

8 WATER RESOURCES ELEMENT



A clean, safe and reliable water supply is critical to Butte County's environment and economy. Photo courtesy of Tovey Giezentanner, General Plan 2030 Citizens Advisory Committee member.

Water is one of Butte County's most important natural resources. Precipitation, surface water and groundwater contribute to Butte County's residential, commercial, agricultural, environmental, habitat and recreational uses. Population growth, continued water demands from agricultural and industrial uses, and water needs for environmental uses are all crucial needs that compete for the county's water supply.

The Water Resources Element provides information about water supply, water quality, stormwater management and water service in Butte County. This Element contains goals, policies and actions designed to protect, maintain and restore water resources.

This Element is organized into two sections as follows:

- ◆ **Background Information.** Provides a brief overview of the existing water supply and water demands in Butte County and how they are currently managed. An expanded discussion about Butte County’s water resources is available in Chapter 12 (Water Resources) of the Butte County General Plan 2030 Setting and Trends Report.
- ◆ **Goals, Policies and Actions.** Provides additional guidance to the County related to decisions about water resources.

A. Background Information

Butte County is located in the Sacramento River Hydrological Region, which includes the Sacramento River, the longest river system in the State of California and its tributaries, including the Pit, Feather, Yuba, Bear and American Rivers. The Sacramento River Hydrological Region is the main water supply for much of California’s urban and agricultural areas. Major water supplies in the region are provided through the development of surface storage reservoirs.

1. Water Sources

The primary water source in Butte County is surface water, which serves 69 percent of the county’s water needs, followed by groundwater, serving 31 percent of the water needs. Based on 2000 data, the Butte County water demand is approximately 90 percent agricultural followed by wildlife at 5 percent and residential at 5 percent.¹

a. Surface Water

Surface water resources in Butte County lie within the Sacramento River watershed. Primary waterways include the Feather River and its several

¹ Camp, Dresser & McKee, 2001, *Butte County Water Inventory and Analysis*.



Lake Oroville. Photo courtesy of Tony Rushing, General Plan 2030 Citizens Advisory Committee member.

tributaries, as well as Butte Creek and Big Chico Creek. The majority of the county's surface water supply is used for local agriculture.

The majority of the surface water supply used by Butte County residents and businesses originates in the Feather River watershed and accumulates in Lake Oroville as part of the State Water Project. Local irrigation districts' surface water rights are provided through the California water rights priority system, which recognizes the right to the use of water based on a first-in-time, first-in-line basis.

Prior to the development of the Oroville Dam, Butte County negotiated with the State of California to receive an allocation of water for growth and future needs within the county as a State Water Project Contractor. Butte County

