alfalfa and Wild Hay, Irrigated, Forage & Range Pasture, Beef Cattle

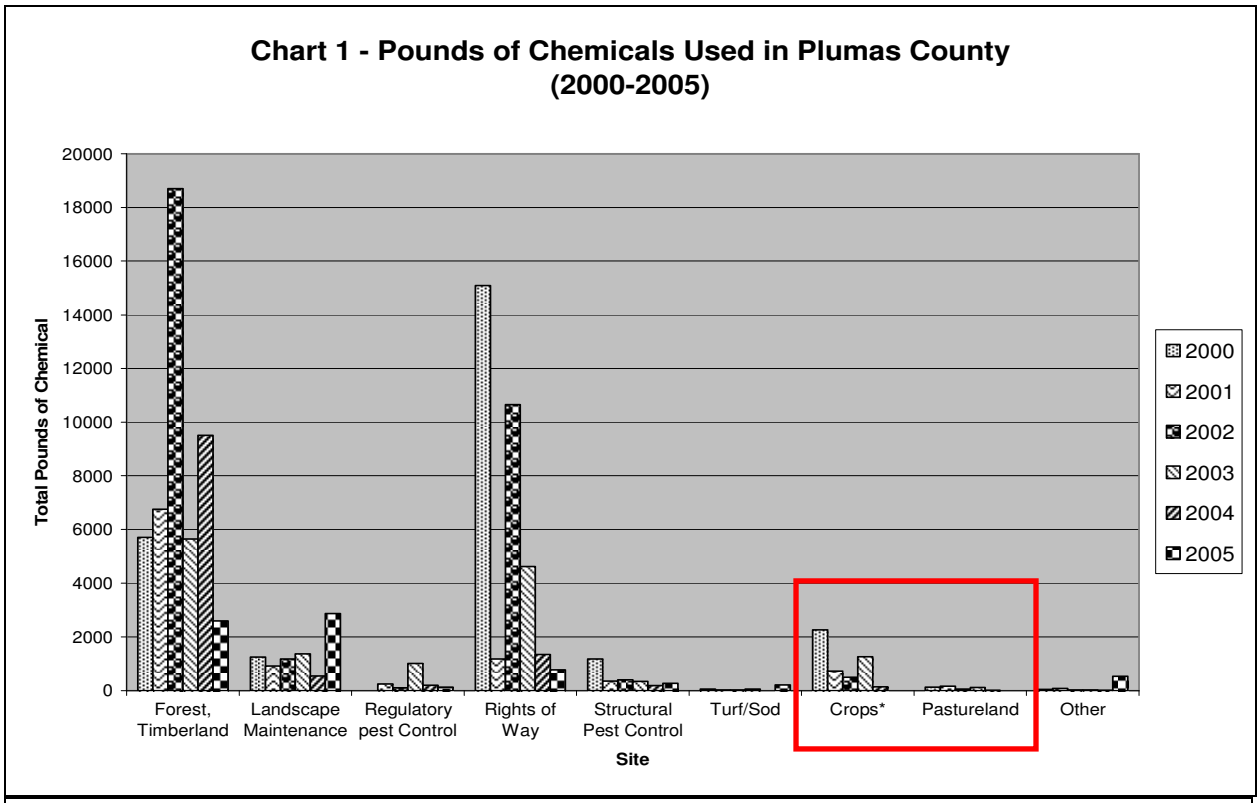
- **Sierra County**: → Stockers and Feeders, All Pasture, All Hay, Beef Cows, Fruit & Nut Crops

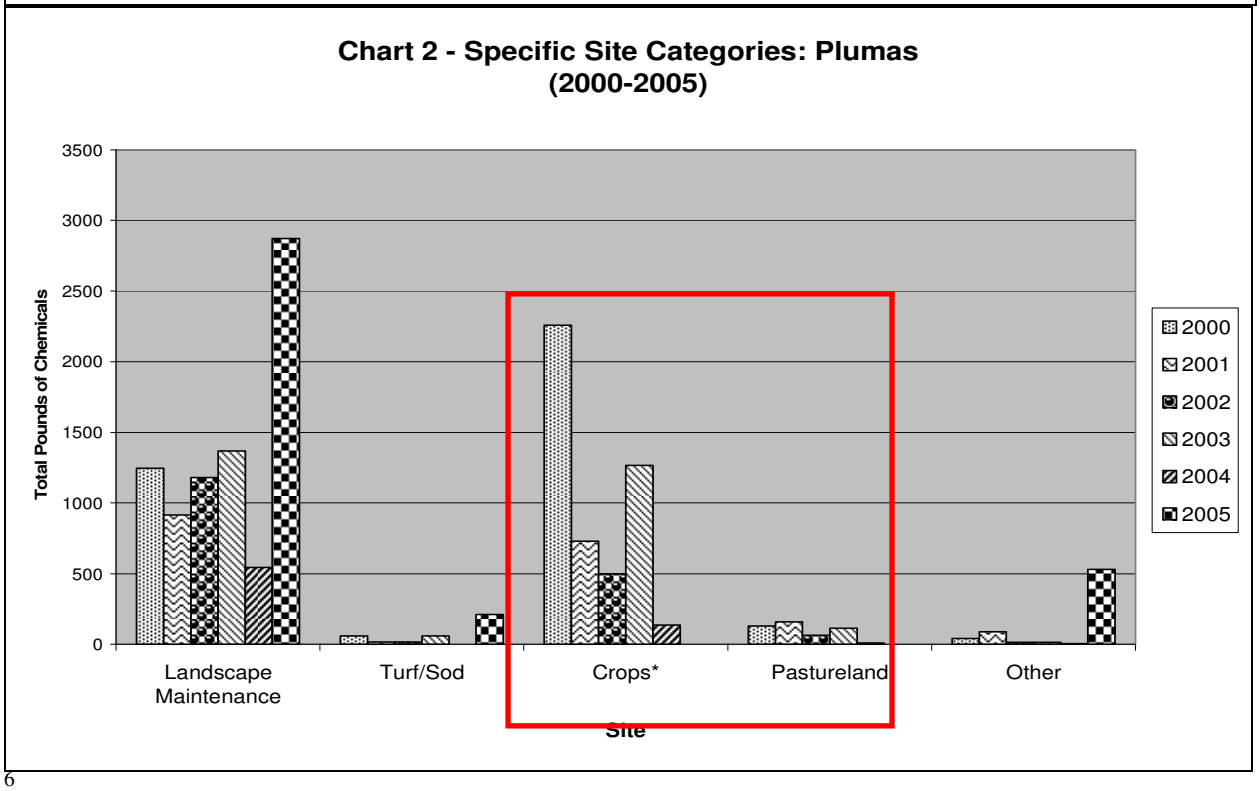
The water demand in the UFRW is for agriculture, urban, and environmental purposes. Agriculture is the most significant user of water. According to the 2005 Integrated Regional Water Management Plan, Sierra Valley watershed is the largest developed water using industry in UFRW.

Pesticide Use

According to the Department of Pesticide Regulation (DPR) report, pesticide use in Plumas and Sierra counties is extremely limited (See Chart 1, 2, 3, 4). The charts show the detailed usage for top five sites each year. Alfalfa hay is one of the main irrigated crops in the region and few pesticides are used in alfalfa hay production. Forest and timberland show the greatest amount of pesticide usage. In the spring, a common form of weed control is application of herbicides such as Velpar or Gramoxone. Pesticides are applied using ground sprayers. Roundup (glyphosate) is commonly applied around field borders and in spot treatments within the fields, with a portable backpack sprayer. For a detailed report of pesticides go to the DPR website at http://www.cdpr.ca.gov.

[5] Data from the Integrated Regional Watershed Management Plan by the Feather River Watershed Authority (http://www.countyofplumas.com/publicworks/watershed/IRWMP_063005.pdf)





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*crops include alfalfa, oat rye, and wheat

[6] Data taken from the DPR database for years 2000 through 2005
http://www.cdpr.ca.gov/docs/pur/purmain.htm

Chart 3 - Pounds of Chemicals Used in Sierra County (2000-2005)

