

Colusa County General Plan Update Background Report

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Prepared for:



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DE NOVO PLANNING GROUP



A LAND USE PLANNING, DESIGN, AND ENVIRONMENTAL FIRM

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1. LAND USE AND DEMOGRAPHICS

This chapter examines the land use and development patterns in Colusa County. The information and analysis provided is intended to inform the General Plan Update process by providing both historical context and a baseline of existing land use and economic development information. This chapter provides an overview of existing land uses and community patterns, community character, agricultural trends and resources.

This report provides an overview of the land use and the community characteristics of Colusa County. “Community Character” refers to the physical characteristics that lend shape, form and identity to the community. Concepts such as “small town,” “quality of life,” “” and “community” are expressions of familiar physical characteristic –landmarks, streets, buildings, parks, and natural features that create a unique identity in every community.

This chapter is divided into the following sections:

- Land Use (1.1)
- Community Character (1.2)
- Agricultural Resources (1.3)

1.1 LAND USE

REGULATORY FRAMEWORK

The regulatory framework discussion and describes federal, state, and local laws and regulations that guide land use decisions. Adopted plans that pertain to federal lands, state planning law, and local jurisdictions in Colusa County are also described.

Federal

NATIONAL WILDLIFE REFUGES

Management of each National Wildlife Refuge is guided by the purpose of the individual refuge and the mission and goals of the Refuge System that includes the individual refuge, as well as U.S. Fish and Wildlife Service policy, laws, and international treaties. The National Wildlife Refuge System Administration Act of 1966, as amended by the Improvement Act, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations provide the federal laws for establishment and management of the refuges.

The Colusa, Delevan, and Sacramento National Wildlife Refuges are all part of the Sacramento National Wildlife Refuge Complex and are all guided by a single Comprehensive Conservation Plan (CCP). The Sacramento, Delevan, Sutter, and Colusa National Wildlife Refuges Final CCP guide the management of the Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges. The U.S. Fish and Wildlife Service manages the refuges as part of the Sacramento National Wildlife Refuge Complex.

MENDOCINO NATIONAL FOREST

The Mendocino National Forest Land and Resource Management Plan (LRMP) provides the framework to guide the ongoing land and resource management operations of the Mendocino National Forest. The LRMP’s goal is to provide a management program reflecting a mix of activities for the use and protection of the Forest. The LRMP:

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- Establishes the management direction and associated long-range goals and objectives for the Forest,
- Specifies the standards, approximate timing, and vicinity of the practices necessary to implement that direction, and
- Establishes the monitoring and evaluation requirements needed to ensure that the direction is being carried out, and to determine if outputs and effects have been reasonably estimated.

The LRMP is a strategic document that provides guidance for but does not make project level decisions. Those decisions are made after more detailed, site-specific environmental analysis and further public comment. The National Forest Management Act (NFMA) requires that resource plans and permits, contracts, and other instruments issued for the use and occupancy of National Forest System lands be consistent with the forest plan. The following are some examples of project decisions that require more detailed environmental analysis:

- Timber harvesting and related activities, such as slash disposal and road construction,
- Range allotment management plans,
- Fish or wildlife habitat improvement projects,
- Watershed improvement projects, and
- Developed recreation sites or trail construction.

The LRMP focuses primarily on management prescriptions for habitat, wilderness, and recreation uses. The LRMP anticipates a steady workforce and does not foresee the need for extensive construction of new facilities for administrative activities and to house the workforce, but rather anticipates that existing facilities will need to be maintained and improved.

The LRMP does not provide much direction regarding private development within the Mendocino National Forest. However, the U.S. Forest Service provides for special use permits for private activities. Special use permits may be requested from the U.S. Forest Service for a variety of land uses in national forests, including water transmission, agriculture, timber production, outfitting and guiding, recreation, telecommunication, research, photography and video productions, and granting road and utility rights-of-ways.

Recreation residences are also a federally permitted use in national forests. In 1968, a moratorium was placed on establishing additional residential tracts within forests and the moratorium was expanded in 1976 to also prohibit development of new lots within existing tracts. Existing recreation residences within a national forest are required to obtain a special use permit, which has a maximum term of 20 years. However, there is no guarantee that a new special use permit will be issued at the end of the permit term.

State

CALIFORNIA GENERAL PLAN LAW

Government Code Section 65300 requires that each county and city adopt a General Plan “for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning.”

The General Plan consists of a statement of development policies and includes a diagram or diagrams and text setting forth objectives, principles standards, and plan proposals. It is a comprehensive long-term plan for the physical development of the county or city and is considered a "blueprint" for development. The General Plan must contain seven state-mandated elements: Land Use, Open Space, Conservation, Housing, Circulation, Noise, and Safety. It may also contain any other elements that the County wishes to include. The land use element designates the general location and intensity of designated land uses to accommodate housing, business, industry, open space, education, public buildings and grounds, recreation areas, and other land uses.

The 2003 General Plan Guidelines, established by the Governor’s Office of Planning and Research (OPR) to assist local agencies in the preparation of their general plans, further describes the mandatory land use element as a guide to planners, the general public, and decision makers prescribing the ultimate pattern of development for the County.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) was developed to protect the quality of the environment and the health and safety of persons from adverse environmental effects. Discretionary projects are required to be reviewed consistent with the requirements of CEQA to determine if there is potential for the project to cause a significant adverse effect on the environment. Depending on the type of project and its potential effects, technical traffic, noise, air quality, biological resources, and geotechnical reports may be needed. If potential adverse effects can be mitigated, a mitigated negative declaration is required. If potentially adverse effects cannot be mitigated, an environmental impact report is required. These documents have mandated content requirements and public review times. Preparation of CEQA documents can be costly and, despite maximum time limits set forth in the Public Resources Code, can extend the processing time of a project by a year or longer.

Local

COLUSA COUNTY GENERAL PLAN

The Colusa County General Plan was adopted on January 13, 1989. Land uses in Colusa County have been developed based on the Land Use Map, goals, and policies established by the Colusa County General Plan. The foundations of the existing land use pattern are contained in the goals and policies created to:

- Maintain the efficient and orderly use of land;
- Avoid random and haphazard growth;
- Conserve and protect agricultural land; protect the qualities that contribute to a favorable quality of life;
- Develop and maintain an efficient circulation system;

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- Utilize the current transportation system as the framework for siting new industrial or commercial development;
- Improve and maintain the quality of services for local residents and businesses;
- Encourage an adequate supply of safe, sanitary, and attractive housing in all communities affordable to a wide range of income groups;
- Encourage a balanced mix of conservation, utilization, and development of the County’s natural resources;
- Preserve open space and opportunities for recreation and leisure-time activities;
- Maintain a high level of public health and safety for all residents of Colusa County

These guiding goals and policies are reinforced on the General Plan Land Use Map through the designation of significant agricultural lands, designation of urban land uses in and adjacent to established communities, locating the majority of industrial and commercial sites along the Interstate 5 and Highway 20/45 corridors, and providing significant recreational and open space areas that characterize the County’s quality of life.

Land Use Designations

Table 1.1-1 summarizes General Plan land use designations for unincorporated Colusa County by acreage and parcels. In some cases, a single parcel will have multiple land use designations, so the number of parcels listed in this table exceeds the total number of parcels as counted by the County Assessor. Land use designations adopted under the 1989 General Plan are shown on Figure 1-1. A brief description of each of the 1989 General Plan land use designations is provided below. These descriptions are based on the text of the 1989 General Plan.

AG - Agriculture-General: Land carrying this designation is generally used for orchard and crop production. Secondary uses in AG areas include oil and gas drilling, non-intensive recreation, agricultural industry (processing), and agricultural support uses, provided that these uses do not interfere with the

viability of agriculture or create environmental hazards. Residences in AG areas must be related to agricultural operations. The General Plan was amended in 2008 to increase the minimum lot size requirement for AG parcels to 40 acres.

TABLE 1.1-1: GENERAL PLAN LAND USE DESIGNATIONS		
Land Use	Parcels	Acreage
Agriculture-General	4,807	392,436.8
Agriculture-Transition	172	3,162.6
Agriculture-Upland	1,071	172,694.0
Commercial	313	513.2
Designated Floodway	302	13,002.0
Industrial	264	3,572.8
No Label*	261	3,692.5
Parks and Recreation	17	371.0
Public/Semi-Public Services	38	447.1
Resource Conservation	584	125,166.2
Rural Residential	1,655	3,515.9
Rural Service Center	102	514.9
Urban Residential	2,102	1,757.6
Upland-Transition	207	4,031.7
TOTAL	11,895	724,878.3

AT - Agriculture-Transition: The intent of the A-T designation is two-fold. First, A-T identifies areas where land has already been subdivided into small parcels (less than 10 acres) for ranchettes, part-time farms, and orchards. A-T serves as a transition zone between urban areas and the large-scale farms found in areas where large-scale agricultural operations are no longer feasible due to small parcel size or proximity to existing urban centers.

Second, A-T identifies vacant areas which may be suitable for urban uses in the future but which are not suitable at this time due to a lack of urban services and their distance from an established community. It may be appropriate to redesignate these areas for a more intense use based on market demand and development trends. Designating all of the A-T areas for development would be inappropriate since an oversupply of land would result (an oversupply would reduce the effectiveness of the plan, encourage urban sprawl, and raise urban service costs). These areas should not be extensively subdivided into small “ranchette” parcels that would prevent future urbanization.

AU - Agriculture-Upland: These lands are used for cattle and sheep grazing, and are intermixed with undeveloped, uninhabited forests, chaparral and grasslands. Secondary uses in AU areas include forestry, mining, and non-intensive recreation. Soils are generally fair to poor and are not conducive to crop production. Land divisions for non-agricultural purposes should be discouraged in these areas to prevent conflicts with ranching and to minimize exposure to natural hazards. The General Plan indicates that new parcels smaller than 80 acres should be prohibited and that, in some locations, it may be appropriate to raise the minimum lot size to 160 acres.

C- Commercial: Commercially designated areas include central business districts, highway commercial areas, hotels, offices, restaurants, shopping centers, and heavy commercial uses such as farm implement sales and auto salvage yards. The designation includes both built-up commercial areas and vacant areas suitable for commercial development.

DF- Designated Floodway: Lands within this classification have been designated as floodways by the State Reclamation Board. Areas between the Sacramento River and the levees are included, as well as the Colusa Bypass between the Sacramento River and Butte Creek.

I- Industrial: Lands designated industrial fall into two categories: existing industrial areas and vacant areas designated for industrial parks. The existing industrial areas contain agricultural support uses such as irrigation pipe yards, grain storage warehouses, rice dryers, and packing and distributing facilities.

The second category includes planned industrial areas in the I-5 corridor and the Colusa Sphere of Influence. Such areas are served by rail, interstate or state highway and have high visibility. These areas are to be developed as master-planned industrial subdivisions, rather than on a piecemeal basis.

RR - Rural Residential: This designation allows semi-rural living at an average density of one house per one to ten acres. The R-R designation is characterized by the following:

- Intended for areas where land ownership and parcel patterns preclude the use of land for agriculture.
- Preserve the attractive low-density character of the areas adjacent Colusa, Williams, Arbuckle, Maxwell, Princeton, and Stonyford and the partially developed non-sewered townsites and subdivisions such as College City and Century Ranch.
- Provide a buffer between urban uses and farmland.

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- Primary use of RR parcels is housing, with parcels usually large enough for backyard gardening or raising horse, but their owners do not derive their living from these activities.
- Smaller than A-T parcels.
- Distinguished from UR parcels by the lack of a central sewer system.
- New parcels smaller than one acre are not permitted.

PR- Parks and Recreation: Areas designated PR include golf courses, city, community and state parks, fairgrounds, and other recreational areas. At the present time, all of the PR areas are within communities. As in the case of public services, specific sites for future community parks are not presented on the land use map, but ample room has been provided in future residential areas for such parks.

PS- Public/Semi-Public Services: This category includes schools, libraries, churches, fire and police stations, corporation yards, water and sewage plants, migrant labor camps, lodges, electric power substations, and airports. The category only applies to existing public uses since the exact locations of schools, utilities, parks, etc will be determined as each respective community develops. As lands are converted to urban uses, sites for public/semi-public services would generally be provided within the land designated for Urban Residential uses.

RC- Resource Conservation: The RC designation is applied to forests and forested rangelands under federal ownership, to watershed lands requiring management and protection, and to the National Wildlife Refuges. In addition to forestry, acceptable uses on private lands within the RC designation include grazing, mining, non-intensive recreation and very low density residential uses. Also included as RC areas are the Colusa, Delevan and Sacramento National Wildlife Refuges.

RSC- Rural Service Center: The General Plan designates rural service centers at Sites, Delevan and Lodoga. These areas are very small, predominantly residential settlements. Growth potential in these areas is severely limited by the lack of urban services. However, all three communities contain a large number of existing vacant lots that are potentially buildable. Additional lot splitting in these areas is strongly discouraged. Commercial and residential uses are acceptable within RSC areas, provided such uses conform to the revised zoning map for each community.

UR - Urban Residential: This designation applies to existing and future residential areas where domestic sewer and water systems are available or can be made available. The UR designation allows R-1 to R-4 zoning classifications. Agriculture is an acceptable interim use. Residential support uses, such as schools and parks, are allowed.

UT - Upland-Transition: This designation is used to identify a limited number of areas near Stonyford and Lodoga. If access is sufficient, water is available, and the parcels meet the County's slope-density requirements, very low density residences (one unit per 10 acres) are an acceptable use. The intent of the UT designation is to create a transitional zone between rural-residential areas such as Century Ranch and Stonyford and the very large acreage ranches and wilderness areas.

COLUSA COUNTY ZONING ORDINANCE

Colusa County's Zoning Ordinance establishes land use zones and regulations for the use of land and buildings in the unincorporated areas of the County. The Zoning Ordinance was adopted in 1991 as Appendix I to the County Code.

COLUSA COUNTY AIRPORT COMPREHENSIVE LAND USE PLAN

The Colusa County Airport Land Use Commission adopted a Comprehensive Land Use Plan (CLUP) for the airport in 1995. The CLUP regulates land use in three major areas: safety zones, noise zones, and height restrictions. It provides land use compatibility guidelines for lands near the airport, to avert potential safety problems and to ensure unhampered airport operations. The CLUP establishes three safety zones that are linked to land use compatibility: clear, approach/departure and overflight. The clear zone is near each end of the runway and is the most restrictive in allowing land uses. The approach/departure zone is located under the takeoff and landing slopes, and is less restrictive. The overflight zone is the area under the airport's traffic pattern, and is even less restrictive (Colusa County ALUC, 1995).

Under California Government Code Section 65302.3(a), general plans must be consistent with any airport land use plan adopted pursuant to Public Utilities Code Section 21675. The Colusa County Airport Land Use Commission (ALUC) monitors compliance with CLUP provisions. The CLUP sets forth the following policies and implementation measures regarding future land uses:

- Implementation b: Upon adoption of this plan (CLUP), existing incompatible land uses may continue; however, no incompatible land use may be changed to another incompatible land use.
- Implementation c: Upon completion of this plan (CLUP), no incompatible land use, building, or structure may be expanded, except the following: Single-family detached residences
- Implementation e: Prior to the amendment of the general plan or specific plan, or the adoption or approval of a zoning ordinance or building regulation that would affect land that lies within the airport area of influence; the proposal must be submitted to the ALUC for review and determination of compatibility. Affected cities and counties are responsible for submitting the proposal to the ALUC.