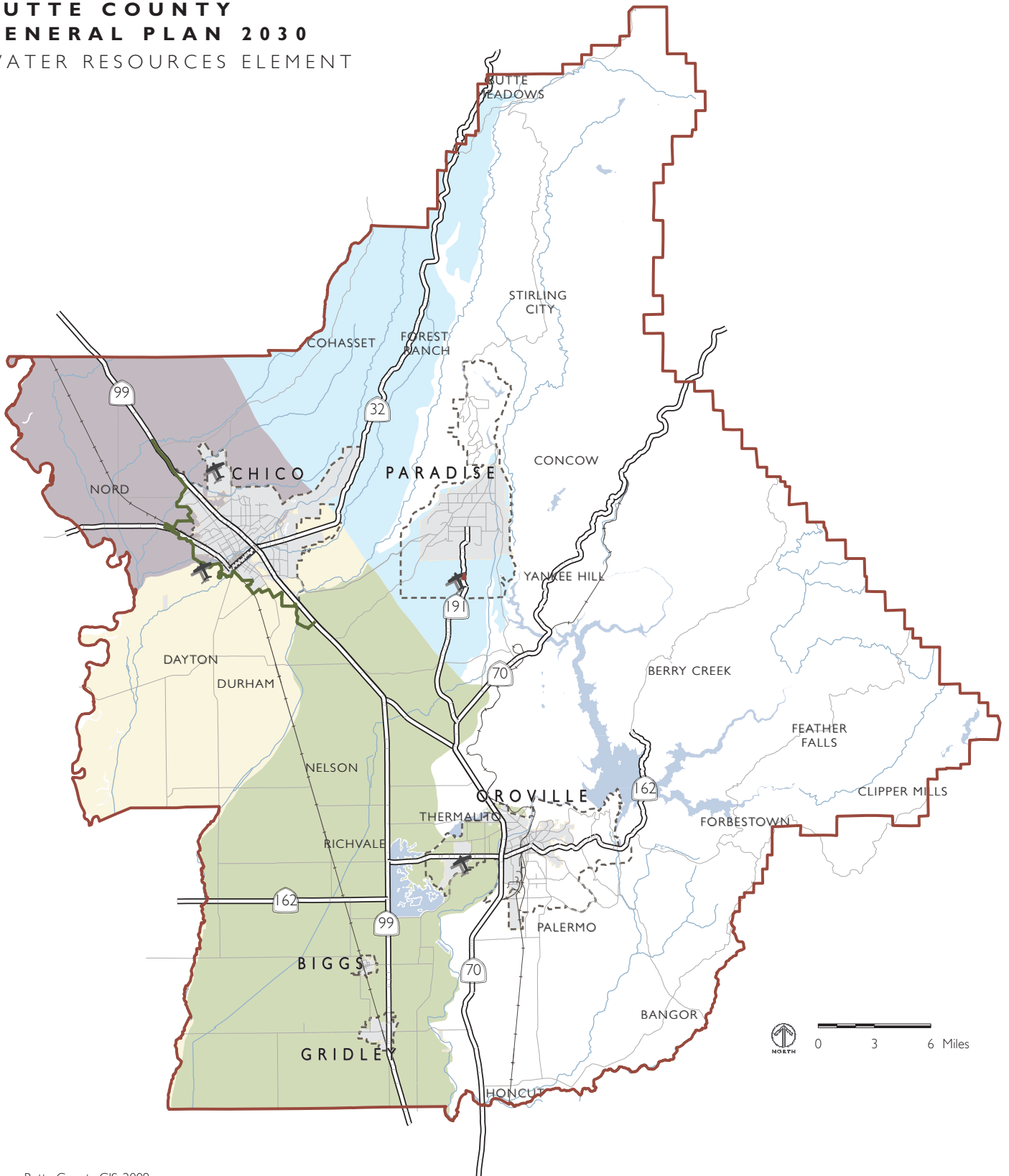
sells a portion of their State Water Project Table A allocation to the Del Oro Water Company and California Water Company – Oroville.

b. Groundwater

Approximately 75 percent of the residential water supply is extracted from groundwater. The availability of groundwater in an area depends largely upon its geologic, hydrologic and climatic conditions. In Butte County, reserves of groundwater are found in the thick sedimentary deposits of the Sacramento Valley and the mountainous areas to the east and north. Groundwater is found in perched, unconfined and confined zones in the valley portion of Butte County. Perched groundwater zones are most common in shallow, consolidated soils with low permeability. Major portions of groundwater are unconfined or semi-confined, occurring in floodplain and alluvial fan deposits. High permeability in these soils yields large amounts of water to shallow domestic and irrigation wells. The Tuscan Formation contains an important deep aquifer that is theorized to underlie most of the valley area. Confined water occurs in the Tuscan and Laguna Formations, and in the younger alluvium, where it is overlain by flood basin deposits. Although moderate amounts of water are yielded from the fine-grained strata of the Laguna Formation, permeable sand and gravel zones are infrequent and minor in extent and thickness. The highest producing wells in alluvial uplands occur when older alluvium or the deeper Tuscan volcanic rocks are tapped. Groundwater can also be found in more limited amounts in mountainous areas of the county within volcanic, metamorphic and granitic rock with a total volume of water stored estimated to be less than 2 percent of the rock volume.

Figure W-1 maps the Sacramento Valley groundwater basin and its subbasins, which are found within the western portion of Butte County; groundwater in the eastern portion of the county is found in more limited amounts within volcanic, metamorphic and granite rock.