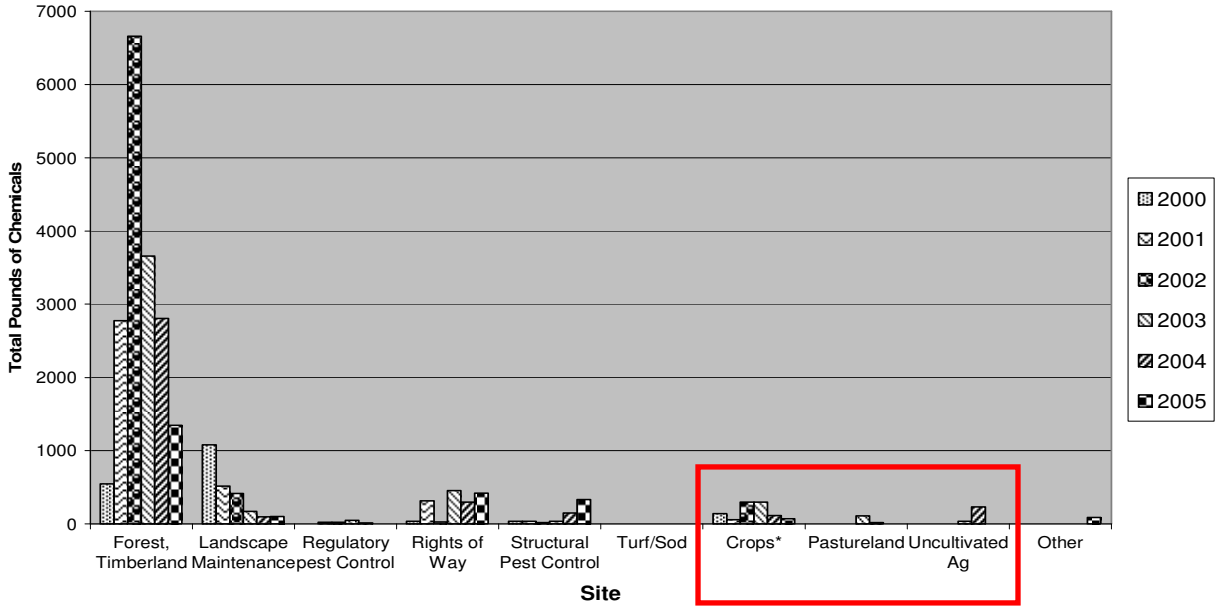
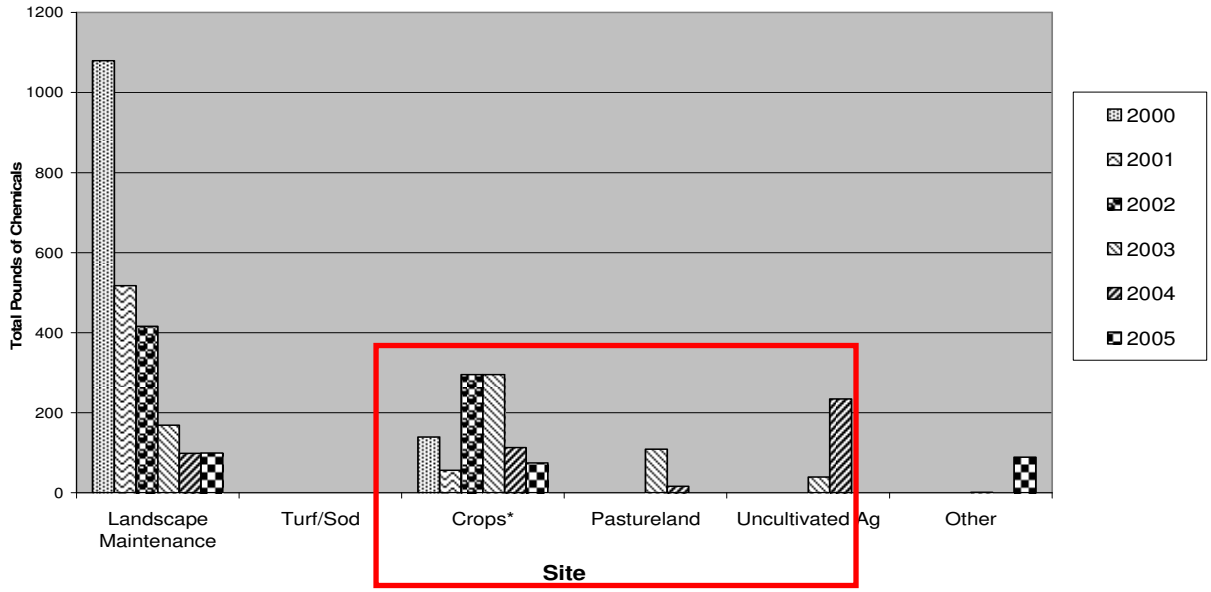


Chart 4 - Specific Site Categories: Sierra (2000-2005)



[7]

*crops include alfalfa, oat rye, and wheat

[7] Data taken from the DPR database for years 2000 through 2005
http://www.cdpr.ca.gov/docs/pur/purmain.htm

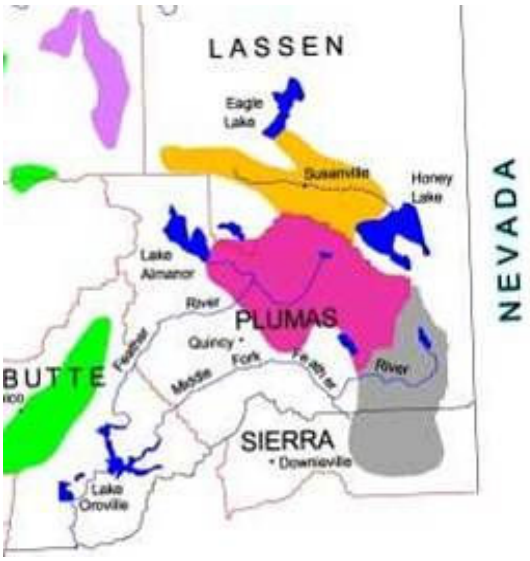
Soils

Soil data for the areas located within the UFRW can be found on the California Soil Resource Lab website (http://casoilresource.lawr.ucdavis.edu/drupal/node/27) which provides soil data for California. In addition, the National Cooperative Soil Survey (NCSS) located on the Natural Resources Conservation Service (NRCS) website (http://websoilsurvey.nrcs.usda.gov.) provides relevant soil information needed to make land-use management decisions.

Instructions for making a soil map using the NRCS website:

1. Go to **http://websoilsurvey.nrcs.usda.gov/app/**
2. Click on the **"Start WSS"** button
3. Using the soil map toolbar, click on the **zoom-in** button (magnifying glass with + sign). Move the mouse onto the map and select an area to zoom into by drag-clicking the desired area. Continue this method until you have your desired ranch, property, or area in the map view. You may also use the hand button in the map toolbar to grab and drag your map into the desired view area.
4. Once you have the map area you want, click on the **"AOI with a rectangle"** button in the map toolbar. Use this to drag-click a rectangle over your desired area. It should now be marked with blue diagonal lines; this is your "Area of Interest" or "AOI."
5. To the left of the map, you can see your AOI properties. This will tell you what area your AOI is in within your state. **Type a name** for your map, for example a ranch name or your name. You can also see the number of acres that are present in the AOI.
6. Now click on the **"Soil Map"** tab located near the top of the web page. You should be able to see orange lines and numbers in your AOI. This is your soils map. To the left of the map is a listing of the soils located in your AOI.
7. To print, click on the **"Create Printable Document"** button located on the upper right side, above the map. A small window will pop up showing "Create Printable Documents Options." If you want to change your map name, do so here. If not, **click view**. (If you have a pop-up blocker, you may have to hold the "Ctrl" button on your keyboard while you click on "View."
8. You should now see a printable map page. Scroll down and you will see a map legend page followed by a list of your soils. **Click on the print button** at the upper left of the window. *Congratulations…you have made your own customized soils map!*

Northern District Watermaster Services



Map from the Northern District Department of Water Resources
http://www.nd.water.ca.gov/PPAs/Watermasters/ServiceAreas/index.cfm

The California Department of Water Resources (DWR) website (http://www.nd.water.ca.gov/PPAs/Watermasters/) provides information regarding the watermaster services provided to the Northern District counties. The highlighted areas on the map above show the watermaster service areas in the Northern District. There is a watermaster that is responsible for each highlighted service areas. It is important to note that irrigated lands outside of these service areas are not regulated by the Department of Water Resources (DWR).

What is the watermaster program?

- Ensures that water is allocated according to established water rights
- Prevents the "waste or unreasonable use of water"
- Watermaster works full time within their service district, during irrigation season (April 1 – Sept. 30) and is responsible for regulating diversion in their area
- Watermaster will check and adjust diversions as needed (DWR 2006)

WATERMASTER SERVICES (530-832-5161)

SIERRA VALLEY

The Sierra Valley Decree #3095 which defines water rights is available at http://www.nd.water.ca.gov/PPAs/Watermasters/Decrees/SierraValley/Decree3095.

In addition there are three decree maps that are available for Sierra Valley at http://www.nd.water.ca.gov/PPAs/Watermasters/ServiceAreas/SierraValley/index.cfm.

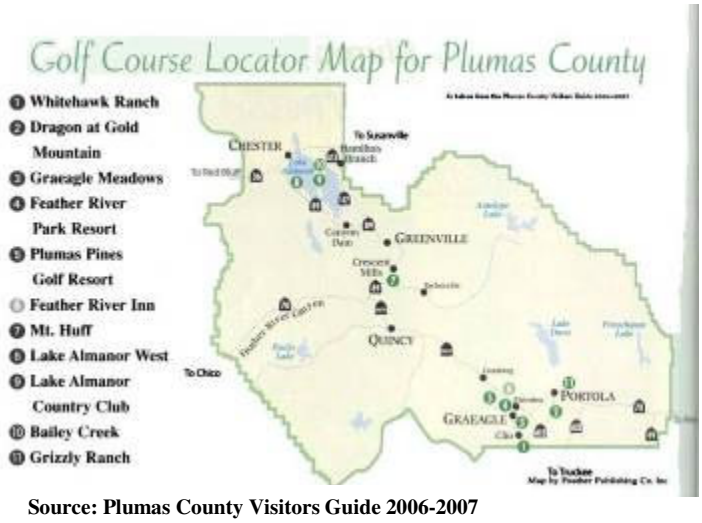
INDIAN VALLEY

The Indian Creek: Decree #4185 which defines water rights is available at http://www.nd.water.ca.gov/PPAs/Watermasters/Decrees/IndianCreek/Decree4185.pdf

In addition there are seven decree maps that are available for Indian Creek at http://www.nd.water.ca.gov/PPAs/Watermasters/ServiceAreas/IndianCreek/index.cfm

Brief History

Native Americans lived within the main valleys of the UFRW long before the white man arrived in these valleys. The Maidu Indians were the main Native American inhabitants of the American, Sierra, and Indian Valleys. Historically, Maidu villages were located in the Big Meadows area (current site of Lake Almanor), at the site of Quincy High School, and many Maidu families lived in the Indian Valley, which they called "This Place Meadow". The Maidu Indians migrated to Sierra Valley in late spring and early summer, however they did not stay for the harsh winters.[8] The Washoe Indians from the Territory of Nevada moved with hunting parties through the Long Valley, Sierra Valley, and Mohawk Valley. There is also evidence that there were settlements of the Paiute and Washoe Indians in the Long Valley area. In the 1880's-1990's, the Indians from Indian Valley would travel to Sierra Valley to work during the hay and grain harvest time. The Maidu had no written history of past, however it is believed that the Maidu and their ancestors have lived in Plumas County for thousands of years. It was after the gold rush of 1849, when white man first settled in the main valleys.[9] The American and Indian Valleys were settled by immigrants in the 1850's. It was reported that settlers first came into Sierra Valley in 1852. The demographics of the valleys have changed over time with the movement of people and changes in transportation. Historical uses of the valleys were primarily ranching and grazing, farming, mining, and logging. Today these uses continue, though they compete with growing residential, industrial, and recreational uses. One relatively recent and growing use of land is the golfing industry. In 1919, the first golf course was built within the watershed, and by 1999 there were 11 courses (with 9 having been built after 1969) with a total area of over 800 acres.