LOCAL AGENCY FORMATION COMMISSION OF COLUSA COUNTY

In 1963, the State Legislature created a local agency formation commission (LAFCO) for each county, with the authority to regulate local agency boundary changes. Subsequently, the State has expanded the authority of a LAFCO. The goals of the LAFCO include preserving agricultural and open space land resources and providing for efficient delivery of services. The Colusa County LAFCO has authority over land use decisions in Colusa County affecting local agency boundaries. Its authority extends to the incorporated cities, including annexation of County lands into a city, and special districts within the County. LAFCO has the authority to review and approve or disapprove the following:

- Annexations to or detachments from cities or districts.
- Formation or dissolution of districts.
- Incorporation or disincorporation of cities.
- Consolidation or reorganization of cities or districts.
- Establishment of subsidiary districts.
- Development of, and amendments to, Spheres of Influence. The Sphere of Influence (SOI) is the probable physical boundary and service area of each local government agency. This may extend beyond the current service area of the agency.

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- Extensions of service beyond an agency's jurisdictional boundaries.
- Provision of new or different services by districts.
- Proposals that extend service into previously unserved territory in unincorporated areas.

In addition, the Colusa County LAFCO conducts Municipal Service Reviews (MSRs) for services within its jurisdiction. An MSR typically includes a review of existing municipal services provided by a local agency and its infrastructure needs and deficiencies. It also evaluates financing constraints and opportunities, management efficiencies, opportunities for rate restructuring and shared facilities, local accountability and governance, and other issues.

CITY OF COLUSA GENERAL PLAN

The City of Colusa adopted its General Plan in October 2007. The City's General Plan provides a comprehensive set of goals, policies, and implementing actions to guide the City's growth over a 20-year period. The City's General Plan states the following four fundamental purposes:

- To enable the Planning Commission and the City Council to make informed land use decisions that affect the City's quality of life.
- To inform the public of the City's policy approaches and to serve as a vehicle to invite public participation in the City's decision-making process.
- To provide a basis for evaluating whether private and public development proposals and public programs are in harmony with Colusa's short-term objectives and long-term vision.
- To provide private developers and public agencies with clear expectations of new development proposals to ensure their consistency with Colusa's development priorities.

The City's General Plan establishes allowed land uses for lands within the City limits and identifies planned land uses for the sphere of influence, which includes all land within the City and 1,668 acres outside the City limits. The General Plan identified eleven land use designations: Estate Residential, Low Density Residential, Medium Density Residential, High Density Residential, Urban Reserve, Commercial Professional, Mixed Use, Office Professional/Light Industrial, Parks/Recreation/Open Space, Industrial, and Public Facilities. The City's Land Use Diagram, which identifies adopted land uses in the City and SOI, is shown as Figure 1-2.

CITY OF WILLIAMS GENERAL PLAN

The City of Williams is in the process of updating its General Plan. The City's current General Plan was adopted in September 1988. The following primary land use goals are established by the General Plan:

- Land Use – Residential: The City of Williams will maintain a diversity of housing opportunities and land uses that will allow for moderate to fast population growth, and provide sufficient housing to meet demand from all income groups.
- Land Use- Commercial: The City of Williams will, where appropriate, retain and renew the existing commercially developed land with emphasis upon preservation of the downtown area and will provide for sufficient new commercial area to meet the needs of the City.

- Land Use – Industrial: The City of Williams will encourage industrial growth by providing sufficient land designated for heavy commercial, light industrial and heavy industrial uses.
- Land Use – Agricultural: The City of Williams will protect agricultural land uses from encroachment by residential land uses which are not compatible with agriculture.

The City of Williams General Plan establishes 14 land use designations: Rural Residential, Residential Low Density, Residential Medium Density, Residential Multi-Family, Residential-Professional, Commercial Retail, Commercial Heavy, Highway Commercial, Light Manufacturing, Heavy Manufacturing, Open Space, Agricultural Exclusive, Urban Reserve, and Public Use, which are shown on Figure 1-3. The William’s SOI anticipated annexation of lands to the west of the City as illustrated by Figure 1-4.

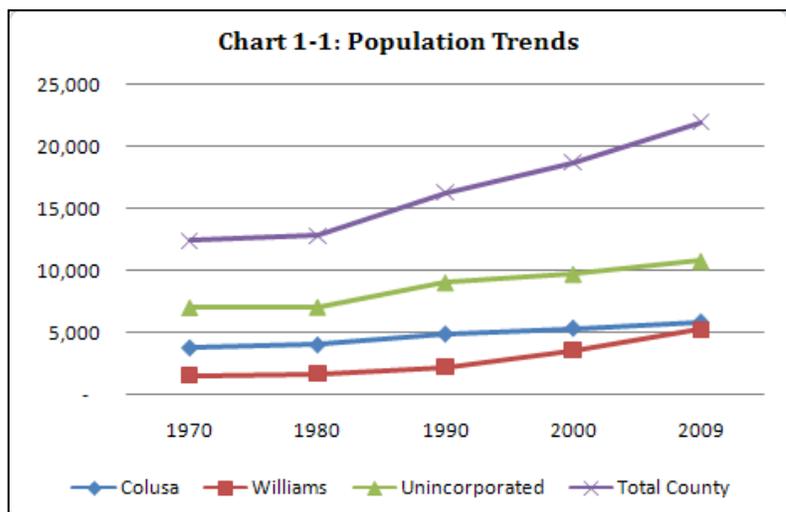
EXISTING SETTING

Existing land uses in Colusa County are primarily agricultural. The land use pattern is typical of rural counties of the Sacramento Valley. A checkerboard of large acreage farms dominates the eastern half of the County, with land ownership and road alignments following square mile section lines. The land is generally flat and is covered by fields of rice, orchards, and row crops. Views are expansive, framed only by the rolling foothills of the Coast Range on the west and jagged peaks of the Sutter Buttes on the east. As one moves west through the county, large farms give way to much larger cattle and sheep ranches, cultivated fields give way to arid rangeland, and the flat terrain transitions into rolling hills and spectacular upland valleys. Further west, the land becomes yet more rugged and wild, until finally reaching the summit of Snow Mountain in the wilderness area at 7,000 feet above the valley floor.

Urban patterns reflect the County’s long-time reliance on agriculture and its ties to the river and railroad for shipping agricultural goods. The first towns to develop in the County—Colusa, Grimes and Princeton—were loading points for barges carrying wheat down-river and overnight stops for stages making their way along the river road. Twenty years later, the next group of towns—Arbuckle, College City and Williams, developed as the Northern Railway made its way up the valley from Sacramento. Meanwhile, in the foothills and mountains, several short lived settlements thrived around mines and hot spring resorts in the late 1800s and early 1900s. By virtue of its designation as County seat, Colusa emerged early as the largest city in the County.

Population and Housing

Colusa County’s population has steadily grown over the last several decades as shown by Table 1.1-2 and Chart 1-1. Countywide, the population has increased by 77 percent since 1970 with the unincorporated area increasing by 54 percent from 7,017 to 10,790 persons. Both cities have grown during this period, with Williams showing a significant increase of 236 percent while Colusa’s growth rate has been comparable to the unincorporated area. Over the past



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decade, the population in the unincorporated increased from 9,732 to 10,790 persons, an increase of 11 percent. The average annual change in the unincorporated area from 1970 to 2009 is 1.1 percent.

The County’s population grew by about 5,722 or by 35 percent over the last twenty years, while housing grew generally at proportional levels. The largest population growth period occurred between 2000 and 2005 when the County grew by more than 11 percent. Interestingly enough, housing units grew by about the same amount during this four year period after 2005, but due to the 2007-10 economic decline, population growth declined from 11.5 percent to about 5.3 percent. Due to this recent economic decline, growth over the next few years is anticipated to slow, but then increase again. The California Department of Finance has projected that Colusa County will grow by 35 percent to 41,662 by the year 2050. This projected estimate is much more conservative compared to Colusa’s adjoining Counties of Sutter (176 percent) to the east, Glen (105 percent) to the north, Lake (58 percent) to the west, and Yolo (58 percent) to the south.

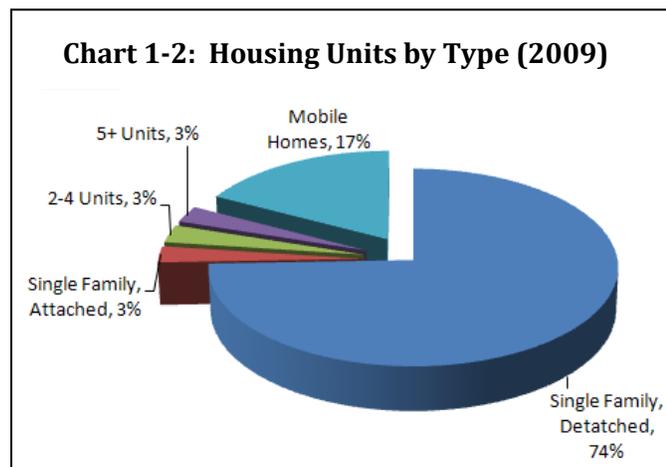
TABLE 1.1-2: POPULATION GROWTH – COLUSA COUNTY AND CITIES

	1970	1980	1990	2000	2009	1970-2009 Change	2000-2009 Change	Avg. Annual Change
Colusa	3,842	4,075	4,934	5,402	5,889	53%	9%	1.1%
Williams	1,571	1,655	2,297	3,607	5,276	236%	46%	4.8%
Unincorporated	7,017	7,061	9,044	9,732	10,790	54%	11%	1.1%
Total County	12,430	12,791	16,275	18,741	21,955	77%	17%	1.6%

SOURCE: DEPARTMENT OF FINANCE, 2009

Over the past decade, growth in the unincorporated area has been spread throughout the County, with significant amounts of growth occurring in Arbuckle, the rural area south of Arbuckle and west of I-5, and to the north and west of Colusa. Growth in individual communities is described below under Community Character.

There are 7,864 housing units in the County, with 4,230 in the unincorporated area. The majority of housing units in the unincorporated area are single family, with mobile homes comprising the second largest type of housing unit (see Chart 1-2). The vacancy rate in the unincorporated area is 13.6 percent, which means 3,656 of the housing units are occupied. The 3,656 households in the unincorporated area have an average household size of 2.93 persons.



Detailed demographical information discussing the characteristics of the County’s population, households, and housing units is provided in the Housing Element Update Background Report (draft May, 2010).

Land Use Patterns

When discussing land use, it is important to distinguish between planned land uses and existing land uses. The General Plan land use designations identify the long-term planned use of land but do not

present a complete picture of existing land uses. Land uses in Colusa County have been historically categorized a number of different ways. Existing land uses can be characterized in broad terms of agricultural cropland, rangeland, national forest and wildlife refuges, rural settlements, developed communities, and cities. As shown in Table 1.1-3, approximately 78% of the County’s total land area is devoted to cropland or underdeveloped rangeland based on the information from the California Department of Conservation. Twelve percent is in the national forest and national wildlife refuges. Approximately 85,187 is considered other lands, which include roadways, parkland, governmental/semi-public uses, industrial , commercial, and agricultural processing facilities located outside of developed communities and not included in the other categories. Less than one percent is devoted to urban and rural communities.

Land Use Category	Acreage	Percent
Cropland	558,591	75%
Grazing Lands *	9,030	1%
National Forest	72,000	10%
National Wildlife Refuge	12,000	2%
Incorporated Cities	2,574	0.3%
Communities*	2,750	0.4%
Rural Subdivisions and Settlements **	1,200	0.2%
Other Lands	85,187	11%
Water Areas	2,000	0.3%
Total	740,932	100%

SOURCE: COLUSA COUNTY DEPARTMENT AGRICULTURAL

**Lands within the communities of Arbuckle, Maxwell, Princeton, Grimes, Stonyford, and in the unincorporated areas adjacent Colusa and Williams*

***Includes vacant lots within Century Ranch and East Park Lake View Areas*

The Colusa County Assessor’s office categorizes lands at a more detailed level than the Department of Agriculture based on actual land use. The Assessor’s land use and related improvements provides the basis for tax assessments. While this data is not complete for the County (approximately 14 percent of lands are unclassified and an additional 1.6 percent is classified as miscellaneous), this data is useful for determining land use at a greater level of detail than the information from the Department of Agriculture. Table 1.1-4 summarizes land uses based on the County Assessor’s data. Almost 80 percent of the land in Colusa County is used for agricultural purposes, based on Colusa County Assessor’s data. Government lands, which include the wildlife refuges, account for 4.5 percent land uses. Residential, commercial, industrial, and other urbanized/rural settlement uses account for less than 1 percent of the land area in the unincorporated County. Lands categorized vacant 2,526 acres (0.3 percent).

Focusing on the developed categories of residential, commercial, and industrial, which together comprise 0.8 percent of the total land in the County, residential uses comprise the majority of these developed land uses with 4,120 acres. Commercial and industrial uses each account for 0.1 percent of total lands, with 775 and 419 acres, respectively.

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URBAN AND RURAL COMMUNITIES

The county’s two incorporated cities—Colusa and Williams—encompass about 2,574 acres. Adjoining these cities in the unincorporated area, there is another approximately 600 acres of developed acreage with about 1,500 acres of land potentially developable. The largest unincorporated town and third largest community in the County, Arbuckle, is somewhat smaller than Williams. There are five other unincorporated communities in the County, each originally laid out with narrow rectangular lots along a grid of right-angled streets. Maxwell is the largest of these communities, followed by Princeton, Grimes, Stonyford and College City. Together, these established incorporated and unincorporated towns cover a total area in “urban” uses of about 5,451 acres with a population that exceeds 17,000. This urbanized area has more than doubled in size over the last twenty years by 2,900 acres. The majority of urbanized and potentially urbanized areas in the County consist of residential use. Table 1.1-5 provides a distribution of land use between the various communities.