**BUTTE COUNTY
GENERAL PLAN 2030
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Source: Butte County GIS, 2009.
 Note: Groundwater in the eastern portion of the county is found in limited amounts within volcanic, metamorphic, and granite rock.

Sacramento Valley Groundwater Basins	Airports	Major Roads
East Side Basin	Greenline	Sphere of Influence
East Butte Subbasin	Highways	City/Town Limits
Vina Subbasin	Railroad	County Boundary
West Butte Subbasin		

FIGURE W-1
GROUNDWATER BASINS AND SUBBASINS

The major sources of groundwater recharge in Butte County are precipitation, infiltration from streams, subsurface inflow and deep percolation of applied irrigation water in agricultural areas.

Throughout a large portion of Butte County, fresh water reportedly extends to a depth of 800 to 1,350 feet below the ground surface, though groundwater levels can change due to extraction and natural processes. Change in groundwater storage is dependent on the annual rate of groundwater extraction and the annual rate of groundwater recharge, which commonly fluctuate within a given year and from year-to-year. During periods of drought, groundwater in storage typically declines, but it increases during periods of above normal precipitation. Groundwater storage also declines during the summer as groundwater is extracted for municipal and agricultural use, and recovers as extraction slows and seasonal precipitation increases recharge. There has been very little change in groundwater levels in most areas of the valley since the 1970s and 1980s. However, groundwater has declined over the past several years in specific areas, and long-term comparison of groundwater levels from the 1950s and 1960s with today's levels indicates a trend of slightly declining groundwater levels in some areas of the West Butte and Vina subbasins.

The Butte County Department of Water and Resource Conservation has monitored groundwater quality since 2002 in response to the Butte County Groundwater Conservation Ordinance, Chapter 33 of the Butte County Code, which is described in detail in Section A.3, below. These efforts, in addition to monitoring by other State and federal agencies, such as the State Water Resources Control Board and the federal Toxic Substances Control Board, indicate that Butte County's groundwater is of high quality, free of saline intrusion and generally in good health.

Groundwater quality in the Middle Sacramento Valley area was investigated from June through September 2006 by the United States Geological Survey under the California Groundwater Ambient Monitoring and Assessment

(GAMA) program. The investigation included analysis of water quality data from 108 wells throughout Butte, Colusa, Glenn, Sutter, Tehama, Yolo and Yuba Counties. All volatile organic compounds (VOCs), pesticides and their degradates, perchlorate and radioactive constituents were found to be at levels below health-based thresholds.

Nitrate contamination of groundwater in the Chico area, caused primarily by discharges from individual septic systems, has been a longstanding concern for the County. The Nitrate Compliance Plan, which was adopted by the Board of Supervisors on September 25, 2001, includes strict density requirements for new septic systems, allowing for conventional septic systems only in narrowly defined circumstances.

2. Water Supply and Demand

In 2001, Butte County conducted a comprehensive inventory of its water resources and evaluated its overall water supply in the document entitled Butte County Water Inventory and Analysis. The County updated the Butte County Water Inventory and Analysis in 2008. The Butte County Water Inventory and Analysis indicates that the majority of the water demand in Butte County occurs in the valley areas due to the concentration of urban populations and farming. Agricultural water needs constitute 71 percent of the total demand in all of Butte County, including the incorporated municipalities.²

The Butte County Water Inventory and Analysis indicates that there is no water supply shortfall during normal years, but that shortages occur during dry conditions in specific areas. Drought period shortages are concentrated in the southwestern portion of the County, where supply is limited by groundwater fluctuations during drier summer months, heavier agricultural use and the geology of the aquifer.

² Butte County Integrated Water Resources Plan, <http://www.buttecounty.net/Water%20and%20Resource%20Conservation/Butte%20IWRP/IWRP.aspx> accessed on July 30, 2009.

Users in certain parts of the county rely on groundwater pumping as an alternative to importing water from outside the county. According to investigations by the United States Geological Survey documented in the 1977 Safety Element of the previous Butte County General Plan, the areas of heaviest groundwater withdrawal extend about 2 miles north and south of Chico and in a 1-mile radius around Gridley. Groundwater pumping can lead to land subsidence; however, there are no known incidents of subsidence in Butte County to date.