Source: Plumas County Visitors Guide 2006-2007

In Plumas County there are six "traditional" waste water treatment plants. There is one located in Beckwourth, Portola, Dellecker, Quincy, Greenville, and Chester. The "traditional" plants involve commercial treatment of waste water, which is then discharged. Newer style waste water treatment plants are utilized at developments such as Whitehawk Ranch, Grizzly Ranch, Gold Mountain, Plumas Eureka, and Walker. At these developments,

[8] Kolb, K. *Maidu Indians of Plumas County*. Plumas Unified School District & Indian Advisory Board and the Maidu People (Quincy Public Library, Closed Collections)
[9] Sinnott, J.J. (1982). *Sierra Valley – Jewel of the Sierras*. Fresno, CA: Mid-Cal Publishers

residential waste water is treated and then it is applied to land within the development[10]. One waste water treatment plant in American Valley, in Quincy, releases treated water into Spanish Creek and one in Sierra Valley releases treated water into Smithneck Creek from November to May. These facilities have discharge permits from the Regional Water Quality Control Board. In the Sierra Valley and American Valley there are at least two landowners which take waste water from these treatment plants, from May-October, and applies the water to irrigated pastures. In American Valley the treatment plant is a class 3 waste water facility, which performs secondary treatment. They are allowed to discharge from November-May 15th. The facility is required to sample daily flow and pH. In addition, weekly they sample: temperature, EOD, TSS, T coliform, DO, Fecal Coliform, pH, and turbidity. The facility is responsible for sending monitoring reports to state. They also sample up and down stream from the treatment center on Clear Creek, before it returns to Spanish Creek. During the summer, an American Valley landowner uses the discharged water for irrigation (reclaimed water). The American Valley landowner indicated that when using reclaimed water, they are prohibited from generating tail water. The water must evaporate or seep into the ground rather than running back into Spanish Creek during the summer months.[11] In Sierra Valley, Loyalton's wastewater treatment facility is an 11-year-old system. The ponds are 6-7 acres, with a discharge area of 18 acres. Dry weather flow has been reported at 100,000 gallons a day and wet weather flow 300,000-400,000 gallons per day. The city of Loyalton is permitted for 720,000 gallons a day. The facility operator has reported that groundwater table has dropped due to overdraft and well depths have gone down. It was reported that the system is in need of upgrades.[12] For additional information, visit National Pollutant Discharge Elimination System (NPDES) website: http://cfpub.epa.gov/npdes/index.cfm. In addition, Sierra Pacific Industries (SPI) in Quincy, CA (located within the American Valley) and in Loyalton, CA (located within the Sierra Valley) has a discharge permit for its sawmill operations. One Sierra Valley landowner uses wastewater from the Loyalton SPI saw mill. Information regarding water discharge permits can be obtained by zip code at the U.S. Environmental Protection Agency (EPA) website's Evirofacts Data Warehouse at http://www.epa.gov/. For example, information regarding local sewage treatment plants, refuse (dumps) sites, and sawmills may be obtained.

UFRW Irrigated Lands Prop 50 Project

The UFRW Irrigated Lands Prop 50 Project's main objective is interacting with local agricultural landowners and supporting work activities within the UFRW which would be responsive to the requirements of the Central Valley Regional Water Quality Control Board's (RWQCB's) agricultural discharge waiver program to address water quality issues associated with discharge from irrigated lands in this area. The Prop 50 Project

[10]Interview Plumas County Environmental Health Agency Director, February 2007
[11] Personal interview, June 2006
[12]Sierra Booster Staff. *Loyalton's General Plan Advisory Group*. Sierra Booster: Volume 57, Number 13 March 23, 2007

Team has established a baseline Water Quality Monitoring Plan consistent with Phase I requirements of the RWQCB Irrigated Lands Program (ILP) bracketing irrigated agriculture in the main valleys of the UFRW. There are 19 sample sites where ambient water quantity and quality are monitored by the project team. A survey of UFRW irrigated ag producers was conducted during the summer of 2006. More than 35% return/response rate was received from the 145 surveys mailed. Producers responded to a variety of questions regarding water use and irrigation practices, production figures, and pasture or crop management practices. Survey responses contributed to the information contained in this report. The producer survey and responses are available on the UCCE Plumas Sierra Website:

http://ucce-plumassierra.ucdavis.edu/Ag%5FWater%5FQuality%5FProgram208/

Information from the surveys indicated that there is relatively little if any reportable chemical or fertilizer use taking place on irrigated land in the UFRW. Most producers are raising livestock, mainly beef cattle. Grass for pasture and alfalfa are the main irrigated crops. It was reported that surface water was used most often for irrigating the pastures and as a water source for livestock (See Table 3).

TABLE 3: Producer Survey Summary: Sierra Valley (SV), American Valley (AV), Indian Valley (IV)

Irrigation Methods	Flood Sub-irrigation Gravity Sprinkler
Method of water delivery to pastures and fields	Ditches Pipelines Dams
Irrigated area per ranch	Ranges from13 to 2232 acres (SV) Ranges from 3 to 300 acres (AV) Ranges from 13 to 900 acres (IV)
Irrigation (how often, time of day, how much water per cycle)	Varied per producer
Irrigation Season	May-October
Source of water for irrigation	Creeks, streams, groundwater. Majority reported surface water.

Local Watershed Organizations

Plumas Watershed Forum

- http://www.countyofplumas.com/publicworks/watershed/index/htm
- Formed on May 5, 2003 as part of a larger settlement agreement resolving a lawsuit related to the State Water Project.
- Created by DWR, Plumas County Flood Control District, Water Conservation District, and the 28 other State Water Project contractors
- Created to implement watershed management and restoration activities in the UFRW for the mutual benefit of Plumas County and the State Water Project.

Feather River Coordinated Resource Management (FR CRM)

- http://feather-river-crm.org
- Alliance of natural resource management agencies, local land owners, private interests, and the public that works on the restoration of the East Branch of the North and Middle Fork of the Feather River watersheds
- **History**:
  - **1984**: PG & E started long-term plan to manage sediment at Rock Creek Reservoir
    - Initiated meetings with government agencies (Army Corps of Engineers, California Department of Fish & Game, NRCS, Plumas National Forest, Plumas County) responsible for control of erosion
    - Determined attempts to control erosion should be a cooperative effort
  - **1985**: Agencies organized and formed FR CRM
    - The goals of the CRM:
      - Identifying erosion sources
      - Coordinating between public and private landowners
      - Implementing erosion control projects where practical
      - Ensuring project cost effectiveness for contributors
      - Developing a cooperative regional erosion control plan
- **CRM Accomplishments:**
  - Over 80 watershed projects have been completed
  - Over 30 miles of stream and 2,800 riparian acres have been treated
  - 9 continuous recording stations
  - 22 monitoring reach sites
  - 39 Projects in UFRW area

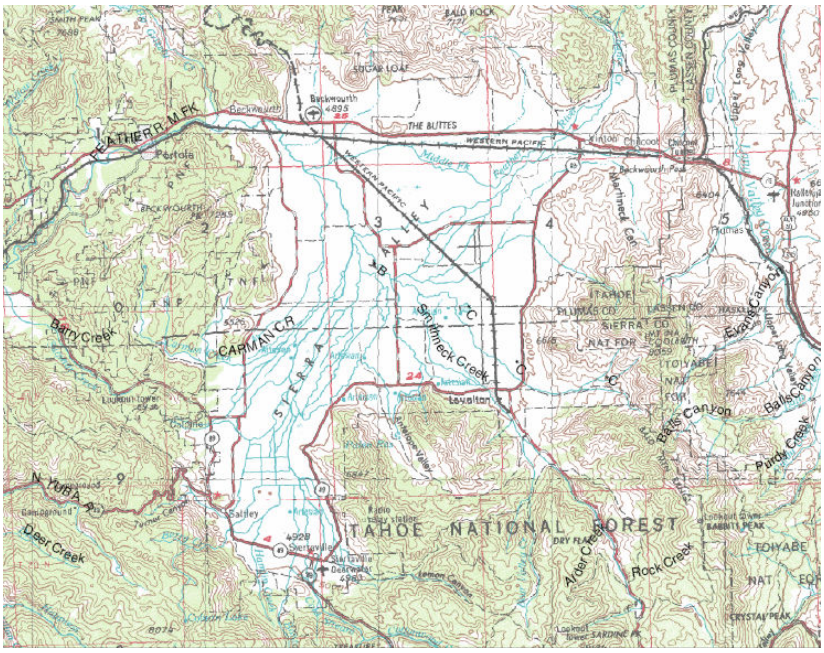
Source: Feather River CRM. Organization Profile. Fact Sheet #1, January 1997.