TABLE 1.1-4: ASSESSED LAND USES – UNINCORPORATED COUNTY

Use Description	Parcels	Acres	% of Acres	Dwelling Units	Non-Residential Square Footage
Agriculture					
Agricultural	4,349	312,859	43.2%	420	2,341
Agricultural Preserve	1,710	258,336	35.6%	39	194,980
<i>Subtotal - Agricultural</i>	<i>6,059</i>	<i>571,195</i>	<i>78.8%</i>	<i>459</i>	<i>197,321</i>
Commercial					
Bank	2	0.7	< 0.1%	0	8,578
Commercial	125	734	0.1%	14	318,242
Medical/Dental/Labs	6	3	< 0.1%	0	6,629
Office	6	5	< 0.1%	0	0
Hotel, Motel, Resorts	1	4	< 0.1%	0	4,022
Restaurant	19	19	< 0.1%	0	60,190
Retail Sales	38	8	< 0.1%	0	95,008
<i>Subtotal - Commercial</i>	<i>197</i>	<i>775</i>	<i>0.1%</i>	<i>14</i>	<i>492,669</i>
Industrial					
Automotive Uses	27	21	< 0.1%	0	62,347
Industrial	40	398	0.1%	0	117,356
<i>Subtotal - Industrial</i>	<i>67</i>	<i>419</i>	<i>0.1%</i>	<i>0</i>	<i>179,703</i>
Residential					
Mobile/Manufactured Home Park	7	12	< 0.1%	68	0
Mobile/Manufactured Homes	55	89	< 0.1%	86	0
Multiple Family	125	435	0.1%	423	0
Single Family	2,268	3,276	0.5%	2,268	0
Residential	75	308	< 0.1%	61	30,455
<i>Subtotal - Residential</i>	<i>2,530</i>	<i>4,120</i>	<i>0.6%</i>	<i>2,906</i>	<i>30,455</i>
Government					
Government	437	32,841	4.5%	0	20,250

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TABLE 1.1-4: ASSESSED LAND USES – UNINCORPORATED COUNTY

Use Description	Parcels	Acres	% of Acres	Dwelling Units	Non-Residential Square Footage
Recreation					
Recreational	4	143	< 0.1%	0	21,896
Other Categories					
Miscellaneous	214	11,258	1.6%	0	56,471
No Category Assigned	614	101,602	14.0%	0	0
Vacant					
Vacant	1,773	2,526	0.3%	6	0
TOTAL	11,895	724,878	100.0%	3,385	998,765

SOURCE: COLUSA COUNTY ASSESSOR, 2009; DE NOVO PLANNING GROUP, 2010

TABLE 1.1-5: DESIGNATED LAND USES BY COMMUNITY (UNINCORPORATED AREA)

Land Use	Arbuckle		College City		Colusa		Grimes	
	Acres	Parcels	Acres	Parcels	Acres	Parcels	Acres	Parcels
Commercial	33.5	74	4.8	15	90.9	17	9.8	26
Industrial	61.8	30	139.5	9	799.8	19	7.6	12
No Label¹	46.0	7	-	-	27.4	4	-	-
Parks & Recreation	24.8	3	7.9	2	252.4	10	-	-
Public/Semi-Public	77.5	8	-	-	159.9	3	6.3	2
Rural Residential	140.8	83	57.7	123	580.6	124	20.2	14
Urban Residential	319.1	928	-	-	529.2	399	39.6	102
Total	703.5	1,133	209.9	149	2,440.2	572	83.5	156
Community Breakdown								
Land Use	Maxwell		Princeton		Stonyford		Williams	
	Acres	Parcels	Acres	Parcels	Acres	Parcels	Acres	Parcels
Commercial	285.5	105	4.8	20	7.9	25	76.0	17
Industrial	749.5	32	-	-	-	-	277.4	18
No Label¹	122.2	13	-	-	-	-	92.8	6
Parks & Recreation	-	-	-	-	-	-	10.6	1
Public/Semi-Public	19.6	3	30.7	11	141.3	10	11.8	1
Rural Residential	1,002.0	25	-	-	76	100.8	402.8	30
Urban Residential	278.3	403	78.0	131	-	-	513.2	138
Total	2,457.1	581	113.5	162	225.2	135.8	1,384.6	211

SOURCE: COLUSA COUNTY ASSESSOR DATA, 2009; DE NOVO PLANNING GROUP, 2010

¹No Label: This category includes all federal, state, and other agency lands that do not have a General Plan land use designation.

Approximately 60% of the population in the unincorporated County resides within the eight identified primary communities. Table 1.1-6 provides estimates of population within the various communities. About 73% of all residents living within the primary unincorporated areas are located in the three largest communities of Arbuckle, Colusa, and Maxwell. Arbuckle and the unincorporated areas of Colusa and

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Maxwell have experienced the greatest rates of growth over the last decade. More specific details of these urban communities are discussed later in this chapter under Community Character.

TABLE 1.1-6: COMMUNITY POPULATION, HOUSING UNITS, AND COMMERCIAL/INDUSTRIAL USES

Community	Population		Pop. Increase	Growth Rate	Housing Units ¹	Commercial/Industrial sq. ft. ²
	2000	2009				
Arbuckle	1,968	2,472	504	25.6%	962	104,892
College City	211	226	15	7.0%	88	7,818
Colusa Area	1,117	1,239	122	10.9%	482	127,387
Grimes	334	339	5	1.6%	132	21,113
Maxwell	999	1,015	16	1.6%	395	132,793
Princeton	379	398	19	5.0%	155	13,346
Stonyford/ Lodoga	464	501	38	7.9%	195	9,704
Williams Area	479	257	26	11.1%	100	21,771
Total	5,738	6,483	745	14.0%	2,464	438,824

SOURCE: U.S. CENSUS BUREAU 2000, CALIFORNIA DEPARTMENT OF FINANCE 2009, AND COLUSA COUNTY PLANNING AND BUILDING DEPARTMENT ESTIMATES BASED ON BUILDING PERMITS ISSUED.

¹Housing Units: Housing unit numbers are approximated based on Colusa County Assessor Data, which was extrapolated to the 2009 Department of Finance estimate of 4,230 units in the unincorporated area. These numbers include occupied housing units as well as seasonal residences, second units, and unoccupied housing units.

²Commercial and Industrial Square Feet (sq. ft.)

RURAL SETTLEMENTS

The remaining 4,265 people (41%) in unincorporated Colusa County live in isolated rural homesites, in small settlements with permanent populations of under 100 people, and on scattered farms. Only about three percent live in small rural communities. Some of the rural homesites are located on pockets of private land within the boundaries of the Mendocino National Forest. Others are scattered in the almond orchards southwest of Arbuckle, while still others are located in the Century Ranch and East of Park Lake View Acres in rural subdivisions near Stonyford.

The small settlements include Sites, Delevan, Leesville, Sycamore, Lambertville-Clarksville, Lodoga, and Millers Landing. Some of these communities were once considerably larger than they are today. With the growth of “agri-business”, the decline of the railroad, and the tremendous savings in travel time brought on by the automobile, the smaller farm towns have not been able to keep pace with the larger communities. For example, once a populated and prosperous community, Delevan now consists of a rice dryer and grain warehouse and less than one dozen homes. Leesville was once a stage stop on the steep road between Williams and the resorts of western Colusa County. The Leesville Hotel, built in 1878 and now a private residence, is all that remains of the town. Wilbur Springs, a historic hot springs resort on a 1,800 acre preserve, is active and maintains a permanent community of about 40 residents with guest accommodations. In this western part of the County where there were a number of active hot springs resorts, Wilbur is the last remaining in the County. The community of Sites was initially developed to serve a nearby stone quarry and was the terminus of a rail line from Colusa between 1886 and 1916. The railroad was never completed to Clear Lake as planned, and the hotel and school in Sites were eventually abandoned. Today, the community consists of about five homes and an abandoned park. Table 1.1-7 provides rough estimates of population and acres for these rural communities.

Lambertville was established as a duck hunting club and most of its 85 bungalows and trailers are occupied on a seasonal basis only. The dozen homes in adjoining Clarksville, also a duck hunting center, are occupied on a more permanent basis. Lodoga was initially developed as a strip of vacation cabins along the banks of Indian Creek. Sycamore was one of the County's first settlements but today is little more than a crossroads midway between Grimes and Colusa. Millers Landing consists of about a half dozen homes and a grain dryer along the river.

Community	Population	Land Area
Delevan	14	30 acres
Lambertville-Clarksville	26	26 acres
Leesville	6	10 acres
Miller's Landing	14	30 acres
Sites	10	30 acres
Sycamore	5	20 acres
Wilbur Springs	40	1,800 acres
Other Rural	4,114	NA
Total Rural:	4,229	NA

SOURCE: DE NOVO PLANNING GROUP, 2010

FARMS AND RANCHES

Stretching across the floor of the Sacramento Valley and into the foothills beyond are some 645 farms and ranches. Cropland occupies about 558,591 acres, or almost 75% of the County's total land area. Nearly all of the cultivated agriculture is located in the Sacramento Valley, but some farming also takes place in the upland Indian, Antelope, and Bear Valleys. Ranches occupy about 200,000 acres, just over one-quarter of the County's land area. A more detailed description of farming and ranching is found in Section 1.3, Agriculture Resources, of this report.

COMMERCIAL LANDS

The 1989 General Plan designates 513.2 acres of land on 313 parcels throughout the County for commercial uses. Assessor's data shows that 775 acres of land on approximately 197 parcels have existing commercial uses, including offices, medical offices, a bank, 19 restaurants, retail establishments, and other general commercial uses. These commercial sites are developed with approximately 492,669 square feet of facilities. Commercial uses in the unincorporated area are mainly located in Arbuckle and Maxwell, as well as the area north of Colusa. The smaller communities, Grimes, Princeton, and Stonyford, have community-serving commercial uses such as bars, restaurants, and convenience stores. Commercial and industrial uses in the unincorporated communities are described in greater detail under Section 1.2, Community Character.

INDUSTRIAL LANDS

The 1989 General Plan designates 3,572.8 acres of land on 264 parcels throughout the County for industrial uses. Assessor's data shows that 398 acres of land on approximately 40 parcels have existing industrial uses. Industrial lands are developed with approximately 179,703 square feet of facilities. As shown on Figures 1-1 and 1-5, centers of industrial activity are concentrated along the I-5 corridor and in the vicinity of Colusa. Industrial uses that complement agricultural activities are widely dispersed across the valley. Grain drying and storage facilities are located at several points along existing and abandoned

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railroad lines, I-5, and SR 45. A variety of industrial uses are in the vicinity of the Colusa County Airport, located south of the City of Colusa along State Route 20/45.

A number of quarries, which are not currently active, are located in the County and have historically been mined for limestone, sandstone, onyx marble, and other materials.

A PG&E Generating Station is located in the northern area of the County, about five miles northwest of Maxwell. The generating station is under construction and anticipated to be completed in 2010. The generation station and electrical switchyard comprise about 31 acres of a 100-acre parcel and will produce 660 megawatts of power, enough electricity to serve approximately 500,000 homes.

FOREST AND RESOURCE CONSERVATION LANDS

Over 35 percent of the county consists of forested rangeland, resource conservation lands, and National Forest lands. Much of the rangeland is owned by the Bureau of Land Management (BLM) or the Bureau of Reclamation. BLM Resource Management Lands are concentrated along the Lake County border, the Cortina Ridge, and on the chaparral-covered hills between Lodoga and the Antelope Valley.

The Colusa, Delevan, and Sacramento National Wildlife Refuges cover about 12,000 acres of the low-lying Colusa Basin and provide a haven for wildfowl in the Sacramento Valley Flyway. The Colusa County portion of the Mendocino National Forest covers over 70,000 acres, or about 10 percent of the county's total land area. Developed uses in the forest include the Fouts Springs Boys Camp and recreational facilities at Letts Lake. Use of the National Wildlife Forest lands are more thoroughly discussed in the Conservation and Open Space Elements of this plan.

Mendocino National Forest: The Mendocino National Forest (Forest) straddles the boundaries of Colusa, Glenn, Lake, Mendocino, Tehama, and Trinity Counties. The Forest is located in the eastern portion of the County and extends from the foothills to the eastern county line, encompassing Approximately 72,000 acres. The main features of the Forest are extensive backcountry areas with limited access, including the Snow Mountain Wilderness, and a variety of recreation uses, includes Off Highway Vehicle (OHV) trails, hiking trails, and campsites. The Stonyford Ranger District offices, located just east of Stonyford, provide administrative facilities and housing for forest workers.

Fouts Springs Probation Camp: The Fouts Springs Probation Camp for Boys is located in the County in a remote part of the Mendocino National Forest at the base of the mountain range. There is no secured fencing around the perimeter of the facility due to its remote location. The camp has dormitory-style residences and freestanding facilities such as a dedicated mess hall and dining area, and a classroom area. The current capacity of the camp is 60 juveniles and averages 58 youth daily (California Research Bureau, 2008).

Colusa National Wildlife Refuge: The Colusa National Wildlife Refuge is comprised of 4,567 acres, which includes seasonal marsh, permanent ponds, and uplands. Visitors can access the auto tour, walking trail, and photography blind. The refuge offers wildlife observation, seasonal hunting, photography, and environmental education opportunities.

Delevan National Wildlife Refuge: The Delevan National Wildlife Refuge consists of 5,877 acres, which include 4,600 acres of managed wetlands (summer wetlands and seasonally flooded wetlands) and 984 acres of unmanaged wetlands, grasslands, alkali meadows, vernal pools, and riparian habitats. Public recreation activities include photography and wildlife observation from perimeter roads and seasonal hunting on the southern portion of the refuge.

Sacramento Wildlife Refuge: The Sacramento Wildlife Refuge is located in northern Colusa County and southern Glenn County and consists of 10,819 acres. This refuge includes 7,086 acres of managed wetlands and 3,360 acres of unmanaged wetlands, grasslands, alkali meadows, vernal pools, and riparian habitats. The alkali meadow and vernal pool habitats on the refuge represent some of the largest remaining areas of this habitat type in California. The refuge has on-site headquarters and visitor center, as well as an elevated viewing platform and photography blinds. The refuge offers a variety of recreation activities, including hunting, wildlife observation, photography, environmental education, and interpretation.

Pending and Approved Projects

Many of the approved and pending development projects in the County, including the incorporated cities, have been placed on hold with the downturn in the economy. Several projects have been partially developed and are now developing at a slower pace or have ceased development. Table 1.1-8 lists recently approved and pending projects in the County of Colusa, as well as major projects in the incorporated cities with an emphasis on projects that would border the unincorporated area or involve annexation. The LAFCO has not received any annexation requests at this time. The last annexation that occurred in the County was the Hoblit Annexation in 2001.

TABLE 1.1-8: APPROVED AND PENDING DEVELOPMENT PROJECTS

Project	Description	Status
County of Colusa		
Reddington Ranch Arbuckle	Subdivision with 138 single-family residential lots and associated infrastructure for transportation and drainage purposes on approximately 34 acres.	Approved and map finalized. The site has been graded and partially constructed. 18 lots have been developed or are under construction; 120 lots remain to be developed.
Almond Ranch Estates Arbuckle	Subdivision with 23 single-family residential lots and associated infrastructure, and open space for drainage and recreation purposes on approximately 6 acres.	Approved and map finalized.
The Richter Group Maxwell	Project with 19 single family residential lots and associated infrastructure for transportation and drainage purposes on approximately 5 acres.	Tentative map approved.
Wildwood Estates Arbuckle	Subdivision with 31 single family lots on approximately 6 acres.	Approved and map finalized. The site has been graded and partially constructed. Five lots have been developed; 26 lots remain to be developed.
TOTAL	Approved: 51 acres; 23 single family lots developed or under construction, 188 single family lots remain to be developed.	
City of Colusa		
Brookins Ranch	161 acres, 586 single family homes, fire station, and supporting	Application to annex into the City of Colusa has been

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	parks/recreation uses.	withdrawn.
Walnut Ranch	Existing subdivision of 96 single family homes located in the unincorporated area.	Annexation into the City of Colusa has been discussed at various County and LAFCO Board meetings but a formal application has not been made to LAFCO.
Colusa Industrial Properties (CIP) South of the city	Annexation of existing industrial and commercial campus. Detailed project information was not made available.	CIP entered into a 15-year agreement with the City of Colusa in 2003 but ended up receiving entitlements through the County. In 2009, Mr. Hulbert of CIP approached the City regarding re-engaging the agreement. A formal application has not been made to LAFCO.
Riverbend Estates Northeast area – east of Bridge St/Market St	397-unit subdivision	Application is being processed.
Tennant Estates South area adjacent to Wescott	101 unit subdivision	Tentative map approved.
TOTAL	Approved: Approved 101 single family units. Pending: Approximately 1,000 single family units and supporting uses. Annexation: Pending annexation of 96 existing single family units.	
City of Williams		
Valley Ranch	Subdivision of approximately 550 single family residences.	Final map recorded. Approximately 370 units completed.
Meadowlands Subdivision	160-unit single family subdivision.	Tentative map approved.
George Estates	123-unit single family subdivision.	Tentative map approved.
McCarl Ranch	181-unit single family subdivision.	Tentative map approved.
V&R Investments – Unit 3	83-unit single family subdivision.	Tentative map approved.
Hotel Ruggieri Way	Approximately 100 room hotel.	Design review approved.
TOTAL	Approved: 370 single family units developed or under construction, 727 single family lots remain to be developed. One approved hotel remains to be developed.	