3. Butte County Water Resource Management Efforts

Butte County is involved in many on-going efforts to protect and conserve its water resources. This section discusses organizations, processes and programs with which the County is involved that aim to manage its water resources quality and supply.

- ◆ **Butte County Water Commission.** The Water Commission meets regularly to discuss water issues in the County and provide recommendations to the Board of Supervisors for actions related to water resources. There are nine members of the Water Commission who serve four-year terms. Water Commissioners are appointed by the Butte County Board of Supervisors. Each Supervisor district has a Water Commission representative that is nominated by the Supervisor from that district. The remaining four members are appointed at large, of which two are landowners of property served by district water and two are landowners served by private wells. The Water Commission is charged with specific responsibilities in regard to implementing the Groundwater Conservation Ordinance and Groundwater Management Ordinance and providing a venue for public input on water issues.
- ◆ **Butte County Department of Water and Resource Conservation (BCDWRC).** The mission of the BCDWRC is to manage and conserve water and other resources for the citizens of Butte County. BCDWRC is involved in a wide range of activities focused on water resources monitoring and planning. The Department has developed some of the key

water resource planning documents for the County, including a Groundwater Management Plan, as required by AB 3030 regulations, and a countywide IWRP. BCDWRC also provides support for implementation of Chapter 33 and Chapter 33A of the Butte County Code, the Groundwater Conservation and Management Ordinance. Other important roles include managing Butte County's 27,500 acre-feet of State Water Project allocation and associated local water supply contracts, assessing countywide water supply and demand for current and future users, developing and expanding the well-monitoring grid, partnering on resource conservation issues with the Butte County Resource Conservation District, participating in watershed planning activities with local watershed groups, and managing the groundwater flow model developed by the Butte Basin Water Users Association.

- ◆ **Butte County Public Health Department, Environmental Health Division (BCEH).** BCEH's mission includes protecting the environment for the benefit of current and future generations through public education guidance and regulatory oversight. BCEH cooperates with the well drilling industry and employs Best Industry Practices (BIPs) to place and construct water production and water monitoring wells in Butte County. BCEH is also responsible for protecting water resources by regulating the storage of hazardous materials, the proper disposal of wastewater and the proper disposal of all solid wastes within Butte County. BCEH has regulatory oversight for many of the smaller water providers in the county.
- ◆ **Well Drillers Advisory Group.** The Well Drillers Advisory Group is an informal group of licensed well drillers and pump contractors that meets quarterly to develop policy recommendations for implementation of Chapter 23B of the Butte County Code, Well Construction Standards.
- ◆ **Butte Basin Water Users Association (BBWUA).** The BBWUA was formed in 1992, partially in response to the 1987 to 1992 drought. The organization addressed planning and management of both groundwater and surface water resources.

- ◆ **Butte County Groundwater Conservation Ordinance (Chapter 33).** In November 1996, Butte County voters approved the Groundwater Conservation Ordinance, which is intended to conserve groundwater by regulating water transfers outside of the county that have a groundwater component. It requires a permit for both exportation of groundwater outside the county and groundwater pumping as a substitute for surface water exported outside the county. It prohibits permits for water transfers outside of the county if the proposed activity would adversely affect the groundwater resources within the county, including causing or increasing overdraft of the groundwater, causing or increasing saltwater intrusion, exceeding the safe yield of the aquifer or related subbasins within the county, causing subsidence, or resulting in uncompensated injury to overlying groundwater users or other users.
- ◆ **Butte County Groundwater Management Ordinance (Chapter 33A).** This ordinance includes the development and monitoring of basin management objectives (BMOs) associated with groundwater levels, groundwater quality and land subsidence. The BMO concept is a unique approach in Butte County's groundwater management planning. The BMOs consist of locally-developed guidelines for groundwater management that describe actions to be taken by well owners in response to well-monitoring data.
- ◆ **Butte County Integrated Water Resources Plan (IWRP).** The IWRP provides recommendations for water management policies, as well as programs and projects to implement those policies. The policies focus on local water resource issues and cooperative water management with other entities. The IWRP sets the stage for many of the County's water planning efforts.
- ◆ **Groundwater Modeling.** As noted above, the BCDWRC manages a detailed hydrologic model of the groundwater basin that was developed by the BBWUA. The BCDWRC has transferred the data to a revised model that is more widely used throughout the State. The revised groundwater model may be used to evaluate the effects of groundwater withdrawal or

land use changes within subbasins in the county and provide a comprehensive water resources planning tool.