Sierra Valley – Irrigated Agricultural Practices

Sierra Valley Watershed Characteristics

- **Total Acres:** ~300,000 ac.
- **Irrigated Acres**: ~40,000 ac.
- **Elevation**: ~ 5,000 ft
- **Average Annual Temperature**: Low 30°F / High 63°F
  - Record Low: -29°F (December 9, 1972)
  - Record High: 104°-107°F
- **Growing Season**: 60-90 days on valley floor
- **Average Precipitation**: ~15-20 inches per year
- **Highest Average Snow Fall**: January ~17.9 inches
  - Highest total snow fall: 242.3 inches in 1952 (Sierraville Ranger Station)

Sierra Valley encompasses approximately 300,000 acres in Plumas and Sierra Counties. Many creeks and streams flow into the valley from the surrounding mountains. At just less than 5,000 feet elevation, Sierra Valley is known as the largest high-alpine valley in the continental United States. The valley is on the route of the North American Migration Flyway, which makes Sierra Valley a seasonal home to a great variety of migrating birds. All water in the Sierra Valley watershed naturally flows into the Middle Fork of the Feather River which exits the valley near the town of Beckwourth along State Highway 70.



The winter months average from 30ºF to mid 40ºFs throughout the watershed. The valley typically experiences its first fall freeze in September, and the growing season is based on long term weather records. Precipitation decreases rapidly from west to east, reflecting a strong rain-shadow effect of the Sierra Nevada and Cascade mountains. Precipitation not only feeds the creeks and rivers of the region, but recharges the groundwater resource as well.

Hydrology: The average annual precipitation in Sierra Valley varies from less than 15 inches on the east side of the watershed near Vinton to more than 60 inches southwest of Sierraville. Most precipitation falls during the winter months with 77% of total received

between November and March. January is reported as having the highest average snowfall at approximately 17.9 inches.

Major tributaries contributing to the Middle Fork Feather River within the Sierra Valley Watershed include: (See Figure 2)[13]

- Little Last Chance Creek
- Smithneck Creek
- Cold Stream
- Miller Creek
- Turner Canyon Creek

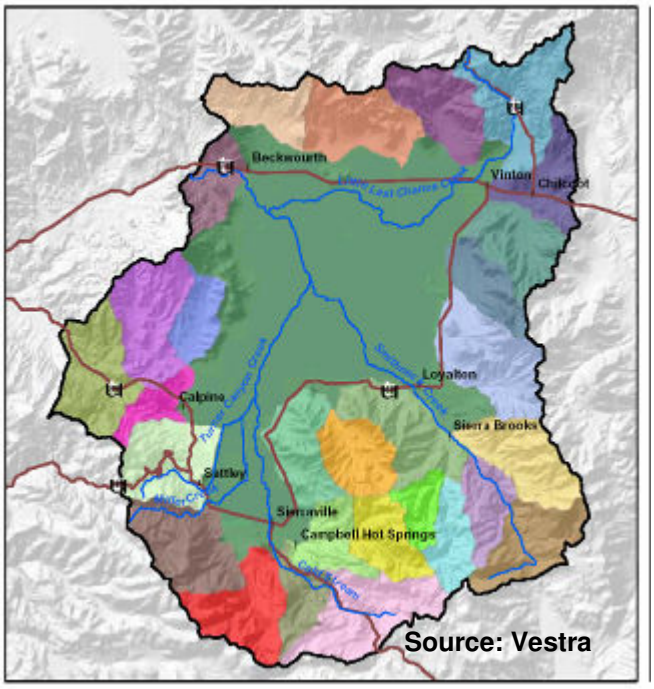


Figure 2 – Sierra Valley Watershed (Simplified)

The 2005 Sierra Valley Watershed Assessment reported that surface water enters Sierra Valley from Little Last Chance Creek below Frenchman Dam and leaves Sierra Valley from the Middle Fork Feather River east of Portola. The Big Grizzly Creek enters the Middle Fork Feather River between the western boundary of the watershed and Portola. Historically, surface water discharge has been measured on Little Last Chance Creek, Big Grizzly Creek, and on the Middle Fork Feather River at Portola. The average annual flow in Little Last Chance Creek between 1959 and 1979 was 26.8 cubic feet per second or 19,400 acre-feet per year. For Big Grizzly Creek near Portola the average annual flow was 34.7 cubic feet per second or 25,100 acre-feet per year. In addition, it was reported that the surface water runoff from the Sierra Valley Watershed averages 133,300 acre-feet per year[14].

[13] Map from 2005 Sierra Valley Water Assessment (SV RCD)
[14] Sierra Valley Watershed Assessment
http://www.sierravalleyrcd.org/nodes/resources/documents/FINAL_SIERRAVALLEYWATERHSEDASSESSMENT.pdf

MORE SIERRA VALLEY HYDROLOGIC INFORMATION:

- **2005 Sierra Valley Watershed Assessment located on SV RCD website:** http://www.sierravalleyrcd.org/nodes/resources/documents/FINAL_SIERRAVALLEYWATERHSEDASSESSMENT.pdf
- **State of California Department of Water Resources (DWR) website** http://www.water.ca.gov
- **Feather River Watershed Management Strategy document developed by the Plumas County Flood Control and Water District** www.montereyamendmants.water.ca.gov).

Agricultural Water Use Over 40,000 acres are irrigated to produce alfalfa, other hay crops and pasture in Sierra Valley. Irrigation water is primarily supplied by snowmelt and is in high demand during the late summer and early fall months. Over the years, agricultural water use in the valley has shifted from primarily flood irrigation to a mixture of flood and sprinkler irrigation. Some tributary channels on the valley floor have been channelized and reconstructed to move water more efficiently. According to the Department of Water Resources (DWR) Land Use Classifications, Sierra Valley contains 432 miles of perennial streams, 271 miles of seasonal streams, and 37 miles of canals throughout the valley floor.

Water Rights and Irrigation: In 1939, Plumas County Superior Court outlined water rights in Sierra Valley. Judgment and Decree 3095 was filed in Plumas County in 1940. The following irrigation districts manage adjudicated flows in Sierra Valley and were formed to provide reliable water to agricultural producers in the valley:

1) Sierra Valley Ground Water Management District

The Sierra Valley Ground Water Management District (SVGWMD) established in 1981, was formed to preserve the groundwater resource in Sierra Valley and to protect the agricultural economy for the common benefit of the valley. In addition, it protects groundwater overdraft, prevents exportation, and established a monitoring system to gather sound data for making water use decisions. The SVGWMD produced The Sierra Valley 2003-2005 Hydrological Study; available for review at the Plumas County Flood Control and Water Conservation District, in Quincy CA (Public Works). For more information, please contact Public Works Director Bob Perrault at 283-6268.

2) Sierra Valley Water Company

Flows from Boca, Stampede and Prossor Reservoirs that are diverted to Sierra Valley are controlled by the Sierra Valley Water Company, established in 1913.

The Little Truckee Ditch supplies approximately 7,000 acre-feet of water annually to Cold Stream. Flows are adjusted by a California DWR watermaster at the Sierra Valley Water Company Diversion Dam, which brings the water more than 12 miles via a small hand dug canal into Sierraville. Landowners have adjudicated rights (shares of the water company) to this water, which flows all the way to the Beckwourth area in the north end of the valley.

3) Little Last Chance Irrigation District

From Frenchman's Reservoir another adjudicated flow feeds agricultural operations that are a part of the Little Last Chance Irrigation System. These flows are monitored and adjusted by the DWR watermaster.

Other sources of irrigation water in the Sierra Valley are both drilled and artesian wells. Drilled wells have increased in number, within the last 50 years, resulting in decreased ground water levels. The Sierra Valley Groundwater Management District was created to address the issue of diminished ground water. Irrigation is the primary use of groundwater in the Sierra Valley Watershed. The Sierra Valley Watershed Assessment (SVRCD 2005) reports that 98% of surface and groundwater in Sierra Valley is used for irrigation. With 85% diverted from surface water and 15% pumped from groundwater.

Historic Accounts of Agriculture in Sierra Valley

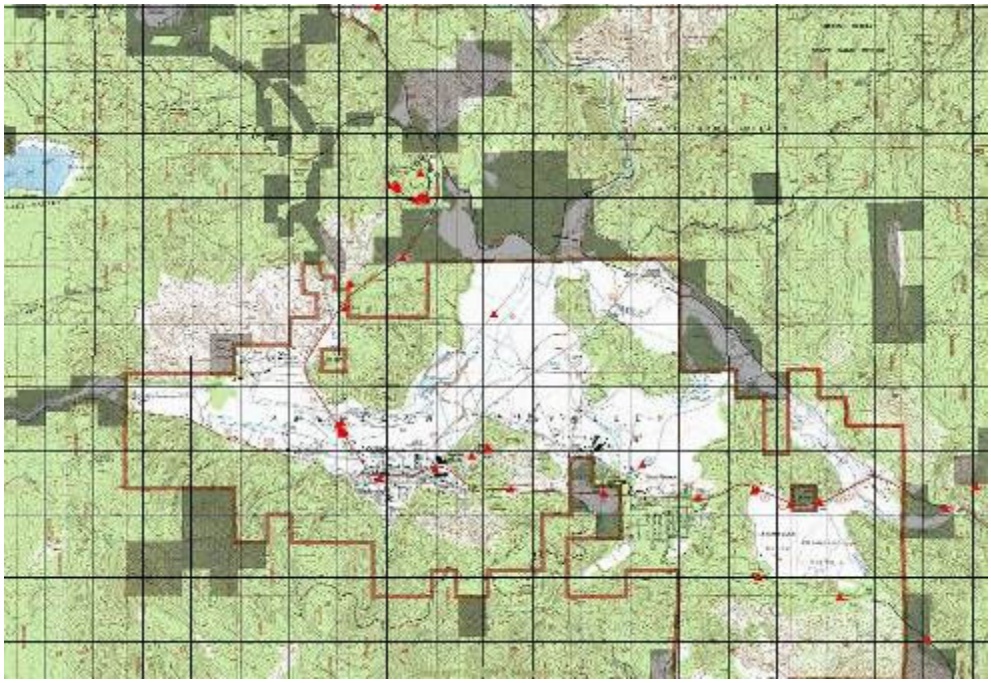
"During the 1920's there were hundereds of people in the lumber and ranching work force and supporting the industries in the Sierra Valley."
(Attilio Genasci – Journey to Eden)

"Gold was the draw. That brought the people. Then they had to have food: beef, butter, eggs, and feed for the horses and mules that worked in the mines surrounding Sierra Valley."