SOURCE: CITY OF WILLIAMS, 2010; CITY OF COLUSA ENGINEER'S REPORT, 2009; COLUSA COUNTY DEPARTMENT OF PLANNING AND BUILDING, 2010

1.2 COMMUNITY CHARACTER

CITY OF COLUSA

The City of Colusa, one of the two incorporated Cities in Colusa County, is the largest community in terms of population and land area in the County. It is located in the northeast section of the County next to the Sacramento River at the crossroads of Highway 20 and 45. Colusa is nestled in a bend of the Sacramento River with vast acreages of agricultural land extending beyond its boundaries. Colusa is adjacent to the 4,507-acre Colusa National Wildlife Refuge, which primarily consists of intensively managed wetland impoundments and serves as one of the primary wintering areas for waterfowl in the Sacramento Valley. Visually, the natural landscape extends far beyond the City's boundaries. The area's flat topography, with an approximate elevation of 52 feet above sea level, allows for expansive scenic views, including those of the Sutter Buttes to the east and the Coastal Range to the West. The area includes extensive agricultural lands at the perimeter of the City, riparian habitat along the Sacramento River, tree lined streetscapes that help define the City's urban boundaries and key entries along Highway 20/45. Colusa has an estimated population of 5,402 in the incorporated area and an additional 1,239 persons in the surrounding developed areas. The City had a growth rate of over 8 percent between 2000 and 2009.

HISTORY

Much of the County's early history is centered around Colusa, the seat of County government, culture, and commerce from gold rush days to the present. The City was laid out on the site of Coru, an Indian village contained within a Mexican land grant deeded to American explorer John Bidwell. Bidwell sold his 8,875-acre land grant to Colonel Charles Semple of Kentucky in January, 1850. Semple, his nephew Will Green, and carpenter E. Hicks arrived the same year, and laid out the town along a grid of thirteen blocks from east to west and twelve blocks from north to south. Streets were drawn at right angles to the riverbank.

The City's early future depended on its designation as the County seat and its establishment of the head of the navigable Sacramento River. It succeeded on the first count in 1853, after local voters chose Colusa over Monroeville (33 miles up-river) as their government seat. The City achieved its second objective during 1851 and 1852 when Colusa became the river terminus during the biggest gold producing years in the State's history. However, success was short-lived. When the river was deepened as far north as Red Bluff in 1853, businesses failed and merchants tore down their shops to sell the lumber. With the advent of agriculture in the valley and the end of the mining boom, Colusa regained its prominence as a shipping center. It was the effective head of navigation for wheat barges during the 1860s and 1870s.

The City was incorporated in 1868. Although incorporation attempts had been tried as early as 1855, it took chronic problems, such as squealing pigs and public drunkenness to persuade townspeople to establish the City. Shortly after incorporation, downtown streets were graded and sidewalks and gutters were installed. Still, not all were satisfied. In 1872, an attempt to dis-incorporate passed through the state legislature before being vetoed by the governor.

Much of the town was settled during the late decades of the 1800s and early 1900s. Elm, eucalyptus, walnut and orange trees were planted between 1875 and 1880. Many of the saplings have become towering shade trees today, providing Colusa with an amenity found in few their communities in the region. By the turn of the century, the City had become the trade center for much of the Northern

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Sacramento Valley. Construction of the Southern Pacific railroad diminished the reliance on the river for commerce, but did not reduce Colusa's importance as a processing and shipping point for grain.

Colusa has preserved a wealth of historic buildings, including the County Courthouse at 6th and Market Streets. Built in 1861, the building is the second oldest courthouse still in active use in California. Its Greek-revival architecture reflects the heritage of some of the County's first settlers who came to Colusa from the Deep South prior to the Civil War. Other buildings of historical importance include the old Colusa Grammar School and the old Colusa High School (now the Community Theater). Both are on the National Register of Historic Places.

LAND USE

Colusa is the largest community in Colusa County with City boundaries encompassing 1,174 acres and an additional 1,668-acre SOI with a total planning area of 2,842 acres.

Similar to the unincorporated areas of the County, the economic base of the City is tied to agriculture, particularly rice. The City's incorporated boundaries include over 2,000 housing units, primarily consisting of detached houses, however, over 20 percent consist of apartment units and mobile homes. Colusa has grown outward to the south from its historic commercial and residential core at the north end of town where the Sacramento River levee creates a formal urban boundary. An additional 400 homes are located in the unincorporated area. Most development in Colusa has been contained within the original grid of streets until the 1960s when the townsite was built out and peripheral land was developed with housing.

Development that has occurred since the 1960s has followed more modern suburban street patterns. Most of the residential growth, to the south has been along Wescott Road and Bridge Street, primarily in subdivisions consisting of 7,000 to 12,000 square-foot lots. However, a number of the newer subdivisions have been constructed more recently to the east of Wescott Road west of Highway 20/45 and north of the abandoned railroad tracks. Many of these have larger sized lots.

The City has two main retail districts. The first district consists of the central downtown area centered around 5th and Market Streets in the original core of the townsite. The other is on the east side of town east of Bridge Street (Highway 20/45) at Sioc Street where the 55,000 square foot Town and Country Shopping Center was developed a few years ago. A smaller commercial district is located along Fremont Street near 5th Street. While the shopping center has significant commercial square footage, underutilized commercial space remains around the shopping center as well as along J Street and parcels north of Market Street extending to the Sacramento River. Although the town is active with commercial business, there are significant vacant commercial buildings particularly in the central downtown area.

The City currently has about 15.5 acres of parkland and recreational acres. This does not include recreational areas of the high school or the Fairgrounds. The Colusa-Sacramento River State Recreation Area provides a passive recreation and boat launch facility. There is also a public golf course on the southeast portion of town near the airport.

Next to single family residential development, industrial use constitutes the largest land use in the City. However, only 20 acres of vacant industrial zoned land remain inside the City limits. Most agriculturally-related industrial uses in the City are located along Main Street near the river.

Established in 1961, the Colusa County Airport is the only public airport in Colusa County. It is located on about 81 acres within the City's boundaries. This airport serves limited light aircraft of up to twin engine size used for agricultural, personal and business purposes. It has a paved 3,000 foot long runway laid out in a northwest-southeast orientation adjacent to Highway 20/45. Other large-parcel uses are located to the south part of the town, including the Colusa County Fair Grounds and the High School.

Outside of the City limits, land uses are predominately residential and industrial. Residential uses are mainly rural residential uses located along SR 45 to the north and a mixture of rural residential and ranchette uses generally north and south of Lurline Avenue to the west of the City. Industrial uses in the unincorporated area near Colusa are primarily located in the vicinity of the Colusa Industrial Park and the Colusa County Airport, located to the southeast. Additional industrial and commercial frontage is available along SR 20. Colusa Industrial Park (CIP) has an assortment of industrial and commercial uses, as well as available office sites and lands zoned for light and heavy industrial uses. CIP's existing commercial uses include County government, business offices, and medical and dental facilities. CIP's industrial uses include multiple grain and rice processing facilities, tomato processing, particle board manufacturing, concrete and brick block production, a vegetable seed breeding facility, a mechanical assembly company, and a mushroom grower. Other businesses in these areas include farm equipment rental, and sales, a petroleum supplier, warehousing, rice milling and fruit drying. Over 1,000 acres of land are owned by Colusa Industrial Properties in this vast area north of the airport.

FOCUS AREAS

Growth in the unincorporated area around Colusa is likely to primarily occur in the Special Planning Areas (SPAs) designated by the City's General Plan (see Figure 1-2), which are described below.

SPA 2: SPA 2 consists of Brookins Ranch Estates; a 161.4-acre vacant site to the southwest of Colusa. It is bounded on the west by Will S. Green Avenue, on the north by Colusa High School, on the east by Tennant Estates subdivision (and approximately one-quarter mile west of Wescott Road), and on the south by the old railroad right-of-way. This site is designated Agriculture Transition (A-1) in the County General Plan, but has not been farmed recently. It contains farm buildings along with a house. The Brookins Ranch Estates project would involve development of approximately 600 detached dwellings, a fire station, neighborhood parks and some commercial development in a planned development scenario.

This area contains a mixture of residential, agricultural and agriculturally-related industrial uses. Adjoining the City limits along Ware Avenue between Third and Eighth Streets, there are about 30 homes on 1/4-acre lots. This area is similar in character to the adjoining residential neighborhood within the City limits. To the south, Fifth Street extends beyond the City limits for about one-half mile. Fifth Street faces deteriorating conditions with a mix of industrial and residential uses that have impacted neighborhood investment. There are signs of abandonment and blight in several sections of this neighborhood.

SPA 3: SPA-3 is a 310 acre site, known as the Vann Property, located adjacent to the western boundary of the City. The site is bounded by State Route 20 to the east and south, and agricultural land to the west and north. The site is currently designated Agricultural-Transition in the County General Plan with a small piece designated for commercial land use. This development would consist of a mix of uses, including a variety of about 1,200 dwellings (mostly detached houses) with some higher density residential, 25 acres of commercial, a school, and about 51 acres of parks/open space.

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The northern portion of this area continues to undergo a slow transition from orchard and field crop uses to rural residential uses. There are a number of older residential subdivisions close to the City with ¼ acre lots. There is also a 40 space mobile home park adjoining the City limits. The more recent development is occurring through small subdivisions of farms or orchards into smaller parcels for large house sites. The area still contains a viable agricultural base, but the acreage in agricultural production has declined steadily with the influx of “ranchettes”. There is also a 55-acre area lying east of the City limits and west of the Southern Pacific Railroad bed, between Lurline and Wilson Roads, within the SPA 3 area, that has its own unique set of planning challenges. This area has a number of legal, non-conforming residences (residences that were built before they were expressly prohibited by zoning), so there is a mix of industrial uses, underutilized buildings, and abandoned shacks interspersed with houses, that have resulted in some deteriorated conditions. Some of the planning challenges cited in the 1989 County General Plan is land use incompatibility problem with the strip of land one-half block wide running the length of 14th Street’s west side. This strip has been zoned industrial, but there is significant residential interspersed in and around the industrial uses. This incompatibility has led to lack of investment into the neighborhood.

SPA 4: SPA 4, Colusa Riverbend, encompasses approximately 442 acres northeast of the City, and is bounded by the Sacramento River to the north and east, Highway 20/45 to the west and Moon Bend Road to the south. This whole area is proposed for future subdivision development to accommodate up to 2,530 dwelling units. An additional contiguous 76-acre parcel is located inside the City limits and would be developed first.

This area was originally laid out as an extension of the 1850 Colusa townsite. On paper, at least seven of the east-west streets in the City were extended three blocks to the east. Only a few of these streets were constructed and many of the lots were consolidated. About 60 homes exist in this area, mostly along the Clay and Parkhill Streets. The homes are served by City water, but have private septic systems. This property is currently being used for a mix of agriculture, including a variety of row crops and orchards, but also contains a number of residents.

Commercial areas on the east side of Bridge Street, also within SPA 4, include the Town and Country Shopping Center which were annexed into the City in the 1990s. Most of the agricultural and residential territory in this area is still within the County. Crommer Avenue extends ¾ miles east to the river, providing access to several residences, orchards and a harvester manufacturer and two bulk oil plants. There is also an old rice storage building along the river at the end of Main Street.

SPA 5: SPA 5 is located south of the City and comprises about 137.5 acres of the 1,048 acre Colusa Industrial Properties site. The site is roughly bounded by Highway 20/45 to the east, Colusa Golf Club to the north, Wescott Road to the west, and agricultural land to the south. Although some of this area has undergone development of industrial uses, there are approximately 127 acres that are vacant and designated in the County’s General Plan for industrial use. Future planned uses consist of about 200 houses, an apartment complex, about 28 acres of commercial and about 56 acres of open space, part of which would include an expanded 18-hole golf course.

SPA 6: The fifth and last SPA is the Airport Influence Area, which consists of the Airport influence area and a portion of the Colusa Industrial Park—specifically, the Airport Safety Zones, which include the clear zone, approach/depart zone and overflight zone as delineated in the Colusa County Airport Comprehensive Land Use Plan. Most of the land in the overflight zone is either used for airport facilities or is in open space. A large area surrounding the overflight zone allows for residential development of up to one dwelling per five acres.

The City's proposed land use pattern in this area reflects the area's proximity to the Colusa Airport with general aviation facilities adjoined by support uses such as hangars, and light industrial uses. Aircraft noise and safety hazards have precluded significant residential uses near the runway. Most of the land between the City and the airport is contained within the Colusa Industrial Park. Developed uses consist of agriculture processing, a mini-storage warehouse, crop duster businesses, chemical supply companies, and a water pump and a well drilling business. Two professional office buildings house agricultural-service offices. There is also a sufficient number of large vacant parcels within the park to accommodate the City's projected industrial growth.

Walnut Ranch Subdivision: Just south of the City's boundaries, along Wescott Road, is the Walnut Ranch residential subdivision of about 96 homes. There are some remaining vacant lot sections of this subdivision that remain undeveloped. The residents of this area are working with the City to determine the feasibility of annexation, in order to receive City water and sewer services. Further south of the subdivision, south and east of SPA 2, smaller orchard parcels open up to more expansive fields of row crops. Lot splitting to the west of Walnut Ranch has created a few residential estate parcels with houses. Just south of Walnut Ranch and the City limits is about 150 acres of agricultural land used for row crops.

North of the River: The Sacramento River clearly defines the northern edge of Colusa. Land on the north bank is used for orchards and field crops with virtually no residences. The only developed uses here are a commercial boat landing and recreational mobile home park, both located south of the Colusa Weir.

CITY OF WILLIAMS

The City of Williams, one of the two incorporated Cities in Colusa County, is known as the gateway to the Northern California hunting and fishing mecca. Centrally located in Colusa County and in the heart of the Sacramento Valley between Sacramento and Redding with an approximate elevation of 82 feet above sea level the land in and around Williams is generally flat and ideal for farming and urban development. Williams has an estimated population of 5,287 in the City and approximately 257 persons in the unincorporated area. With a growth rate of over 44 percent between 2000 and 2009, the City is the fastest growing area in the County.