- ◆ **Four-County Memorandum of Understanding (MOU).** Butte County participates in an MOU with the Counties of Colusa, Glenn, Tehama and Sutter to promote regional coordination, collaboration and communication about many shared water resources.

In addition to the resource management efforts listed above, the County coordinates closely with federal and State agencies, urban water agencies, irrigation districts, water districts, advocacy groups and other non-profit organizations.

4. Water Service Providers

Much of Butte County's residential, commercial and agricultural water needs are met through a network of local water providers, including municipal water departments, mutual water companies, investor-owned utilities, irrigation districts, systems serving a small number of connections and special districts. Municipal water departments, such as the Cities of Gridley and Biggs, provide water service to municipal residents, generally distributed in pipes along roads in the service area.

Mutual water companies are private corporations that perform water supply and distribution functions similar to public water districts. Investor-owned utilities are also involved in water supply activities, sometimes as an adjunct of hydroelectric power development. Irrigation districts ensure the delivery of sufficient water supplies for agricultural uses, though they may serve some residential and commercial uses. Irrigation district water is often conveyed in open ditch canals. Other special districts provide water service to residents of the unincorporated district area, who in turn are assessed by the district for their services.

Figure W-2 maps the service area boundaries of the various water systems and irrigation districts in Butte County. Not all mapped water agencies provide service throughout their service areas. In these and other areas without water service, on-site wells may provide water to individual parcels.

5. Storage Facilities

In addition to some natural wetlands, there are numerous developed impoundments that store some of the county's abundant surface water for water supply and provide flood protection. Oroville Dam and Reservoir on the Feather River is the second-largest water storage facility in California and is