"There were about 80 families that lived in the floor of the valley. That meant that they had to put up hay and that meant there were thousands of men working the hay fields in the summer they were hired from the Sacramento Valley."

American Valley – Irrigated Agricultural Practices

American Valley is located at the northeastern end of the Sierra Nevada Mountains, in the heart of the Plumas National Forest in Northern California. At approximately 3,409 feet elevation, American Valley supports a population of 6,500 people. The largest community in the valley, Quincy, CA, also serves as the Plumas County seat.



Hydrology-Drainage Patterns: Two main watercourses, Spanish Creek and Greenhorn Creek, run through the valley. They converge at the end of the valley and the combined flow merges further downstream with Indian Creek to form part of the East Branch of the North Fork of the Feather River. The American Valley watershed also contains a series of intermittent and perennial tributaries that drain into Spanish and Greenhorn Creek. Storm events result in high flows through the valley although flooding is usually limited. A storm event on 2005 New Year's Eve produced a 10-year flood event in the Spanish Creek watershed with flows calculated at 13,500cfs[15].

American Valley Watershed Characteristics

- **Total Acres:** ~6,720 acres
- **Irrigated Acres**: ~1,850 acres
- **Elevation**: 3,409 ft.
- **Average Annual Temperature**: 51°F
  - Low: 24°F (Jan)
  - High: 94 (July)
- **Growing Season**: 4 months (June-Sept)
- **Average Precipitation**: 40 inches

This alluvial valley historically served as a floodplain. Presently, the channels are deeply incised, confining flows to within the high banks of the channels. Rarely does water from the channels reach the surface of the meadow. Meadow dewatering adjacent to the

[15] Feather River CRM

streams and a change in the riparian plant and animal communities has occurred over time resulting in gully formation and incision in many places. In fact, both natural events and 100 years of intensive use has increased the width 16 and half feet in 1871

Land Use and History: A variety of land uses contribute to the condition of water quality in American Valley. Historically, mining, grazing, agriculture, and logging have played a large role in attracting people to this part of the UFRW. Requiring a large labor force, these land uses resulted in the urban development of Quincy and the development of infrastructure to support a booming community in the later part of the 19th century.

Greenhorn Creek History

- Width increase: 16 ½ feet in 1871 to approx. 50-275 feet today
- 1923: Highway department channelized and moved the creek from west edge of American Valley to middle of valley
- 1963: Flood, mill pond breached seven miles above project, 8 beaver dams destroyed
- 1968: Lg. gravel bars deposited=erosion & undermining riparian vegetation. Banks bare, channel shallow
- Water quality declined, trophy trout no longer caught
- 1984: concerned landowners request FR CRM to accept Greenhorn creek as project
- 1988: CRM team tour proposed project area
    - Goals:
        - Restore channel stability & riparian habitat to increase trout population
        - Provide roadside, flat-terrain catch & release fishing opportunities within
        - Demonstrate geomorphic techniques for trout habitat enhancement
- 1991: Construction of project, ongoing monitoring

Source: Feather River CRM . Greenhorn Creek Trout Habitat Enhancement Project. Fact Sheet #4, January 1996.

In 1852 gold discoveries were made along Mill Creek and along the edges of American Valley. Two miles north of Quincy on the northwestern edges of American Valley, Elizabethtown's gold attracted many prospectors. Elizabethtown became the most populous settlement in Plumas County by 1853. By the mid to late 1850's miners had spread throughout the Plumas County area.

By 1880, 20 farmers had established ranches with a collective total of 4,500 acres of American Valley's 6,720 total acres claimed as ranch land. With the production of beef and dairy cattle, hay, wheat, oats, barley, potatoes, vegetables, and fruit orchards, American Valley was coined, "one of the most fertile and lovely of the mountain valleys that are scattered throughout the whole range of the green Sierra." [16]

The wet meadows throughout American Valley were drained to allow greater access to cattle and then irrigated for hay production. Beavers, once prevalent in the American Valley, were nearly eliminated, greatly altering the hydraulic function of the watershed. By the late 1800s to early 1900s, intensive sheep grazing in

[16] Young, Jim. Plumas County: History of Feather River Region (The Making of America). Chicago, IL, 2003.

the upland areas and intensive cattle grazing on the large valley meadows had severely damaged stream and riparian areas within American Valley. By 1920, upland areas had begun eroding while the valley meadows responded with the formation of deep gullies.

Logging, which began shortly after the arrival of miners, first served to meet the growing demands of mining settlements. The first lumber mill in the Quincy area was built in the winter of 1852-53. In the following years, water powered mills were built to serve the community and later were replaced by steam and electricity. Eventually ox and mule teams gave way to trucks and tractors. For many years timber clear-cutting created habitat and erosion challenges to the watershed.

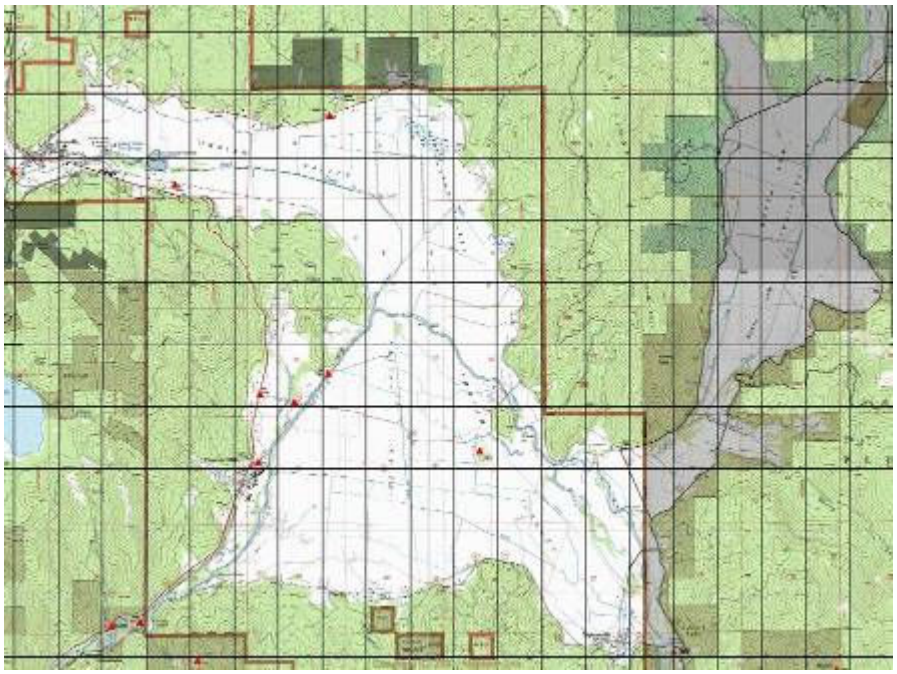
Prior to the development of a road system, intermittent and ephemeral stream channels were often used to transport the logs downstream to landings. As the demand for lumber grew, a series of roads were built throughout the Plumas National Forest allowing access to logged areas and to assist in the transport of logs. Both the roads and channels used for the transport of logs had a large impact on the American Valley watershed. Roads contributed to increased runoff and erosion while the use of existing channels had great impact on riparian habitat and channel geomorphology.

The resulting condition of the American Valley meadow, channels, and water quality are a culmination of the historical land use and management practices mentioned above as well as the present-day land use.

Current Agricultural Land Use: Today, a total of 1,850 acres are irrigated throughout American Valley. Most of the irrigated acreage is pasture for grazing livestock (approx. 1,500 acres). There are 300 acres used for grass hay production and deferred grazing with 80 acres for producing alfalfa. Local ranchers estimate 500-1,000 head of cattle are in American Valley for 7 months (May-Nov.) (Personal interview with landowner, June, 2006). Winter feeding of trail horses occurs at a couple locations in American Valley. For example, the Feather River College (FRC) Equine Facility houses horses year round.

Indian Valley – Irrigated Agricultural Practices

Settlement of the Valley: Around the end of the 19th Century, Indian Valley was considered by nearly everyone to be the most important valley of Plumas County. With three towns and many valuable mines, fertile farms, and lumber mills, this once swampy land developed into a highly prosperous agricultural community.



In the fall of 1850, Peter Lassen arrived and named the place Caché Valley. Many prospecting parties passed through the valley, including the Noble party in 1851. As Noble's party came over the mountain from American Valley and saw the abundant population of Maidu in the valley, they named it Indian Valley, which was quickly adopted. Among the 80 men in Noble's party was Jobe T. Taylor who later claimed the land now occupied by Taylorsville in February of 1852. Later that fall, immigrants (many were Swiss-Italian) started coming into the valley through the Beckwourth pass and took land claims. Immigration continued after 1853 and a large portion of the valley began to be cultivated. By 1882 there were about 50 farms in the 14,000 acre valley, where about 10,000 of those acres were tillable. The population of the valley reached a plateau from the 1870's to the 1920's.

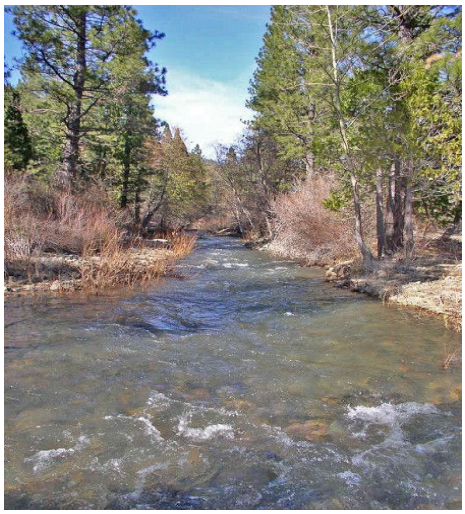
Indian Valley Watershed Characteristics

- **Total Acres:** ~14,000 acres
- **Irrigated Acres**:~ 4,800-5,000 acres
- **Elevation**: 3,528 ft
- **Average Annual Temperature**:
  - Record Low: -28°F (1972)
  - Record High: 110°F (1990)
- **Growing Season**: 4 months (June-Sept)
- **Average Precipitation**: 40-45 inches, 50% as snow

Water Use and Irrigation: The main sources of water in the valley were basically the same around the turn of the century

as they are today; a few natural springs, but mainly Indian Creek and its tributaries: Wolf Creek, Lights Creek, Ward Creek, Little Grizzly Creek, Last Chance Creek, and Red Clover Creek.