HISTORY

Williams was founded in 1874 and was first recognized as "Central" due to its proximity to the middle of the Sacramento Valley. In 1876 it was renamed Williams, when landowner W. H. Williams drew up plans for a town at the proposed Northern Railway depot site some 10 miles north of Arbuckle. By the time the tracks reached Williams in the early summer of 1877, the town was well on its way to becoming a major agricultural processing and distribution center. In his History of Colusa County (1891), Justus Rogers notes that the first buildings in Williams were "rude and hastily constructed". However, Rogers goes on to note that by the 1881s, the town sported handsome dwellings and substantial brick buildings.

The decline in river traffic on the Sacramento River and the redrawing of the County's northern boundary made Williams the county's transportation hub and geographic center. The town's early success was built on the railroad and the grain products grown in the surrounding farm areas. Rice and tomatoes became the predominant farm crops during the early 1990s. With the decline in rail traffic, the town has remained a transportation hub by virtue of its location at the crossroads of Interstate 5 and State Highway 20. Revitalized development in the downtown and newer suburban development along the east side of Interstate 5 is transforming Williams.

1. LAND USE AND DEMOGRAPHICS

LAND USE

Williams is the largest community along the 65-mile stretch of Interstate Highway 5 between Woodland and Willows and is the major stopping point for gas, food and lodging. It also has the largest area of developed commercial property in Colusa County. Commercial use reflects the large acreage devoted to freeway-dependent uses, such as motels, restaurants, and service stations. Predominately, however, the land use pattern reflects the town's historic orientation along the railroad and more recently its urban growth transition along the east side of Interstate 5. Williams is laid out along the north and south sections of the railroad where the historic business area extends perpendicular to the railroad along North 7th Street (the major east-west road and Old Highway 99). Residential neighborhoods lie north, south and west of the district. Overall, the City boundaries are well-defined between higher density urban uses inside the City limits and rural and agricultural uses around its perimeter.

The highway-oriented commercial businesses, which are concentrated at the northeast, and particularly the southwest and northwest corners of the Interstate 5/Business 20 ("E" Street) interchange and west towards the railroad tracks take up a greater land area than the older downtown historic area. Although these businesses serve the local population, their primary customers are highway travelers. On the west side of Interstate 5, highway oriented uses consist of several motels, a supermarket and a number of restaurants, variety stores, gas stations and offices. Commercial, industrial and public uses are intermixed along North 7th Street in the historic area. Moving further west on E Street by a few blocks, commercial, residential and public uses are intermixed with a central district that includes City Hall, the police and fire station, the library and a market. Most of the community's industries are located on parcels fronting the railroad. Williams' older housing stock is proportionally distributed between the north and south sides of E street by several blocks. Several large acreage uses stand out in the City of Williams. On the west side, the elementary, middle, and high schools share a common 40-acre campus. Other major land uses consist of two City parks, the Sacramento Museum, and 7 churches.

Major industrial uses include a feed mill, a grain warehouse, and a pole manufacturer. There is also a machine shop in the downtown and a number of trucking businesses and storage lots and gas wells along North 7th Street.

The more recent growth in the City has been on the east side of Interstate 5, where farmland is being converted to a variety of commercial or institutional uses and residential subdivisions. New fast food restaurants, gas stations and a motel have been constructed at the southeast corner of the interchange at Van and E Streets. Van Street then extends south to recently constructed residential subdivisions consisting primarily of single ownership houses built on separate lots. A new State Highway Patrol facility was also recently constructed and is in operation along the east boundary of the City at the northwest corner of E Street and Husted Road. A branch of Yuba Community College and the Colusa County Office of Education Facility are planned for the vacant land at the northeast corner of the interchange. All these changes have and will continue to modernize and change the character of Williams.

FOCUS AREAS

Relative to the Colusa County General Plan Update, particular areas of focus are those located outside the City limits. These include areas both inside and outside the William's Sphere of Influence (SOI). The City's incorporated boundaries cover approximately 1,400 acres (2.19 square miles) which is about two-thirds of the City's 1,900 acre SOI (approximately 3 square miles). Most of the unincorporated areas within the SOI (500 acres) are located to the south and east of the City's existing boundaries. Several of

these properties adjoin the City limits and may eventually be developed into more urbanized uses in accordance with the City's General Plan once they are annexed and City services are extended to them.

The I-5 Corridor: This area includes land east of the City's incorporated boundaries where there are several rural residences, agricultural storage buildings, a crop dusting airstrip, a petroleum products warehouse, a bus yard, rice and vine seed drying facilities and a few commercial supply businesses. These uses occupy small parcels and are very widely scattered along Husted Road, Crawford Road, Old Highway 99 and the Husted Lateral. Away from the roadsides, the large tracts behind the commercial buildings are used for agriculture.

The 1989 Colusa County General Plan for this area recommends that much of this land be designated for future industrial development. Its visibility from the highway, proximity to the railroad, and accessibility from I-5 make it ideally situated for industry.

The Southern Rural-Residential Area: To the south and southwest of Williams, fruit and walnut orchards on relatively small farm parcels have proven to be an attractive draw for rural-residential development. This area, which was once almost exclusively used for agriculture now contains about 80 rural non-farm residences on parcels averaging ½ to 5 acres. Most of the parcels have been created through small subdivisions. The smallest parcels adjoin the City limits, especially along Theater Drive and Venice Boulevard. Further south, residential uses have been less intrusive and the orchards are more predominant. The area also contains scattered commercial uses, including an irrigation pipe yard, a tow-truck company, a motel, a county corporation yard and a crop dusting landing strip just west of Husted Road.

As in other rural-residential areas in the County, the practice of housing development without sewer and water services is of particular concern immediately south of Williams. The need for public improvements will become greater in the City as the area continues to undergo a transition from agriculture to urban uses. At the same time, the more piecemeal and irregular the development pattern becomes, the more difficult it becomes to construct these improvements. Furthermore, the "ratcheted" development pattern results in many one to five acre lots and limits the availability of sites for larger-scale suburban housing development. These improvements will be needed to sustain future growth in Williams.

The rural residential area south of Williams has been designated for Urban Residential land uses in the 1989 Colusa County General Plan. It is expected that urban services will be extended to this area and eventually annexed to the City. The current County General Plan policy is to discourage further land subdivision in this area until the City annexes the territory.

The Northern and Northwestern Areas: There is limited urban development to the north and northwest of Williams. The only non-agricultural land uses are located immediately north of the City limits on Old Highway 99. This area includes gas storage tanks, a small RV park, and auto salvage yards. North of town, the Highway 20 bypass spans Old Highway 99, the railroad, and I-5. The City's wastewater treatment plant occupies about 40 acres just north of the bypass. The remainder of this area is used for rice and row crop farming.

ARBUCKLE

The unincorporated community of Arbuckle, elevation 141 feet above sea level, has an estimated population of 2,472, and is the fourth largest community and fastest growing community in Colusa County. Its proximity to large agricultural operations makes it a popular location for both industrial and

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residential investment for the expanding agricultural industry. Being located in the southern portion of the County, and due to its relatively close location to the Sacramento metropolitan area, Arbuckle has experienced strong residential growth between 1990 and 2009.

HISTORY

Arbuckle is one of the three Colusa County towns founded during the northern extension of the Southern Pacific Railroad in the late 1870s. When College City turned down the opportunity for a rail depot in 1875, Missouri farmer Tacitus Arbuckle invited the railroad to his 7,320-acre farm three miles to the west. Arbuckle donated the land and depot and sidings, laid out the townsite, and began selling small lots. By 1876, the community had 300 residents. Around town, landowners offered farmers up to 5 years free use of their land as an incentive to clear the land and render it suitable for crop production.

Arbuckle became a lively commercial center by the turn of the century. Its business district served wheat, sorghum, hay, bean, and barley farmers from the surrounding area, as well as wildcatters drilling for oil in the nearby foothills. The town was markedly different than neighboring College City, where drinking and gambling were prohibited.

Much of the cropland around Arbuckle was planted with almonds, during the early 1900s. Although only 150 acres were planted in almond orchards in 1911, about 11,000 acres had been planted by 1933. The increase in almond production was accompanied by extensive land subdivision to the south and west of town. Because almonds could be grown profitably on smaller parcels than field crops, large areas (such as the Reddington Ranch and Almondale subdivisions) were split into 10, 20, and 40 acre parcels. Large parcels continue to be developed as “hobby farms” or ranchette sites for families seeking country living places.

Arbuckle’s commercial district entered a long period of decline beginning with the construction of Interstate 5 in 1957. The Interstate bisected the town, diverting through-traffic away from Fifth Street (Old Highway 99W) and dividing the town into “east and west” halves. The downturn in the farm economy has also affected many of the town’s businesses. However, large increases in the town’s population have created a demand for new retail and service establishments.

The Arbuckle Revitalization Committee and Arbuckle Parks and Recreation District have worked jointly to revitalize the downtown area of Arbuckle through investment in the community’s parks and recreation facilities. Since 1999, the two committees have created the “Wee Park,” a beautification project at the intersection of Old Highway 99 and Hillgate Road. The “KIA Memorial Park” in downtown Arbuckle recognizes local residents killed during a foreign war. The “Lavanch Hursh Park” is being developed in the downtown area with picnic areas, a covered pergola for events in the park, and central location for community events.

LAND USE

Arbuckle’s current land use pattern reflects its origin as a railroad depot and agricultural processing center. Grain warehouses, almond processing facilities, farm implement dealers, and fertilizer outlets are among the land uses abutting the railroad along the east side of I-5. Some of the storage and processing buildings are vacant and in poor condition. Several parcels are vacant or used for farm equipment storage only. Older residential development is concentrated to the east of I-5 of the downtown and generally between I-5 and 10th Street to the west.

Newer subdivisions are concentrated to the west of I-5, primarily south of Hillgate Road and northeast of Almond Avenue and Hall Street. With the slowdown in the economy, there are also several partially constructed subdivisions with finished residential lots that provide opportunity for development of 146 single family units at Reddington Ranch (northwest of Almond Avenue and Hillgate Road) and Wildwood Estates (southwest of Wildwood Road and Hillgate Road).

FOCUS AREAS

Central Arbuckle: One-half block to the west and parallel to the railroad, Fifth Street is the town's principal commercial district. The business district extends for about five blocks along Fifth Street between the railroad and I-5. The area is characterized by one and two-story masonry buildings dating from the early 1900s, including the Oddfellows Hall, the Reddington Block and the Arbuckle Hotel, and more contemporary buildings such as the Post Office, an auto parts store, a grocery store and a bank. Many of the older buildings are vacant or underutilized.

North and south of the business district, the area between I-5 and Fifth Street is predominantly residential. A central park has recently been improved with a large covered area for community gatherings at the east sides of Fifth Street at Hall Street. The Central Area includes about 30 houses and some apartments. Each of Arbuckle's freeway interchanges (north and south of town) is adjoined by a gas station and vacant commercially-zoned land.

East Arbuckle: East of the railroad, a grid of streets eight blocks long and between two and five blocks wide comprises "East" Arbuckle. This area is mostly residential, consisting of about 200 houses. The development pattern follows the 1875 town plan, although nearly all of the original 25' x 115' lots have been consolidated into larger lots. Most of the lots are about 50' x 75' wide, with mid-block alleys forming the rear lot lines. The blocks typically contain one or two vacant lots; some have been developed with infill housing. East Arbuckle also has a church, a county road department yard, water district offices and about a half dozen semi-rural residences. Some of the rural residences are on parcels which could potentially support additional dwellings.

The edges of east Arbuckle are characterized by abrupt transitions from residential to agricultural uses. The east-west streets terminate at large tracts of row crops that run the length of the community. These row crop fields also extend to the north, while the land to the northwest and northeast is planted in orchards. The sharp distinction between farm and non-farm uses helps to visually define the boundaries of the town, especially along its eastern edge. Because large acreage farms surround it East Arbuckle has remained a relatively compact community.

West Arbuckle: Like East Arbuckle, the west side is predominately residential. It has the most recently built housing stock with about 700 houses and 50 apartment units. This area generally has a greater variety of housing development than the east side. Only a small portion of the west side lies within the original townsite. Most of the development is contained in subdivisions developed after the completion of I-5 and more recently in newer modern designed subdivisions that are often surrounded by older subdivisions, well established orchards and crop land creating a less defined urban pattern with a spattering of agricultural uses transitioning into housing development. The west side also contains the Arbuckle Elementary School, the Pierce high School/L.G. Johnson Junior High School campuses, a 6-acre community park, a PG&E substation, the public library and three churches.

COLLEGE CITY

College City is primarily a residential community supported by the surrounding agricultural industry. Due to the community's infrastructure limitations (wells and septic tanks) College City has a less defined, spread out urban pattern with little growth potential.

HISTORY

When pioneer sheep farmer Andrew Pierce died in 1871, all of his land and possessions were left to the Christian Church. The proceeds from his estate sale were used to establish Pierce Christian College on a 9-acre plot. By the time classes began in 1874, the community of College City had been established around the campus. The town was described as a "moral and intelligent community" containing prosperous stores and fine homes. Enrollment dropped through the 1880s, and in 1894 the college was closed. The property was sold to the County and was used as a high school from 1897 until 1936. Enrollment had reached 162 students by the time the school was replaced by Pierce High School in Arbuckle.

The loss of the high school was a turning point for College City. Following the Depression, many of its stores and public buildings—including the school itself—were torn down. Few reminders of the town's heritage are left. Much of the original townsite has been planted in orchards.

LAND USE

College City was initially platted around a grid street pattern about 7 blocks wide by 8 blocks long. Most blocks contained a mid-block alley with either 4 or 8 lots on either side of the alley. Nearly all of the lots have since been consolidated into parcels from one-third acre to one acre in size and only about a third of these parcels are developed today. Homes are intermixed with orchards and are not concentrated in any particular part of the original townsite. The scattered, very low density development pattern and lack of a central commercial district gives the community a very rural feel. With no trace of the old college, library, or church, there is no focal point or "town center" in College City.

The community's development pattern consists of about 88 residences spread over the 31 acre townsite. All houses are served by private wells and septic tanks. Some of the residential properties contain farm buildings, small plots for field crops, livestock pens and orchards. Soils in College City are among the richest in the County and much of the townsite is intensively used for crop and nut production.

There are very few non-residential uses in College City. The general store and market on College City Road (Main Street) are the only retail-service uses in town. The town cemetery and harvester warehouse are located just north of the community.

GRIMES

The Community of Grimes is a small 68-acre agriculture and river recreation based residential community of about 430 residents, located at the mideast side of the County on the west side of the Sacramento River. It is primarily a residential community supported by the surrounding agricultural activities with some recreational activities associated with the adjoining Sacramento River.

HISTORY

At the time it was first settled, Grimes was located on an island bounded by the Sycamore Slough and the Sacramento River. The town was settled by Cleaton Grimes, who built a cabin on the present

townsite in 1851. Grimes became the center of the County's first major farming area during the early 1850s. The community grew because its river landing was an important port for landing river steamboats and barges. Railroad service was later established to the community, serving the town's large grain drying and storage facility. By the turn of the century, Grimes had become a small village with stores, a public hall, and a grain warehouse. One mile down-river at Eddy's Landing, ferries carried passengers across the Sacramento River to the Old Marysville Road.

LAND USE

Grimes extends five blocks from east to west and three blocks from north to south. The original townsite included several additional blocks on the east that were never built. As in Colusa, streets were laid out at right angles to the riverfront. Tall shade trees, some more than a century old, make the town visible from miles away across flat open surroundings. A large rice dryer and storage facility also provides a visual landmark that distinguishes the town from the large farms surrounding it.