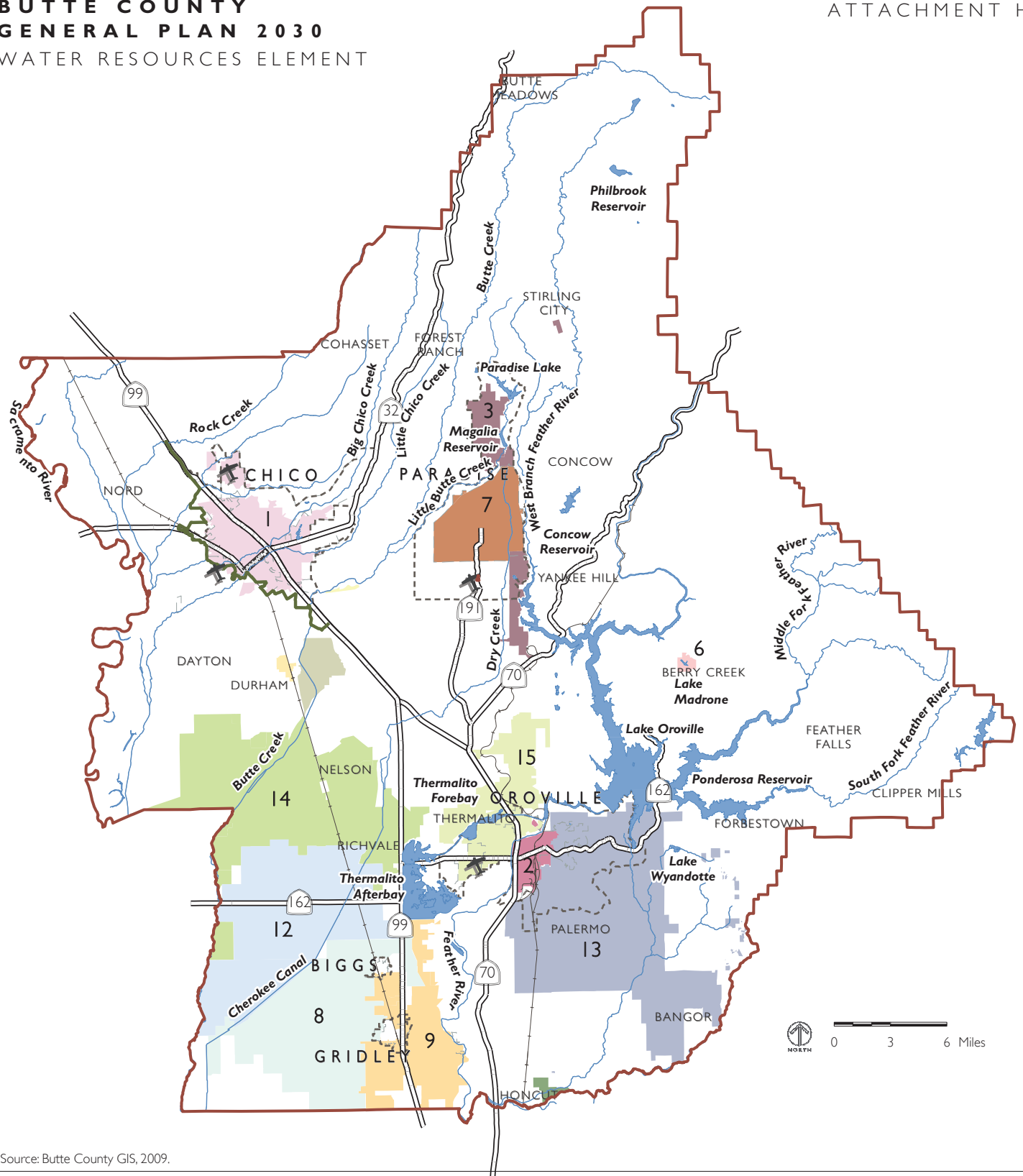
the initial and largest reservoir of the State Water Project. In addition to Lake Oroville, other water storage facilities in Butte County include the Thermalito Afterbay, Thermalito Forebay, Paradise Reservoir and Magalia Reservoir, as well as a number of other smaller water storage reservoirs.

6. Stormwater Management

As required by Phase II of the National Pollutant Discharge Elimination System (NPDES) of the United States Environmental Protection Agency (US EPA), Butte County operates under a Small Municipal Separate Storm Sewer Systems (Small MS4) stormwater permit. The County's Stormwater Management Program was developed as part of the permitting process and established stormwater-related priorities and activities for the period between



South Feather Water and Power Agency's Kelly Ridge Powerhouse penstock. Photo courtesy of the Butte County Department of Development Services.



Source: Butte County GIS, 2009.

1	California Water District - Chico	7	Paradise Irrigation District	13	South Feather Water & Power Agency		Greenline	
2	California Water District - Oroville	8	Biggs-West Gridley Water District	14	Western Canal Water District		Highways	
3	Del Oro Water Company	9	Butte Water District	15	Thermalito Water & Sewer District		Railroad	
4	Durham Irrigation District	10	Durham Mutual Water Company				Sphere of Influence	
5	Gran Mutual Water Company	11	Ramirez Water District				Lakes and Reservoirs	
6	Lake Madrone Water District	12	Richvale Irrigation District				Airports	
								City/Town Limits

FIGURE W-2
WATER PROVIDERS AND SERVICE AREA BOUNDARIES

2003 and 2008. The County was required to meet the goals of the Stormwater Management Program by July 2008. The County intends to regularly update the Stormwater Management Program.

The following goals were accomplished by the Butte County Stormwater Management Program:

- ◆ The building permit application process requires that land owners provide a signed statement to the Butte County Department of Development Services indicating that their projects disturbed less than 1 acre of undeveloped land, or, in the case of projects disturbing more than 1 acre, that they would comply with the State Construction Storm Water Program.
- ◆ Placards were installed to communicate the message that dumping into a County storm drain could pollute the groundwater or a nearby creek.
- ◆ The Clean Water Business Program was established, as well as an alliance with the Chico Urban Stream Alliance's Clean Water Business Partner program.
- ◆ Informational materials, including brochures and articles on stormwater issues, were distributed at public events and made available at government offices.