The Indian Creek stream and irrigation systems depend on the melting snow from the upper watershed. During the settling era of the valley, the climate was slightly different. Snows started in October and it was not uncommon to have seven feet of it on the valley floor during peak snowfall. Consequently, flooding was more common during the spring rains, because more water was standing on the valley floor than the floods of today. During the summer, rain showers were more frequent. Also, there were many artesian wells in the valley before the Indian Creek stream system was heavily used for irrigation.



Irrigation in Indian Valley began when the first settlers dammed the creeks and streams to provide water to the fields. The irrigation season, in those days, is thought to have been about a month later than that of today because of the difference in climate mentioned earlier.

Wolf Creek History

- By 1990 channel widened to 100 ft. in some places
- Headwaters begin 1,700 ft above the floor of Indian Valley
- Erosion due to human activity
  - Wagon road built in 1863
  - Improved to paved highway in 1930s (Hwy 89).
  - Western Pacific Railroad completed in 1931 following creek channel for 5 miles
  - 125 acres of hard surfaces increasing runoff and flooding
  - 2 lumber mills present in 1940s and '50s
  - Timber harvesting (impact from this is considered small)
  - Homes and business areas increasing hard surfaces
  - Dam failures which lowered the creek an average of 6 feet.
  - Previous stream alterations by Army Corps of Engineers including draining marshes, channel straightening, vegetation removal, and construction of walls along the banks.
  - Walls along streambanks undermined during 1980 floods

Source: Feather River CRM. Wolf Creek Restoration Project. Fact Sheet #5, March 1996.

In 1855 Taylor constructed a Millrace out of Indian Creek near Taylorsville to power his sawmill where he cut the lumber for his four story gristmill. Later, on October 10, 1873, the Millrace became a large irrigation ditch that has since supplied many ranches. A 1946 Indian Creek adjudication report recorded that the total number of acres irrigated in all of Indian and Genesee Valleys was 10,342; of that, the Millrace, 1.3 miles long, irrigated a total of 3,450 acres. Today the Millrace is approximately 10 miles long and irrigates roughly 4,800-5,000 acres, spread out among 12 ranches. Water is mainly used for irrigation, but supplies some domestic uses as well. Some portions of the irrigation ditch are fenced off, while others are not. The Millrace water supply is shut off by November 1st.

In the summer of 1858, a "Committee" of men on horseback set out from Sacramento to survey the agriculture in Northern

California for the State Agricultural Report. Below is a short excerpt on irrigation from their intriguingly detailed description of Jobe Taylor's Ranch:

> *The irrigation in this Valley is peculiar. Nearly all the land is gently sloping toward the stream in the centre. Many rills flow from the mountain springs. These are thrown into ditches, two feet wide and one deep, cut (and thrown out clean,) parallel with the base of the mountain, and at such distances as are indicated by the character of the soil, whether more or less porous. The water passing very slowly through these ditches, soaks through the soil on the lower side, thus keeping the subsoil moist till it reaches the next ditch, and so on till it reaches the creek. And we have never seen any other system of irrigation which we regard so perfect in itself, and as free from objection, as this. Nor have we ever seen any other district of this State so thoroughly and systematically supplied with water by artificial means. The "improvements" of a farm in this Valley are not considered as being enumerated until the rods or miles of "ditch" for irrigation are given.*

Livestock and Crops: Agriculture in Indian Valley was very productive from the beginning. Grain, oats, barley, wheat, vegetables, hay, and dairy cattle were some of the leading agricultural commodities raised in the early years; dairy being number one. There were about five or six dairies at one time, and two creameries; one in Taylorsville and one in Genesee producing large quantities of milk, butter, and cheese. The assessor's report for 1855 shows there were 715 head of cattle (however, it was not stated whether dairy, beef, or both) in Plumas County and for 1881 there were 10,000 head. About 3,000 acres of the valley were used for growing grain while the remainder was mostly used for pasture and hay.

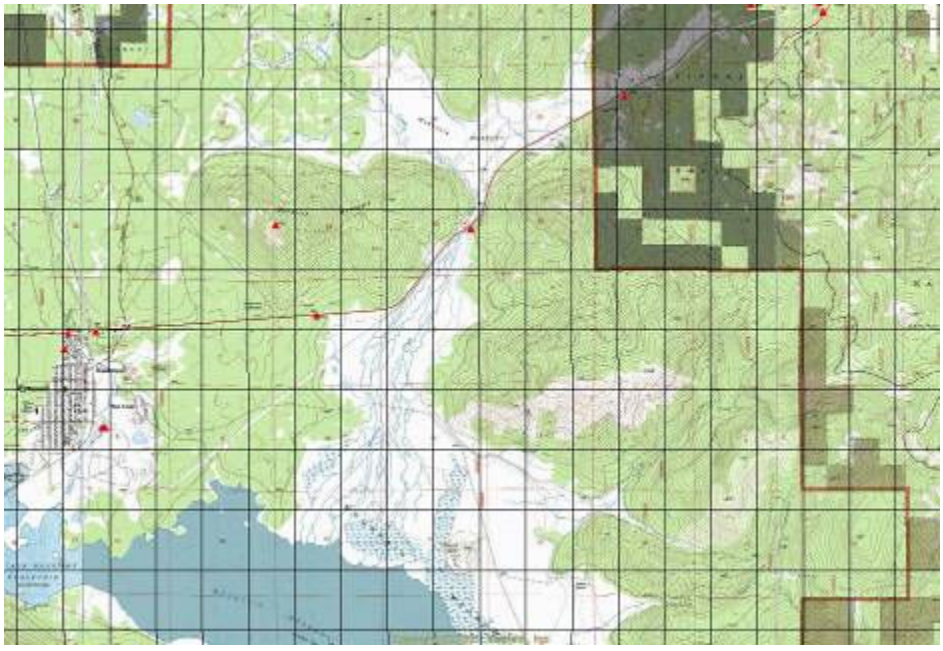
Later on, beef cattle production increased in the valley. Most ranchers over wintered their cattle due to limited access to the Central Valley, therefore they relied heavily on the success of their hay crops. It is thought by many that the carrying capacities of the pastures were greater then than now, due to ranchers depending on the quality of their land management. Today there are roughly 5,600 head of beef cattle in Indian Valley from May through November, and about 12 ranchers producing hay crops. Currently, most ranchers ship their cattle down to the Central Valley for the winter.

Around the 1950's, the government started paying ranchers and farmers to decrease their agricultural production by reducing the number of crops grown, gallons of milk produced, and so on in an effort to keep the prices stable. A beef cattle rancher in North Arm also raised 5,000-6,000 turkeys and 3,000 laying hens for about five years. Another major agricultural product of early Indian Valley was lumber from the seven mills that once existed.

Management Practices: Around the turn of the 20th century, people started using equipment to drag fields to break up the manure and manure spreaders for pasture fertilization. The practice of dragging fields is still used in Indian Valley. In the early 1900's, very few ranchers fenced off the stream banks where they knew flood damage would not occur. Then, with the development of the Soil Conservation Service (SCS) in 1935 (now NRCS), more landowners implemented management practices to improve the natural resources on and around their land. The SCS came to Plumas and Sierra Counties around the 1950s or 1960s. Shortly after, the Indian-American Valleys Resource Conservation District (RCD) and Sierra Valley RCD were established in 1954 and 1947, respectively. The Indian-American Valleys RCD, now known as the Feather River RCD, partnered with Plumas County in the once acceptable channelization of Indian Creek along the railroad, as well as to help ranchers and farmers to clean out flood damaged irrigation and sediment deposition in fields and pastures. Today there are about ten Indian Valley landowners enrolled in NRCS programs to implement natural resource conservation management practices covering 3,147 acres and totaling $226,096 in contract costs. (See Appendix I)

Goodrich Creek & Associated Meadows – Irrigated Agricultural Practices

Goodrich creek is a spring fed stream that flows out of the mountains north of Westwood in western Lassen County. Being spring fed it is characterized by clear water and relatively constant flows. Goodrich creek flows into Mt. Meadows Reservoir (Walker Lake) and ultimately into Lake Almanor and the Feather River system. Prior to reaching the reservoir, the creek is used for irrigation on grazed meadows both above and below state Highway 36.



The sole irrigated crop in the Goodrich Creek watershed is meadow pasture, which is flood irrigated from late May to September (at 5100 ft elevation the growing season is short). Water is diverted from Goodrich Creek in three locations where it flows through delivery ditches before being spread across the fields. Ditch tenders move water from one irrigation 'set' to the next as needed. The ditch system is simple, and much of the land is not leveled so the application of water is not very precise. The plant community in the meadows reflects certain areas that are relatively wet or dry.

These pastures, which consist of perennial grasses, sedges, rushes and forbs, are perennial systems with very little year-to-year manipulation of the plant community in terms of tillage, seeding, etc. The main mechanical activity is ditch cleaning or maintenance that occurs as needed on an annual basis.

Beef cattle production is the predominant agricultural use of the meadows. Wildlife, including ducks, geese, Sandhill cranes, and other birds, are common. Occasionally, deer or black bear are seen in or around the meadows as well. The section of Goodrich Creek that transects the irrigated meadows is also a popular trout fishery for anglers.