The Grimes commercial district fronts on Main Street for about three blocks and with residential areas extend for about 10 square blocks on either side of Main Street. The original town plat contained about 200 lots, most 50' x 170' with mid-block alleys forming the rear lot lines. As with College City, nearly all the lots have been consolidated into parcels of two lots or more. However, unlike College City, most of the parcels in Grimes are developed and there are few vacant gaps or orchards between homes. Consequently, Grimes is a distinct and relatively compact community. Its shade trees, established and well maintained housing stock, and large lots (averaging one-half acre) create a pleasant semi-rural atmosphere.

The town has about 132 residences, with about two-thirds of them located south of Main Street. North of Main Street, a mobile home park includes about 20 additional units. Several large-lot rural residences are located in orchards along the south side of Leven Street.

Grimes' commercial district has gradually shifted west along Main Street as the town's ties to the river have diminished. The commercial area has been in a period of decline for many years due to the inability of its small establishments to compete with the region's larger retail and service centers. Many of the buildings surrounding the corner of 2nd and Main are vacant, including the historic Bank of America, the Oddfellows Hall, and the old town drug store. Other commercial buildings, such as the lumber store at the river, have been converted to private homes. Land uses along Main Street include a service station, a small market, a church, some small retail shops, and the volunteer fire department.

Two special uses in the community are the rice dryer and storage facility and the Grand Island Elementary School. The rice facility occupies about 8 acres just east of town along the abandoned railroad bed. The school, which dates to the 1930s, is viewed as an important part of the town's heritage and culture. Children from as far away as Arbuckle attend the school because it offers a "small town" educational experience not matched in the County's larger communities.

MAXWELL

The fourth largest community in Colusa County with a population of 1,015 persons, the town of Maxwell, is located along the I-5 corridor. The 162-acre agriculture and residential community has a well-defined downtown. It is the economic and social center of the north Colusa County region.

1. LAND USE AND DEMOGRAPHICS

HISTORY

Maxwell was the last of the Central Pacific-Southern Pacific Railway towns to be settled in Colusa County. W.S. McCoy, landowner and constable of the area, decided to emulate Tacitus Arbuckle by developing a townsite adjacent to the route of the proposed Northern Railway. The town plat, which was drawn freehand, was recorded at the courthouse in Colusa in 1877. During the same year, a general store, hotel, post office, saloon, blacksmith and wagon shop, and several residences were built. The town was originally called Occident, but was renamed in honor of George Maxwell (the town's postmaster) after he donated his land to the railroad for construction of its depot.

As the tracks were laid in 1878, a construction boom ensued in the new town. Most of the townsite was sold to the railroad's development subsidiary, the Western Development Company, for one dollar a lot. Grain warehouses and livery stables were built as new settlers arrived and stage coach connections were established between Maxwell and Colusa. By 1891, the community had grown to about 400 people. Dry land barley and wheat were grown on the surrounding farms while cattle and sheep grazed the foothills to the west.

Some of the historic buildings in Maxwell's commercial district still remain today, including the Masonic Temple (1885), the Opera House (1912), Brown's Garage (1910), and the Odd Fellows Hall (1914). Many of these buildings were popular social gathering or entertainment places during the town's early years but are mostly vacant or underutilized today.

LAND USE

Maxwell's development has historically been oriented around the north-south axis along the railroad and an east-west axis perpendicular to the railroad along Oak Street. The town has approximately 395 housing units. The original townsite was supplemented during the town's early years by a series of subdivisions or "additions" named after the landowners, including McCoy, Felt, Danley, Harden, and Mathieson. The additions generally extended the town's grid of streets to the configuration it bears today, roughly eight blocks by eight blocks. Land surrounding the town is used for field crops, such as rice.

FOCUS AREAS

Business District: The Town's business district extends along both sides of Oak Street for about three blocks. Commercial uses are centered along the blocks just west of the old rail depot. As in other small towns in Colusa County, downtown has been in an economic decline. In response, many of the newer shops in Maxwell focus on the sale of specialty items such as flowers, antiques and gifts. Oak Street also includes a restaurant, market, auto parts shop, beauty salon, barber shop, laundromat, and the town library. Several of the storefronts are vacant. Just west of the retail district, Oak Street includes the post office, fire department and American Legion Hall.

Old 99 and Railroad Area: Agricultural-related industrial uses extend along both sides of the railroad, as they have for more than a century. Most of the wood sheds and buildings that lined the tracks have been demolished or lost to fire. A large grain warehouse, surrounded by rice harvesters, occupies the northeast corner of Oak and the railroad. Other metal or masonry warehouses are located south of Oak Street along the west side of the tracks and Old Highway 99. There are a number of large vacant lots along the railroad and Highway 99 used for truck and harvester parking. These lots are intermixed with scattered commercial uses, including two service stations, two restaurants, a bank, and a convenience store.

Residential Areas: Maxwell contains about 320 houses, 20 apartment units and a mobile home park. One-half of the town's housing lies in the northwest quadrant (north of Oak Street and west of the railroad). In total, about 120 acres in the town are used for housing and the adjoining streets. Most residential lots in the original townsite were 25' x 116', while the "additions" featured slightly larger lots. Virtually all of the housing in the Maxwell townsite was built on parcels consisting of two or more of the original lots. Residential parcels as large as ½ acre are not uncommon within the town, although most homes are on lots of between 6,000 and 15,000 square feet.

The residential areas are fairly compact. Although most blocks contain one or two vacant lots, the lots are often used for backyard gardening and in some cases for raising livestock. Some of the residential blocks include non-residential uses, especially barns, large metal sheds, and small home businesses. The residential area also includes the elementary school on the north edge of town, the high school on the west edge of town, and three churches.

Nearly all recent residential growth in Maxwell has been on the northwest and southern edges of town. This is likely to be the case in the near future as well, since these areas contain most of the available vacant lots in the public utility district. Development on the north has been on ½ and 1/3 acre lots and has consisted of higher-priced housing. Development in the southeast has been concentrated in the 28-lot subdivision along Cedar Street and Central Avenue and in a series of lots along Cosner Avenue.

PRINCETON

The Community of Princeton is a 105-acre agriculture and river recreation based residential community of about 398 residents, located at the northeast side of the County next to the Sacramento River. It is primarily a residential community supported by the surrounding agricultural activities with some recreation opportunities from the adjoining river.

HISTORY

Princeton was laid out in the early 1850s on the site of the Sixteen Mile House, a roadside inn which served wagon traffic on the road to the Northern Mines. Princeton became a major steamboat landing on the Sacramento River during the late 1860s and was later served by the Southern Pacific Railroad. The community was also the site of a ferry crossing to Marysville Road. The ferry was California's first electrically powered river ferry in 1932.

LAND USE

Princeton's development pattern reflects the man-made features which form its eastern and western boundaries. Levees—containing the Sacramento River on the east and the River Branch Canal on the west—have defined the edges of town for many years. Because these two levees are parallel to each other and are less than one-quarter mile apart, Princeton's growth has been pushed to the north and south. The town is oriented along Highway 45, the principal route between Colusa and Chico. The railroad passed about one-half mile west of town so it has had little influence on Princeton's appearance today.

The town extends four blocks from north to south and three blocks from the east to west. Most of the blocks are bisected by a north-south alley. Lots in the original townsite were somewhat larger than in other Colusa County towns, averaging 1/3 of an acre. Most of the town's 155 homes are single family units on parcels of ¼ to ½ acre. The remaining homes are some duplexes, multi-family units including a 4-unit apartment building, and a small mobile home park. Most of the housing is contained within the

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original townsite, although a strip of lots along Highway 45 extends north of town to the old Princeton Ferry Landing.

Princeton has a well-defined “downtown” occupying a single block along Highway 45 between Prince and Center Streets. Most of the previous commercial businesses in town have left, so there are a number of vacant buildings. An active restaurant and market/deli remain on Commercial Street. The library, irrigation district, and post office are located in this area, as well. There are also several grain storage buildings. The composition of uses is very similar to that found in downtown Grimes. However, Highway 45 has moderate traffic volumes, creating a less intimate atmosphere in the central area than in Grimes. North and south of downtown, homes extend along the highway to the edges of town.

The Princeton High School and Elementary School occupy about one-quarter of the town’s developed acreage. Both buildings are focal points of the community and help establish Princeton as the service center for the surrounding farm areas of Colusa and Glen Counties. The town also contains two churches, a fire station and a lodge building. A few of the residential area lots are developed with metal sheds and warehouses, but these uses generally have not created conflicts with surrounding uses.

Joining Princeton with the farmland to the west are bridges at Norman Road, Center Street, and Spencer Road that cross the River Branch Canal. Most land west of the canal is used for rice farming, although about 12 acres are used by the high school for playing fields. There are also clusters of homes along Center Street and along Norman Road, and there are sewage treatment ponds just north of Spencer Road. East of the Sacramento River levee, the land is highly flood prone

STONYFORD

The town of Stonyford, located in the foothills of the Indian Valley with an approximate elevation of 1,180 feet above sea level, has an estimated population of 200 people and is the largest population center in the northwestern section of Colusa County. The town serves as the social/economic hub of a larger area of about 600 residents.

HISTORY

Stonyford was established in 1890 as a mining and ranch town and was originally laid out on a 100-acre site along a grid of streets, six blocks wide by three blocks long. It encompassed a variety of narrow and deep commercial lots. Only a fraction of the town site was ever developed. Over the years, entire blocks of the town were consolidated into single home sites ranging from 10,000 square feet to as large as eight acres.

Stonyford Community Area Plan: The Stonyford-Lodoga area was the subject of a special area plan completed in 1983. The plan helped establish the policy framework for the 1989 General Plan for this area and set development performance standards. Major goals of the plan were:

- Preserve and maintain the rural character of the area.
- Maintain a high environmental quality.
- Maintain and protect viable agricultural land.
- Encourage orderly population growth.
- Provide safe all-weather roads.

- Insure the adequate provision of water, sewage disposal and public services

LAND USE

Today, Stonyford is a community composed of about 80 homes and a number of businesses and community facilities. Market Street, the main commercial corridor, has a general store, one restaurant and bar, a phone company exchange building, a real estate office with a soda fountain, a post office, a Grange (meeting hall) and the historic town hall (built in 1899). The De Angelis Government Center, located near the center of town, provides a number of services to the community, including a Sheriff's substation, a part time medical clinic, a volunteer citizen service center and a branch of the Colusa County Library. The town also has two historic churches: a Catholic and a Community church. The town hall/lodges and churches have been social gathering places for nearly a century and are a very important part of community life in Stonyford.

The Stonyford Rodeo Grounds, east of the town, serves as Stonyford's largest annual event. Rodeo Weekend, sponsored by the Horseman's Association, occurs during the first weekend in May, and is nationally known as the second rodeo on the national circuit in Northern California. The Stonyford Buyers Group, dinner and auction, generally held in September, is a community-oriented event that supports children who raise farm animals under the Future Farmers of America Organization. Attracting many visitors to the town for fishing the East Park Reservoir, to the southeast of Stonyford, is an active recreation area of about 4,000 acres, managed by the Federal Bureau of Reclamation.

There are a few rural residential subdivisions in the south part of Stonyford, all contained within the town's water district. These subdivisions consist of about 25 homes generally situated on one to five acre lots. About a ½ mile south of town is the Mendocino National Forest Ranger Station which provides housing for rangers working in the southeastern portion of the forest.

For the most part, the Stonyford-Lodoga Area has been maintained with respect to these Area Plan goals. Within the town of Stonyford, the Area Plan and 1989 General Plan show rural residential development on the remaining vacant parcels in the water district. Because the town lacks a central sewer system, subdivision of vacant parcels into new lots smaller than one acre is discouraged. However, since the town was laid out many years ago, development on existing lots smaller than one acre is permitted. New commercial development, as seen by the 1989 General Plan, restricts commercial development on the vacant parcels within the existing town center along Market Street. To encourage in-fill commercial development in town, strip commercial development along the road between Stonyford and Lodoga has been discouraged. The intention here is to respect the original town site subdivision design while maintaining the town's rural character.

The land immediately adjoining Stonyford is designated as "upland transition" area. This use provides a buffer between the town and the surrounding ranchlands and undeveloped foothills. Within the transition area, farming and ranching are predominant uses, though some very low density residential uses have been allowed. Over 5,000 acres of land in this area are under Williamson Act contract (agricultural preserves). Consistent with the 1983 Stonyford-Lodoga Area Plan and to comply with County water availability and slope density standards, these low density residential uses have been limited on parcels of at least 10 acres.

Outside of the existing Stonyford-Lodoga area, 10-acre minimum lot size subdivisions are allowed along most of the Stonyford-Lodoga Road and on the east side of East Park Reservoir. Elsewhere, minimum allowable lot sizes are 10 acres, encouraging continued agriculture, ranching, and open space uses. In

1. LAND USE AND DEMOGRAPHICS

those areas, where rural residential development is allowed, proposed parcels must meet certain slope and groundwater standards.

ASSOCIATED COMMUNITIES

The community of Lodoga, located about seven miles east of town, has a restaurant and store surrounded by about 30 homes and extends for about ½ mile along the banks of Indian Creek. Most of these homes were originally built as vacation cabins. Homes generally occupy the ¼ to ½ acre lots that are wedged in the strip of land between the creek and the Lodoga/Leesville-Lodoga Road.

A third population center, located between Stonyford and Lodoga, is the community of Century Ranch containing about 30 homes. This 1,000 lot community was originally subdivided in 1965, and was envisioned to be a planned development complete with a golf course, airstrip and community center. However, there was not adequate water supply to serve the community and a moratorium was placed on new connections to the water system, so developed has slowed significantly. Due to the moratorium, any new homes must have adequate land area to support a well and on-site septic system.

1.3 AGRICULTURAL AND TIMBER RESOURCES

REGULATORY FRAMEWORK

Federal

FARMLAND PROTECTION POLICY ACT

The Natural Resources Conservation Service (NRCS), an agency within the U.S. Department of Agriculture, is responsible for implementation of the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize federal programs' contribution to the conversion of farmland to nonagricultural uses by ensuring that federal programs are administered in a manner that is compatible to state, local, and private programs designed to protect farmland. The NRCS provides technical assistance to federal agencies, state and local governments, tribes, or nonprofit organizations that desire to develop farmland protection programs and policies. The NRCS summarizes FPPA implementation in an annual report to Congress.

FARM AND RANCH LANDS PROTECTION PROGRAM

The NRCS administers the Farm and Ranch Lands Protection Program (FRPP), a voluntary program aimed at keeping productive farmland in agricultural uses. Under the FRPP, the NRCS provides matching funds to state, local, or tribal government entities and nonprofit organizations with existing farmland protection programs to purchase conservation easements. According to the 1996 Farm Bill, the goal of the program is to protect between 170,000 and 340,000 acres of farmland per year. Participating landowners agree not to convert the land to nonagricultural use and retain all rights to use the property for agriculture. A conservation plan must be developed for all lands enrolled based upon the standards contained in the NRCS Field Office Technical Guide. A minimum of 30 years is required for conservation easements and priority is given to applications with perpetual easements. The NRCS provides up to 50 percent of the fair market value of the easement being conserved (NRCS, 2004). To qualify for a conservation easement, farm or ranch land must meet several criteria. The land must be:

- Prime, Unique, or other productive soil, as defined by NRCS based on factors such as water moisture regimes, available water capacity, developed irrigation water supply, soil temperature

range, acid-alkali balance, water table, soil sodium content, potential for flooding, erodibility, permeability rate, rock fragment content, and soil rooting depth;

- Included in a pending offer to be managed by a nonprofit organization, state, tribal, or local farmland protection program;
- Privately owned;
- Placed under a conservation plan;
- Large enough to sustain agricultural production;
- Accessible to markets for the crop that the land produces; and
- Surrounded by parcels of land that can support long-term agricultural production.