In addition, the County adopted the Butte County Stormwater Management and Discharge Control Ordinance under Chapter 50 of the Butte County Code. The ordinance provides the County with the legal authority to enforce various stated goals regarding water pollution to protect and enhance public health and the environment.

7. Streambank Stability and Riparian Resources

Streambank instability is a potential hazard along rivers and streams in Butte County. A streambank may be considered unstable if the slopes surrounding the stream are excessively steep and present a potential landslide hazard or if erosion is occurring at a relatively high rate. Seismically-induced ground

shaking also poses a threat to streambank stability, especially in areas where surrounding slopes are steep or where there is a large standing body of water below. Fire-related erosion can also lead to streambank instability when protective vegetation that anchors the land surrounding streams and in the watershed is lost to fire.

Human activity and development are other important causes of streambank instability. Best management practices have been developed and environmental regulations adopted to stabilize the banks, and to minimize near and in-channel disruptions, of streams and rivers in Butte County.

The Health and Safety and Conservation and Open Space Elements also discuss other issues associated with erosion, streambank stability and riparian resources.



Concow Reservoir. Photo courtesy of the Butte County Department of Development Services.

*B. Goals, Policies and Actions***Goal W-1** Maintain and enhance water quality.Policies

- W-P1.1 County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB).
- W-P1.2 The County shall cooperate with State and local agencies in efforts to identify and eliminate or minimize all sources of existing and potential point and non-point sources of pollution to ground and surface waters, including leaking fuel tanks, discharges from storm drains, auto dismantling, dump sites, sanitary waste systems, parking lots, roadways and logging and mining operations.
- W-P1.3 Regulations that protect water quality from the impacts from agricultural activities shall be maintained.
- W-P1.4 Where appropriate, new development shall be Low Impact Development (LID) that minimizes impervious area, minimizes runoff and pollution and incorporates best management practices.
- W-P1.5 Pest-tolerant landscapes shall be encouraged to minimize the need for pesticides.
- W-P1.6 Educational programs and outreach shall be continued to promote water quality protection and limit pollution from pesticides and nutrients in urban and domestic settings.

- W-P1.7 Agriculture, logging, mining, recreational vehicle use and other open space uses shall follow best management practices to minimize erosion and protect water resources.*
- W-P1.8 The County supports conversion from septic systems to public sewer service, where feasible.
- W-P1.9 The County supports the establishment of a system for proper disposal of expired medications.

Actions

- W-A1.1 Evaluate the expansion of the monitoring and reporting efforts of Butte County’s Department of Water and Resource Conservation.
- W-A1.2 Revise domestic well standards and programs to require water quality testing for the initial drilling of new domestic wells.
- W-A1.3 Develop standards to determine where Low Impact Development techniques are appropriate.

Goal W-2 Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policies

- W-P2.1 The County supports solutions to ensure the sustainability of community water supplies.
- W-P2.2 The County shall continue the Four-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama and Sutter Counties, and shall continue to foster regional cooperation with other counties and water purveyors.

- W-P2.3 Water resources shall be planned and managed in a way that relies on sound science and public participation.
- W-P2.4 The County's State Water Project allocation should be fully utilized within Butte County.
- W-P2.5 The expansion of public water systems to areas identified for future development on the General Plan land use map is encouraged.
- W-P2.6 The County supports water development projects that are needed to supply local demands.
- W-P2.7 The Butte County Water Commission and the Department of Water and Resource Conservation shall continue to be utilized as important partners in the water resource planning process.
- W-P2.8 The County supports Area of Origin water rights, the existing water right priority system and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy and environment.
- W-P2.9 Applicants for new major development projects, as determined by the Department of Development Services, shall demonstrate adequate water supply to meet the needs of the project, including an evaluation of potential cumulative impacts to surrounding groundwater users and the environment.*

Actions

- W-A2.1 Implement and periodically update the Integrated Water Resources Plan to ensure the sustainability of water resources within the county.