In a typical production year, cow/calf pairs are shipped into the area in late May to early June. Some years' stocker or yearling cattle are grazed as well. The exact date cattle are turned out varies annually, but is generally based on the time when meadows become dry enough for grazing without excessive damage to the sod or soil. During the grazing season, cattle are rotated through pastures to improve overall livestock distribution and help maintain plant vigor. Cattle grazing occurs in coordination with use of the surrounding rangeland and federal grazing permits, thus the number of cattle on the meadow varies by season. Some cattle are maintained on the meadows throughout the summer, while others spend the majority of the summer on range and are gathered back into the meadows for a short time in the fall before being trucked back to the foothills for winter. Cattle are usually shipped out for the winter by early November. Overall stocking rates are generally less than 1 animal unit per acre of irrigated forage.

Chemical use in the irrigated lands is minimal to non-existent, depending on the year. If chemicals are applied it is generally spot (hand) treatment of perennial weeds, utilizing common chemicals such as glyphosate or 2,4-D. Total treated acres in the past several years have probably never exceeded 5 acres. Fertilization of the pastures is not common.

Related Resources

California Department of Water Resources (DWR): http://www.water.ca.gov

California DWR – Division of Flood Management
http://cdec.water.ca.gov/river/featherstages.html

California Data Exchange Center (CDEC): http://cdec.water.ca.gov/

DWR Watermaster/ staff (530-832-5161)
- -Jim Scarborough (SV)
- -Bill Dickens (Little Last Chance)
- -Margaret Vendlin (IV)
- -Chris Erickson (Water quality from reservoirs)
- -Ron Vascoy (SV)

Department of Conservation (DOC): http://www.consrv.ca.gov/index

Feather River Watershed Management Strategy, 1/1/2004:
http://www.montereyamendments.water.ca.gov/doc/FeatherRiverStrategy.pdf

Feather River CRM (FR CRM): http://www.feather-river-crm.org/

Feather River Resource Conservation District (FR RCD):
http://carcd.org/wisp/featherriver

Natural Resources Conservation Service (NRCS): http://www.nrcs.usda.gov./

Plumas County – Plumas Watershed Forum
http://www.countyofplumas.com/publicworks/watershed/index/htm

Sacramento River Watershed Program (Plumas County):
http://www.sacriver.org/education/county-plumas.html

Sierra Valley RCD: http://ww.sierravalleyrcd.org

State Water Resources Control Board: http://www.waterboards.ca.gov

USDA Forest Service: http://www.fs.fed.us/r5/plumas

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http://www.countyofplumas.com/publicworks/watershed/index/htm

Sacramento River Watershed Evaluation Report, April 1, 2004: Prepared by the Sacramento Valley Water Quality Coalition, Sacramento, California

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Sierra Valley RCD: http://ww.sierravalleyrcd.org

Sierra Valley Watershed Assessment
http://www.sierravalleyrcd.org/nodes/resources/documents/FINAL_SIERRAVALLEYWATERHSEDASSESSMENT.pdf

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USDA's National Agricultural Statistics Service, California Field Office:
www.nass.usda.gov/ca

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Appendix I

Summary of all NRCS Programs in Plumas and Sierra Counties from 1998-2006

EQIP	1998-2005	**# of Contracts**	**Acres**	**Contract Dollars**
	Sierra Valley	26	44,093	$886,089
1998-2006	Indian Valley	8	3,134	$209,266
	American Valley	8	5,464	$283,636
	Total EQIP:	42	52,691	$1,378,991

CRP	1998-2006	**# of Contracts**	**Acres**	**Contract Dollars**
	Sierra Valley	1	34	$18,255
	Indian Valley	1	13	$16,830
	American Valley	0	0	$0
	Total CRP:	2	47	$35,085

WHIP	1998-2006	**# of Contracts**	**Acres**	**Contract Dollars**
	Sierra Valley	2	337	$19,898
	Indian Valley	0	0	$0
	American Valley	3	137	$29,770
	Total WHIP:	5	474	$49,668

WRP	1998-2006	**# of Contracts**	**Acres**	**Contract Dollars**
	Sierra Valley	1	266	$71,550
	Indian Valley	0	0	$0
	Cradle Valley	1	160	$22,782
	American Valley	1	15	$19,013
	Total WRP:	3	441	$113,345

GRP	1998-2006	**# of Contracts**	**Acres**	**Contract Dollars**
	Sierra Valley	1	1,150	$88,350
	Indian Valley	0	0	$0
	American Valley	0	0	$0
	Total GRP:	1	1,150	$88,350

PL-566	1993-2004	**# of Contracts**	**Acres**	**Contract Dollars**
	Indian Valley	16	5,411	$605,602
	Total PL-566:	16	5,411	$605,602

Totals by Valley

	# of Contracts	**Acres**	**Contract Dollars**
Sierra Valley:	31	45,880	$1,084,142
Indian Valley:	25	8,558	$831,698
American Valley:	12	5,616	$332,419
Cradle Valley:	1	160	$22,782
TOTAL:	69	60,214	$2,271,041

Program Names:
EQIP - Environmental Quality Incentives Program
CRP - Conservation Reserve Program
WHIP - Wildlife Habitat Improvement Program
WRP - Wetland Reserve Program
GRP - Grassland Reserve Program
PL-566 - Public Law 566 (*Indian Creek Watershed Restoration Plan*)

NRCS data for Environmental Quality Incentives Program in **Sierra Valley** 1998-2005

Total # of contracts: 26

Total contract dollars spent: $886,089

Total acres under contract: 44093

resource types affected by # of contracts					
range	forest	pasture	wildlife	wetland	nursery
6	7	14	2	1	1

# of practices implemented	NRCS practice code # and name
	313 waste storage facility
8	314 brush management
	317 composting facility
2	322 channel vegetation
1	338 perscribed burning
3	342 Critical Area Planning
	350 sediment basin
	351 well decommissioning
	353 monitoring well
1	356 dike
	359 waste treatment lagoon
	365 anaerobic digester, ambient temperature
	366 anaerobic digester, controlled temperature
	367 waste facility cover
3	378 pond
28	382 fence
4	386 field border
	388 irrigation field ditch
1	394 fire break
10	410 rock structure/grade stabilization
	428B irrigation water conveyance - ditch and canal lining - flexible lining
	430 irrigation for water conveyance
1	430FF Irrigation water conveyance, steel pipeline
1	441 irrigation system, micro irrigation
1	442 irrigation system, sprinkler
	449 irrigation water management
	460 land clearing
	466 land smoothing
7	472 use exclusion
22	516 pipeline
14	528A prescribed grazing
8	533 pumping plant for water control
	543 land reconstruction, abandoned mined land
	544 land reconstruction, currently mined land
15	550 range planting
2	552-A Irrigation regulation reservoir
1	552-B irrigation regulating reservior
3	560 access road
	561 heavy use area protection
	572 spoil basin
4	574 spring development
7	575 animal trails and walkways
	578 stream crossing
2	580 streambank and shoreline protection
1	584 stream channel stabilization
12	587 structure for water control
2	595 pest management
	606 subsurface drain
7	612 tree shrub establishment
18	614 trough/tank
	630 vertical drain
	634 manure transfer
	636 water harvesting catchment
	638 water and sediment control basin
8	642 well
2	645 upland wildlife habitat management
2	648 wildlife watering facility
1	655 forest trails and landings
	657 wetland restoration
1	660 tree/shrub pruning
10	666 forest stand improvement

NRCS data for Environmental Quality Incentives Program in **Indian Valley** 1998-2006

Total # of contracts: 8

Total contract dollars spent: $209,266

Total acres under contract: 3134

resource types affected by # of contracts		
forest	pasture	creek
7	1	1

# of practices implemented	NRCS practice code # and name
	313 waste storage facility
2	314 brush management
	317 composting facility
	322 channel vegetation
3	338 perscribed burning
	342 Critical Area Planning
	350 sediment basin
	351 well decommissioning
	353 monitoring well
	356 dike
	359 waste treatment lagoon
	365 anaerobic digester, ambient temperature
	366 anaerobic digester, controlled temperature
	367 waste facility cover
1	378 pond
1	382 fence
	386 field border
	388 irrigation field ditch
4	394 fire break
	410 rock structure/grade stabilization
	428 B irrigation water conveyance ditch and chanallining flexible lining
	430 irrigation for water conveyance
1	430 EE Irrigation water conveyance, plastic pipeline
	430FF Irrigation water conveyance, steel pipeline
	441 irrigation system, micro irrigation
	442 irrigation system, sprinkler
	449 irrigation water management
	460 land clearing
	466 land smoothing
	472 use exclusion
2	516 pipeline
4	528A prescribed grazing
	533 pumping plant for water control
	543 land reconstruction, abandoned mined land
	544 land reconstruction, currently mined land
	550 range planting
	552-A Irrigation regulation reservoir
	552-B irrigation regulating reservior
	560 access road
	561 heavy use area protection
	572 spoil basin
	574 spring development
	575 animal trails and walkways
	578 stream crossing
	580 streambank and shoreline protection
	584 stream channel stabilization
1	587 structure for water control
	595 pest management
	606 subsurface drain
1	612 tree shrub establishment
2	614 trough/tank
	630 vertical drain
	634 manure transfer
	636 water harvesting catchment
1	638 water and sediment control basin
	642 well
1	645 upland wildlife habitat management
	648 wildlife watering facility
	655 forest trails and landings
	657 wetland restoration
	660 tree/shrub pruning
11	666 forest stand improvement

NRCS data for Environmental Quality Incentives Program in **American Valley** 1998-2005

Total # of contracts: 8

Total contract dollars spent: $283,636

Total acres under contract: 5464

resource types affected by # of contracts			
wildlife	forest	pasture	range
1	3	5	1