State

CALIFORNIA DEPARTMENT OF CONSERVATION

The Department of Conservation (DOC) administers and supports a number of programs, including the Williamson Act, the California Farmland Conservancy Program (CFCP), the Williamson Act Easement Exchange Program (WAEEP), and the Farmland Mapping and Monitoring Program (FMMP). These programs are designed to preserve agricultural land and provide data on conversion of agricultural land to urban use. The DOC has authority for the approval of agreements entered into under the WAEEP. Key DOC tools available for land conservation planning are conservation grants, tax incentives to keep land in agriculture or open space, and farmland mapping and monitoring.

WILLIAMSON ACT

The California Land Conservation Act, also known as the Williamson Act, was adopted in 1965 to encourage the preservation of the state's agricultural lands and to prevent their premature conversion to urban uses. In order to preserve these uses, the act established an agricultural preserve contract procedure by which any county or city within the state taxes landowners at a lower rate, using a scale based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. In return, the owners guarantee that these properties remain under agricultural production for a 10-year period. The contract is self-renewing; however, the landowner may notify the County at any time of the intent to withdraw the land from its preserve status. There are two means by which the landowner may withdraw the land from its contract preserve status. First, the landowner may seek to cancel the contract. This takes the land out of the contract quickly with a minimal waiting period but the landowner pays a statutory penalty to the State. Second, the landowner may notice a non-renewal or seek a partial non-renewal of the contract. Land withdrawal through the non-renewal process involves a 9 or 10-year period (depending on the timing of the notice) of tax adjustment to full market value before protected open space can be converted to urban uses. Consequently, land under a Williamson Act contract can be in either a renewal status or a non-renewal status. Lands with a non-renewal status indicate the owner has withdrawn from the Williamson Act contract and is waiting for a period of tax adjustment for the land to reach its full market value. Non-renewal lands are candidates for uses that were previously considered incompatible within the next 10 years or less, depending on when the notice of non-renewal was filed. Figure 1-6 identifies Williamson Act lands in Colusa County.

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Williamson Act subvention payments to local government have been suspended for fiscal year 2009-10 due to the state's fiscal constraints. While subvention payments have been customary for many years, these payments have never been guaranteed. The Williamson Act contracts between landowners and local governments are important to the state's agricultural production and remain in force, regardless of the availability of subvention payments.

FOREST PRACTICES RULES

The California Department of Forestry and Fire Protection (CalFire) implement the laws that regulate timber harvesting on privately-owned lands. These laws are contained in the Z'berg- Nejedly Forest Practice Act of 1973 which established a set of rules known as the Forest Practice Rules (FPRs) to be applied to forest management related activities (i.e., timber harvests, timberland conversions, fire hazard removal, etc.). They are intended to ensure that timber harvesting is conducted in a manner that will preserve and protect fish, wildlife, forests, and streams. Under the Forest Practices Act, a Timber Harvesting Plan (THP) is submitted to CalFire by the landowner outlining what timber is proposed to be harvested, harvesting method, and the steps that will be taken to prevent damage to the environment. If the landowner intends to convert timberland to non-timberland uses, such as a winery or vineyard, a Timberland Conversion Permit (TCP) is required in addition to the THP. It is CalFire's intent that a THP will not be approved which fails to adopt feasible mitigation measures or alternatives from the range of measures set out or provided for in the Forest Practice Rules, which would substantially lessen or avoid significant adverse environmental impacts resulting from timber harvest activities. THPs are required to be prepared by Registered Professional Foresters (RPFs) who are licensed to prepare these plans (CalFire, 2007). For projects involving TCPs, CalFire acts as lead agency under CEQA, and the County acts as a responsible agency.

Local

RIGHT TO FARM ORDINANCE

Chapter 34 of the County Code contains what is commonly called a "Right-to- Farm" ordinance. The ordinance is intended to preserve and protect lands zoned for agricultural use, to support and encourage continued agricultural operations in the County, and to forewarn prospective purchasers and users of property near or adjacent to agricultural operations of the sounds, odors, dust and chemicals that may accompany agricultural operations. It further intends to limit, by means of communication, nuisance litigation regarding agriculture or affecting agriculture.

The ordinance requires sellers of property in Colusa County to disclose that the property is located in a rural-agricultural county and that the property may be subject to inconvenience or discomforts associated with agricultural practices. The disclosure must also state that the County sets agricultural as a priority use of lands and that users of such property should be prepared to accept such inconvenience or discomfort as normal and necessary to farm operations. Building permits include a similar disclosure statement. Chapter 34 created the Colusa County Good Neighbor Committee to mediate disputes between agricultural and nonagricultural interests regarding land use to avoid or reduce the filing of nuisance suits.

HISTORY

Although the prospect of gold brought most people to California, and particularly to the Sierra Nevada, during the late 1800s many were disappointed. With the discovery of fertile soils in the Great Central Valley, many of these early arrivals remained in the area to farm. Some of the most desirable agricultural sites in the Valley were located in the eastern portion of Colusa County. Originally, Colusa

County farmers grew grains, particularly wheat, and relied on the annual rains and favorable weather to produce some of the greatest grain yields during the early nineteenth century. Established in 1887, the Glenn-Colusa Irrigation District diverted Sacramento River waters to the agriculture fields of Colusa County. With the combination of prime soils and inexpensive water availability, agriculture was transformed in the County from limited dry farming to a more diverse irrigated farming. Agriculture became the County's major industry and continues today as Colusa County's primary economic base.

AGRICULTURAL LAND USE

In 2009, the Colusa County Assessor classifies 571,195 acres, 79%, of the unincorporated County's land area as agricultural (see Table 1.1-4). The Colusa County Agricultural Commission identifies 434,400 acres as cropland and 206,600 acres as underdeveloped rangeland. Within these agricultural classifications, farmland is used for a variety of crop, livestock, and other agriculturally-related activities.

Important Farmlands

The California Department of Conservation, as part of its Farmland Mapping and Monitoring Program, prepares Important Farmland Maps indicating the potential value of land for agricultural production. The Important Farmland Maps identify five agriculture-related categories and three non-agricultural categories:

Prime Farmland: Prime farmland is land with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance: Farmland of statewide importance is farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland: Unique farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance: Farmland of local importance is considered land important to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. Farmland of local importance in Colusa County includes lands which do not qualify as Prime, Statewide, or Unique farmland, but are currently irrigated crops or pasture or non-irrigated crops; lands that would meet the Prime or Statewide designation and have been improved for irrigation, but are now idle; and lands that currently support confined livestock, poultry operations and aquaculture.

Grazing Land: Grazing land is land on which the existing vegetation is suitable for the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for this category is 40 acres.

Urban and Built-up Land: This category consists of land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other

1. LAND USE AND DEMOGRAPHICS

transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land: Other land is land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Water Area: This category consists of bodies of water.

In 1998, the FMMP began classifying Colusa County farmlands according to the above descriptors. The most recent farmland survey was conducted in 2006. Figure 1-7 depicts farmlands by classification in Colusa County. Table 1.3-1 summarizes the farmland and other classifications for Colusa County by the FMMP from 1998 to 2006. Since the initial survey in 1998, important farmlands in the county have decreased by 1,264 acres and grazing land has increased by 168 acres, for a net decrease in agricultural lands of 1,096 acres. The decrease in important farmlands was primarily in farmland of local importance, which decreased by 881 acres. Prime farmland and unique farmland decreased by 216 and 221 acres, respectively, while farmland of statewide importance increased by 53 acres.

Harvested Acreage

Chart 1-4 illustrates harvested acreage in Colusa County from 1995 to 2008. During this time period, the most acreage harvested was 501,941 acres in 1997 and the least acreage harvested was 443,645 in 2001. The annual average of harvested acreage is 471,418. While there have been fluctuations in harvested acreage, the amount has stayed consistently above 440,000 acres during the previous two decades.

FARMLAND CONVERSION

While farmland has been converted for urban land uses, such as residential and commercial developments, FMMP field reports have also identified significant amounts of farmland converted to resource conservation uses. Residential developments in the vicinity of Colusa, Williams, and Arbuckle and expansion of the Colusa Industrial Park south of Colusa resulted in the conversion of farmlands to urban and built up land uses. The construction of parking lots, ball fields, and other community-serving improvements in Arbuckle and Princeton have also converted small amounts of farmland to urban and built up land uses. Farmlands that lay fallow for three or more FMMP cycles were converted to grazing lands. Conversely, development of irrigated orchards in several areas resulted in the conversion of grazing lands to irrigated farmlands. Irrigated farmland going to wetlands accounted for the conversion of 2,755 acres of farmland to other lands from 2002 to 2006.

FARMLAND PRESERVATION

Approximately 317,796 acres, or about 55.6 percent of the County's assessed agricultural land, is under some form of Williamson Act contract with Colusa County. The Williamson Act is described in greater detail under the Regulatory Framework section of this chapter. Of this amount under contract, 144,487 acres or about 43 percent is designated Prime Agriculture land. Prime agricultural land is considered the most valuable and productive farmland available. It must meet certain soil conditions defined by the United States Department of Agriculture and mapped by the State of California. Figures 1-6 and 1-7 provide a distribution of Williamson Act Contract lands and the locations of prime agricultural lands in

1. LAND USE AND DEMOGRAPHICS

Table 1.3-1: FMMP Farmland Classification and Land Use Categories

Farmland Classification and Land Use Categories	Acreage by Category (1)					1998-2006 Net Acreage Change	Annual Average Change
	1998	2000	2002 (3)	2004	2006 (4)		
Prime Farmland	201,910	202,231	201,346	201,642	200,182	-1,728	-216
Farmland of Statewide Importance	1,746	1,810	1,826	2,153	2,170	424	53
Unique Farmland	125,083	125,496	126,916	124,796	123,318	-1,765	-221
Farmland of Local Importance	239,966	236,353	234,186	232,759	232,921	-7,045	-881
Important Farmland Subtotal	568,705	565,890	564,274	561,350	558,591	-10,114	-1,264
Grazing Land	7,684	7,526	9,408	9,151	9,030	1,346	168
Agricultural Land Subtotal	576,389	573,416	573,682	570,501	567,621	-8,768	-1,096
Urban and Built-Up Land	4,293	4,259	4,431	4,624	4,877	584	73
Other Land	157,872	160,878	160,439	163,429	165,983	8,111	1,014
Water Area	1,838	1,838	1,838	1,838	1,911	73	9
Total Area Inventoried (2)	740,392	740,391	740,390	740,392	740,392	0	0

(1) FIGURES ARE GENERATED FROM THE MOST CURRENT VERSION OF THE GIS DATA. FILES DATING FROM 1986 THROUGH 1992 WERE REPROCESSED WITH A STANDARDIZED COUNTY LINE IN THE ALBERS EQUAL AREA PROJECTION, AND OTHER BOUNDARY IMPROVEMENTS.

(2) TOTAL AREA INVENTORIED INCREASED IN 1998 DURING UPGRADE TO IMPORTANT FARMLAND STATUS TO INCLUDE SMALL AREA IN THE NORTHWESTERN CORNER OF COLUSA COUNTY WHICH HAD NOT PREVIOUSLY BEEN MAPPED.

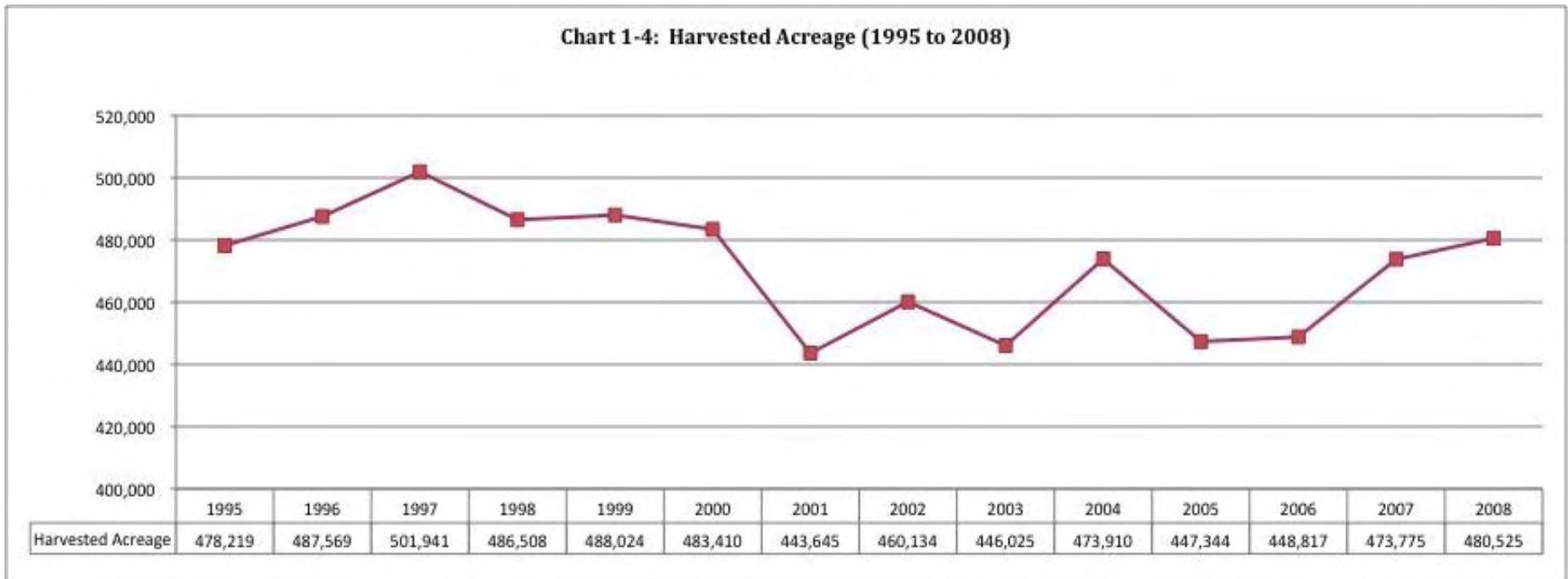
(3) DUE TO THE INCORPORATION OF AN UPDATED DIGITAL SOIL SURVEY DATA DURING THIS UPDATE, ACREAGES FOR FARMLAND, GRAZING AND OTHER LAND USE CATEGORIES MAY DIFFER FROM THOSE PUBLISHED IN THE 2000-2002 CALIFORNIA FARMLAND CONVERSION REPORT.

(4) WATER AREA INCREASED IN 2006 DUE TO IMPROVED DELINEATION OF FUNKS RESERVOIR, WHICH HAD INITIALLY BEEN MAPPED BEFORE IT WAS FULL.