- W-A2.2 Develop criteria to implement Policy W-P2.9, including thresholds for the size of development project that triggers the need for an analysis of water supply and standards to demonstrate adequate water supply and evaluate impacts to surrounding groundwater users.
- W-A2.3 Encourage and cooperate with water purveyors to support the delivery of surface water for the economic development of agriculture.

<p>Goal W-3 Effectively manage groundwater resources to ensure a long-term water supply for Butte County.</p>
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Policies

- W-P3.1 The County shall continue to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality and avoidance of land subsidence, through a basin management objective program that relies on management at the local level, utilizes sound scientific data and assures compliance.
- W-P3.2 Groundwater transfers and substitution programs shall be regulated to protect the sustainability of the County's economy, communities and ecosystem, pursuant to Chapter 33 of the Butte County Code.
- W-P3.3 The County shall protect groundwater recharge and groundwater quality when considering new development projects.*

Actions

- W-A3.1 Seek funding for and conduct comprehensive, countywide mapping of water resources and groundwater recharge areas.
- W-A3.2 Evaluate gaps in existing federal, State and local standards, and develop additional standards as needed to preserve groundwater recharge and protect groundwater quality.
- W-A3.3 Cooperate with local water purveyors to seek funds to conduct a study to evaluate options to convey the County's State Water Project Table A allocation to areas not currently served by this source, such as the Chico area.
- W-A3.4 Seek funds and develop programs that improve the scientific understanding of regional aquifer systems and potential factors related to the sustainability of the county's water resources.
- W-A3.5 Continue to seek funding for and conduct scientific analysis of the costs and water supply impacts of increased groundwater pumping.

Goal W-4	Promote water conservation as an important part of a long-term and sustainable water supply.
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Policies

- W-P4.1 Agricultural and urban water use efficiency shall be promoted.
- W-P4.2 Water conservation efforts of local Resource Conservation Districts, the Natural Resource Conservation Service and irrigation districts should be coordinated.

- W-P4.3 The County shall work with municipal and industrial water purveyors to implement water conservation policies and measures.
- W-P4.4 Opportunities to recover and utilize wastewater for beneficial purposes shall be promoted and encouraged.
- W-P4.5 The use of reclaimed wastewater for non-potable uses shall be encouraged, as well as dual plumbing that allows graywater from showers, sinks and washers to be reused for landscape irrigation in new developments.
- W-P4.6 New development projects shall adopt best management practices for water use efficiency and demonstrate specific water conservation measures.*
- W-P4.7 County facilities shall adopt water conservation measures and when appropriate retrofit existing facilities to improve water conservation.

Actions

- W-A4.1 Develop a countywide graywater ordinance that includes best management practices for the reuse of graywater for non-potable uses.
- W-A4.2 Identify appropriate water use efficiency best management practices.

Goal W-5 Protect water quality through effective stormwater management.

Policies

- W-P5.1 The County shall continue outreach activities to inform residents and workers that illegal discharge into storm drains negatively impacts groundwater and surface water quality.
- W-P5.2 New development projects shall identify and adequately mitigate their water quality impacts from stormwater runoff.*
- W-P5.3 Pervious pavements shall be allowed and encouraged where their use will not hinder mobility.
- W-P5.4 Temporary facilities shall be installed as necessary during construction activities in order to adequately treat stormwater runoff from construction sites.*
- W-P5.5 Stormwater collection systems shall be installed concurrently with construction of new roadways to maximize efficiency and minimize disturbance due to construction activity.

Goal W-6 Improve streambank stability and protect riparian resources.Policies

- W-P6.1 Any alteration of natural channels for flood control shall retain and protect riparian vegetation to the extent possible while still accomplishing the goal of providing flood control. Where removing existing riparian vegetation is unavoidable, the alteration shall allow for reestablishment of vegetation without compromising the flood flow capacity.
- W-P6.2 Where streambanks are already unstable, as demonstrated by erosion or landslides along banks, tree collapse, or severe in-channel sedimentation, proponents of new development

projects shall prepare a hydraulic and/or geomorphic assessment of on-site and downstream drainageways that are affected by project area runoff.*