# of practices implemented	NRCS practice code # and name
	313 waste storage facility
4	314 brush management
	317 composting facility
	322 channel vegetation
	338 perscribed burning
2	342 Critical Area Planning
	350 sediment basin
	351 well decommissioning
	353 monitoring well
	356 dike
	359 waste treatment lagoon
	365 anaerobic digester, ambient temperature
	366 anaerobic digester, controlled temperature
	367 waste facility cover
2	378 pond
11	382 fence
	386 field border
	388 irrigation field ditch
2	394 fire break
3	410 rock structure/grade stabilization
	428 B irrigation water conveyance ditch and chanallining flexible lining
	430 irrigation for water conveyance
2	430 EE Irrigation water conveyance, plastic pipeline
	430FF Irrigation water conveyance, steel pipeline
	441 irrigation system, micro irrigation
	442 irrigation system, sprinkler
3	449 irrigation water management
	460 land clearing
1	466 land smoothing
	472 use exclusion
6	516 pipeline
9	528A prescribed grazing
4	533 pumping plant for water control
	543 land reconstruction, abandoned mined land
	544 land reconstruction, currently mined land
4	550 range planting
	552-A Irrigation regulation reservoir
	552-B irrigation regulating reservior
1	560 access road
	561 heavy use area protection
	572 spoil basin
	574 spring development
	575 animal trails and walkways
	578 stream crossing
	580 streambank and shoreline protection
2	584 stream channel stabilization
3	587 structure for water control
1	595 pest management
	606 subsurface drain
3	612 tree shrub establishment
6	614 trough/tank
	630 vertical drain
	634 manure transfer
	636 water harvesting catchment
	638 water and sediment control basin
4	642 well
	645 upland wildlife habitat management
	648 wildlife watering facility
	655 forest trails and landings
3	657 wetland restoration
	660 tree/shrub pruning
4	666 forest stand improvement
1	391 riparian forest buffer
1	395 stream habitat improvement and mgt.

NRCS data for Conservation Reserve Program - 1998-2006

Valley	Year	Acres	Total Contract Amount	NRCS Practices Implemented (by practice name)
Sierra	2006	34	$18,255	field windbreak grassed waterways shallow water areas for wildlife filter strips riparian buffers
Indian	2004	13	$16,830	riparian forest buffer tree/shrub establishment
Total ac. & $$:		47	$35,085	

Total # of Contracts:
2

NRCS data for Wildlife Habitat Improvement Program - 1998-2006

Valley	Year	Acres	Total Contract Amount	NRCS Practices Implemented (by practice name)
American	1998	100	$9,996	fence pipeline trough/tank use exclusion fish stream improvement
Sierra	1998	193	$9,998	fence critical area planning tree/shrub establishment use exclusion wetland development and restoration fish stream improvement
American	1998	27	$9,874	fence use exclusion fish stream improvement
American	1998	10	$9,900	fence use exclusion fish stream improvement grade stabilization structure
Sierra	1999	144	$9,900	tree/shrub establishment use exclusion
Total ac. & $$:		474	$49,668	

Total # of Contracts:
5

NRCS data for Wetland Reserve Program - 1998-2006

Valley	Year	Acres	Total Contract Amount	NRCS Practices Implemented (by practice name)
Cradle	2004	160	$22,782	fence tree/shrub establishment upland wildlife habitat mgt. use exclusion wetland wildlife habitat mgt.
Sierra	2003	266	$71,550	fence riparian herbaceous cover upland wildlife habitat mgt. use exclusion wetland wildlife habitat mgt. structure for water control wetland creation wetland restoration
American	2004	15	$19,013	fence tree/shrub establishment use exclusion wetland wildlife habitat mgt. structure for water control wetland restoration
Total ac. & $$:		441	$113,345	

Total # of Contracts:
3

NRCS data for Grassland Reserve Program - 1998-2006

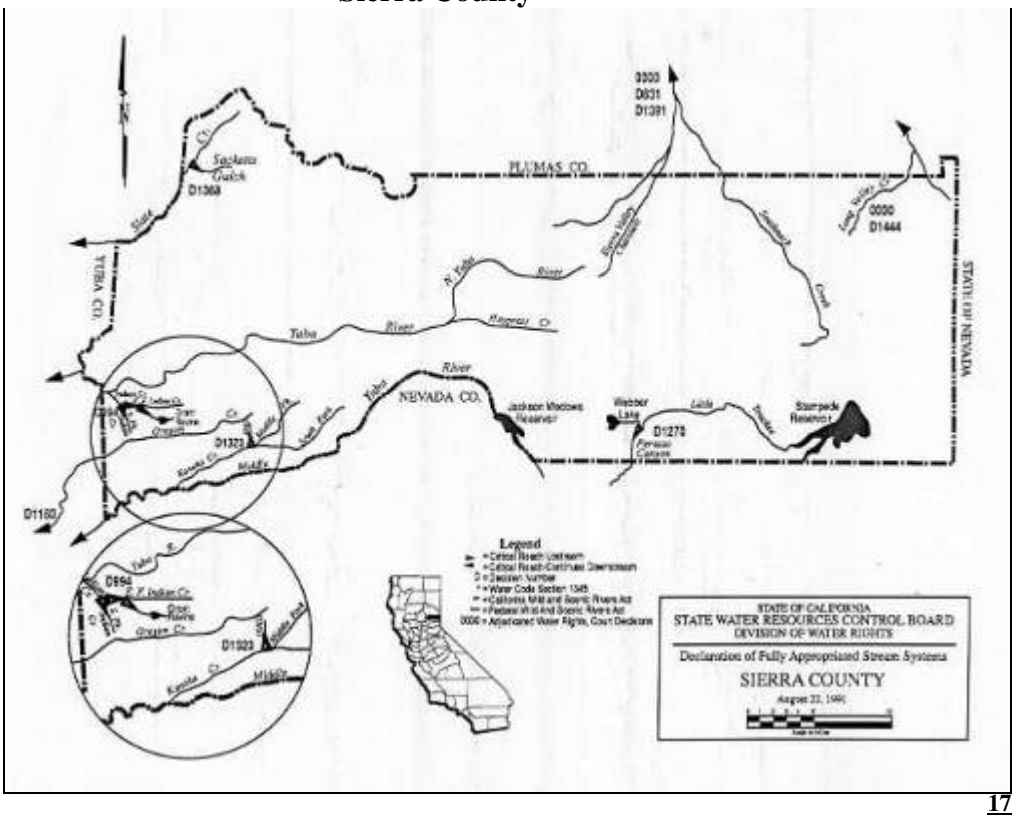
Valley	Year	Acres	Total Contract Amount	NRCS Practices Implemented (by practice name)
Sierra	2003	1150	$88,350	proper grazing use pest mgt.
Total ac. & $$:		1150	$88,350	

Total # of Contracts:
1

Appendix II – Figures

Declaration of Fully Appropriated Stream Systems
Sierra County

Figure 3

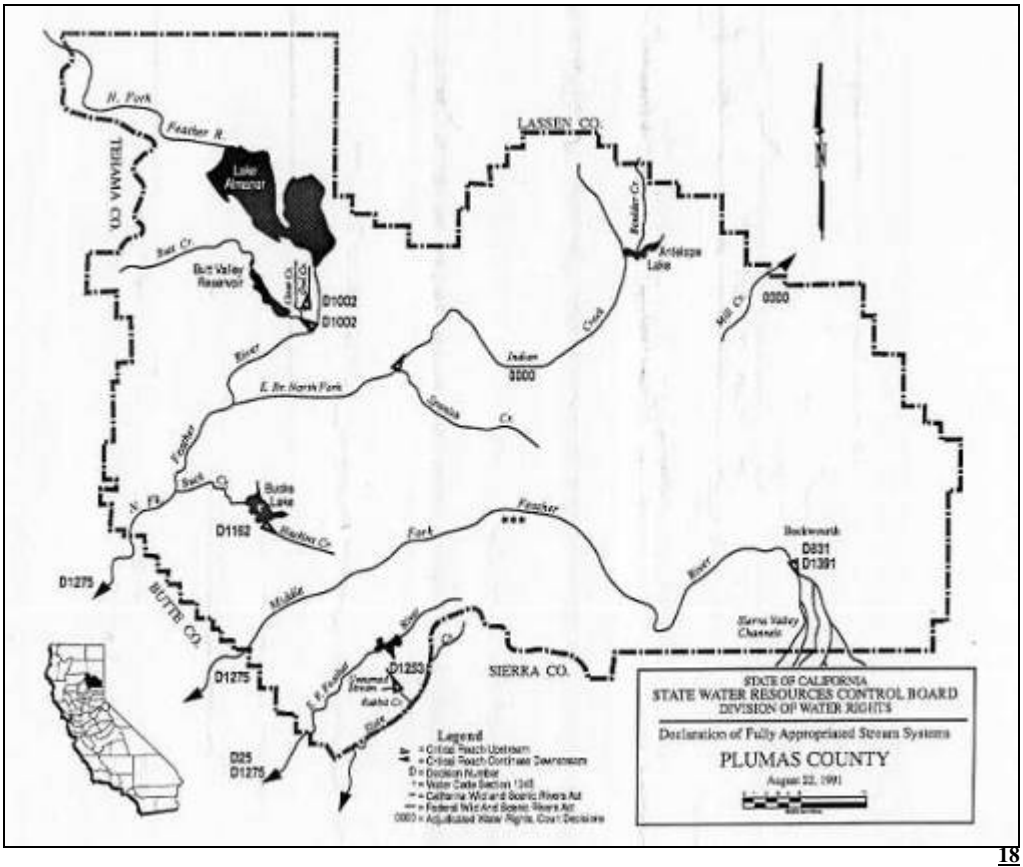


[17]

[17] From State Water Resources Control Board – Division of Water Rights
http://www.waterrights.ca.gov/html/faslist.htm

Declaration of Fully Appropriated Stream Systems
Plumas County

Figure 4



[18]

[18] From State Water Resources Control Board – Division of Water Rights
http://www.waterrights.ca.gov/html/faslist.htm