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, 2010

1. LAND USE AND DEMOGRAPHICS

Chart 1-4: Harvested Acreage (1995 to 2008)



the County. This prime agricultural land is located primarily in the eastern portions of the County within the Sacramento River Hydrologic Region. One parcel of 22.8 acres is located in the City of Williams; the remaining parcels are in the unincorporated area of Colusa County. Of the parcels under Williamson Act contract, 41 parcels representing 4,157 acres are set to expire by 2030.

Farm Characteristics

The U.S. Census of Agriculture is a nationwide survey that is conducted every five years and provides agricultural data at the county-level. The census provides a comprehensive summary of agricultural activity that includes the number of farms by size and type, inventory and values for crops and livestock, operator characteristics and much more. Table 1.3-2 summarizes primary characteristics of farms in Colusa County.

The number of farms in Colusa County decreased by 22, or 3 percent, from 1992 to 2007. During this same time period, the amount of land in farms increased by 23,856 acres, or 5 percent. The U.S. Census of Agriculture began to identify the median farm size in 1997. Median farm sizes in Colusa County fluctuated from 211 acres in 1997, up to 280 acres in 2002, then decreased to 190 acres in 2007. While the majority of farm operators farm as their principal occupation, the ratio has decreased from 68 percent (569 farmers as principal occupation) in 1992 to 57 percent (464 farmers as principal occupation) in 2007.

TABLE 1.3-2: FARM CHARACTERISTICS						
	1992	1997	2002	2007	Change 2007 - 1992	
					Number	Percent
Farms	836	810	821	814	-22	-3%
Land in Farms	450,236	430,958	485,392	474,092	23,856	5%
Median Size of Farm (Acres)	--	211	280	190	-21	-10%
Operators by Principal Occupation						
Farming	569	526	589	464	-105	-18%
Other	267	284	232	350	83	31%

SOURCE: US DEPARTMENT OF AGRICULTURE, 1992, 1997, 2002, AND 2007

As shown in Table 1.3-2, the number of farms and median farm size has fluctuated in recent years. Table 1.3-3 takes a more detailed look at the number and size of farms in Colusa County, both historically and currently. Reflecting both the increase in farmed acreage and production over the last 30 years, the number of farms in Colusa County increased by about 26 percent from 645 to 814 (see Table 1.3-3 below). The majority of farm sizes in the County are between 10 and 499 acres. A decrease of about 11 percent in the largest farm size category of over 1,000 acres has recently occurred.

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TABLE 1.3-3: RANGE OF FARM SIZES IN COLUSA COUNTY 1978-2008

Size Range (acres)	1978		2007		Change	
	Number	Percent	Number	Percent	Number	Percent
Less than 10	39	6%	64	8%	25	64%
10-49	135	21%	190	23%	55	41%
50-179	138	21%	137	17%	-1	-7%
180-499	147	23%	204	25%	57	39%
500-999	69	11%	115	14%	46	67%
1,000-1,999	117	18%	104	13%	-13	-11%
Total	645	100%	814	100%	169	26%

SOURCE: U.S. CENSUS OF AGRICULTURE, 1978 AND 2007

While there were over 800 farms in Colusa County in 2007, 205 farms (25 percent) appear to not farm as a primary or significant source of income, with \$10,000 or less in agricultural sales. Another 17 percent of farms had sales in the range of \$10,000 to \$49,999. More than one out of five farms in Colusa County had \$500,000 or more in sales, while 14 percent of farms experienced sales from \$250,000 to \$499,999 and 16 percent had sales in the \$100,000 to \$249,000 range, as shown in Table 1.3-4.

TABLE 1.3-4: FARMS BY VOLUME OF SALES (2007)

Volume of Sales	Number	Percent
Under \$1,000	124	15%
\$1,000 - \$4,999	60	7%
\$5,000 - \$9,999	21	3%
\$10,000 - \$19,999	46	6%
\$20,000 - \$39,999	60	7%
\$40,000 - \$49,999	30	4%
\$50,000 - \$99,999	57	7%
\$100,000 - \$249,999	131	16%
\$250,000 - \$499,999	111	14%
\$500,000 or more	174	21%

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, 2009

FARMING AND THE ECONOMY

Based on the U.S. Census of Agriculture, the average value of farmland in Colusa County in 2007 was \$3,979 per acre. The County experienced an increase in agricultural land growth of over 9 percent between 1990 and 2008 from 396,000 acres to 434,400 acres. Recognizing the value of agriculture in the County, the State of California Williamson Act and Super Williamson Act Agricultural Preservation programs were implemented by the County. This program offers reduced property taxes and subvention payments to property owners who maintain their properties in agricultural production.

Crop and Livestock Valuation

In 2008, the County's total crop production value was estimated to be over \$662 million, a 69% increase over 2007's value of about \$484 million. Rice crops alone were responsible for an increase of \$149 million from 2007 to 2008; this increase is mainly attributed to the change in the value of rice from \$305

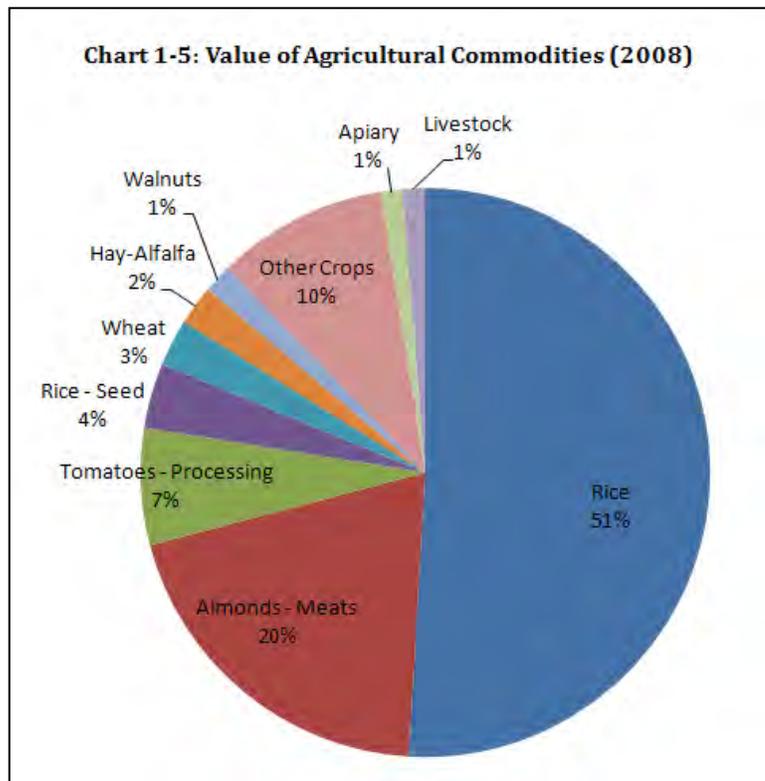
to \$535 per ton rather than being attributed to a significant increase in production, an increase in the value of rice, rather than a significant increase in production. While there have been some year to year fluctuations, most notably a decrease of \$68 million from 2000 to 2001, overall agricultural valuation has been increasing over the past two decades, as shown in Table 1.3-5.

TABLE 1.3-5: HISTORIC CROP AND LIVESTOCK VALUATION		
Year	Valuation	Growth Rate
1990	\$207,430,100	
1995	\$304,900,000	47%
2000	\$345,906,000	13%
2001	\$277,826,000	-20%
2002	\$290,264,000	4%
2003	\$361,573,000	25%
2004	\$351,604,000	-3%
2005	\$392,677,000	12%
2006	\$422,729,000	8%
2007	\$484,525,000	15%
2008	\$662,644,000	37%

SOURCE: COLUSA COUNTY DEPARTMENT OF AGRICULTURE, 2009

LEADING AGRICULTURAL COMMODITIES

This impressive crop valuation consists of a wide variety of agricultural commodities (see Table 1.3-6). Field crops are responsible for 59 percent of agriculture sold, followed fruit and nut crops at 24 percent. Looking at individual crops, rice dominates the acreage planted (31 percent) as well as total sales (51 percent), followed by almonds which account for 7 percent of acreage and 21 percent of sales (meat and hulls). The number of acres devoted to rice farming increased by almost 80 percent between 1990 and 2008 from 83,800 to 150,200 acres. The per acre unit production of rice also increased by over 150 percent during this same period making rice the most profitable crop in the County. Note that higher market prices for rice over the last year (2008) has significantly increased overall crop value. Rice has become more of a specialty crop for farmers as they evaluate environmental conditions of the farm, such as location and soil and world demand market conditions in determining which varieties of rice to grow. Table 1.3-6



1. LAND USE

below provides a distribution of the agricultural commodities with the largest acreages and values in Colusa County.

TABLE 1.3-6: DISTRIBUTION OF AGRICULTURAL COMMODITIES BY VALUE

Description	Total Unit	Acreage	%	Total Value	%
Agricultural Crops					
Vegetable Crops		14,075	3%	\$47,353,000	7%
Tomatoes - Processing	616,148 tons	13,940	3%	\$43,993,000	7%
Fruit and Nut Crops		45,140	9%	\$162,182,000	24%
Almonds - Meats	44,075 tons	35,260	7%	\$132,225,000	20%
Almonds – Hulls	55,080 tons		0%	\$4,957,000	1%
Walnuts	8,925 tons	5,100	1%	\$10,710,000	2%
Field Crops		399,500	83%	\$389,365,000	59%
Beans - Dry	3,951 tons	4,390	1%	\$3,991,000	1%
Corn - Grain	16,775 tons	2,750	1%	\$2,852,000	0%
Hay-Alfalfa	86,580 tons	11,100	2%	\$15,152,000	2%
Rice	630,840 tons	150,200	31%	\$337,499,000	51%
Wheat	76,720 tons	27,400	6%	\$17,646,000	3%
Seed Crops		12,720	3%	\$29,124,000	4%
Rice - Seed	36,036 tons	8,580	2%	\$24,504,000	4%
Sunflowers	1,175 tons	1,780	0%	\$2,632,000	0%
Non-Certified Seed Crops		9,090	2%	\$18,069,000	3%
Cucumbers	521,100 lb	1,930	0%	\$6,383,000	1%
Squash	360,450 lb	890	0%	\$2,667,000	0%
Watermelon	572,000 lb	2,200	0%	\$3,003,000	0%
Subtotal – All Crops	NA	480,525	100%	\$646,093,000	98%
Livestock and Other Commodities					
Apiary	10,000 lb honey /65,000 colonies	NA	NA	\$7,931,000	1%
Livestock	22,600 head	NA	NA	\$8,598,000	1%
Livestock Products	NA	NA	NA	\$22,000	0%
Subtotal				\$16,551,000	2%
TOTAL				\$662,644,000	100%

SOURCE: COLUSA COUNTY DEPARTMENT OF AGRICULTURE, 2008

In terms of area covered by other agricultural types, fruit and nut orchards occupy over 10 percent of the agricultural land in the County accounting for over 40,000 acres. Most of the almond crop is grown south and southwest of Arbuckle. Prunes and walnuts are grown along the Sacramento River and in limited areas around Williams, Arbuckle and limited portions in the western foothills of the County. With the additional water supply provided to the western side of the valley by the Tehama-Colusa Canal, acreage in the County devoted to these orchards has almost doubled since 1985. Although processed tomatoes continue to be a top valued crop, the County has actually experienced a reduction in acreage and value of this crop over the last twenty years. Wheat ranks third in acreage planted in the County and has increased in both area and value over this same period. It is grown on the higher elevation portions of the valley and in the dry upland valleys. Other important field crops include corn, dry beans, alfalfa and safflower. Vine and seed crops, particularly wine grapes continue to contribute to Colusa's economy.

Livestock and apiary commodities represent about 2 percent of the County's agricultural income. Although livestock plays an important role in the County's foothill and mountain area economies, utilizing undeveloped acreage where most of the livestock is raised, it has declined over the last twenty years in terms of its proportion to the County's gross agricultural production and value.

Relative to processing industries, Colusa County has become a world leader in rice production and processing technology and is home of one of the most efficient, computerized rice milling operation in the world. The County is also recognized as a leader in the advancement of technology to increasing yield and reducing costs in rice production. Indian Harvest Food Company in Colusa is the nation's leading marketer of wild rice. Relative to other agricultural commodity processing, Morningstar Packing Company, located in Williams, operates the world's largest tomato processing plant with the capacity to process over one million tons of tomatoes per season.

The four largest agriculture industry employers in the County are Van Brothers, TMP Farming, Morning Star Canning and Olam Foods. Table 1.3-7 below lists the largest agricultural employers in the County.

TABLE 1.3-7: LARGEST AGRICULTURAL COMPANIES – COLUSA COUNTY (2009)

Company	Business/Farm Type	Location
Archer Daniel Midland (ADM Rice)	Rice milling	Arbuckle
California Family Foods	Rice milling	Arbuckle
Charter Oaks	Almond farming and processing	Arbuckle
Chico Nut Company	Almond and other nut processing	Arbuckle
Strain Ranches	Rice, almonds, pistachios, wheat, rice farming, drying, warehousing and almond processing	Arbuckle
Sun Valley Rice	Rice milling	Arbuckle
T and P Farms	Wheat, rice, processed tomatoes, almonds, vegetables, general crop farming and processing.	Arbuckle
Indian Harvest Food Specialties	Wild rice milling	Colusa
River Bend Rice	Rice milling	Colusa
Western Milling Company	Rice drying and storage	Grimes
CC Dennis Canal Farms	Rice, almonds, and wheat farming.	Maxwell
American Commodity Company	Rice milling	Williams
Bar Ale Feed	Feed/grain milling	Williams
Cortina Hulling/Shelling	Processing of almonds.	Williams
De Pue Warehouse	Grain drying and storage	Williams
Morningstar Packing Company	Processing and canning tomatoes	Williams
Olam Foods	Processing and canning tomatoes	Williams
Seminis Vegetable Seeds	Processing of vegetable seeds	Williams
Vann Brothers	Sunflower seeds, rice, almonds, processing tomatoes, and wheat farming	Williams

SOURCE: COLUSA COUNTY DEPARTMENT OF AGRICULTURE, 2009

Agriculture and Energy Production

Other industries have been developed as spill over from the County's agriculture production. Colusa County's agricultural industry has taken advantage of alternative energy production opportunities, including on-site solar systems and biomass facilities.

Colusa Rice Company — The Colusa Rice facility dries and stores harvested rice. In 2007, it looked to solar power as a way to both help the environment and better manage energy costs. Their vision led to the construction of a 314 kW solar electric system that is anticipated to generate more than 402,000 kWh per year—enough to power 60 average homes. The solar array installation provides more electricity than the company needs, so excess electricity is exported to Pacific Gas and Electric (PG&E). The system is estimated to eliminate 143 tons of greenhouse gas emissions a year.

De Pue Warehouse - The De Pue rice drying warehouse in Maxwell installed a solar system on its five acre site. The 1 megawatt system went into production at the end of 2009. The system is estimated to cut CO2 emissions by 1,500 metric tons per year.

Wadham Biomass Facility - The Wadham biomass facility, located just northwest of Williams, has the capacity to convert approximately 200,000 tons of agricultural waste (rice hulls) into 26.5 megawatts of electricity per year; enough to power 22,000 homes per year. The facility's primary by-product, rice hull silica, is sold to the steel industry as an insulating material for molten ladles of steel, to the cement industry to mix with Portland cement, and to the agricultural industry as a soil amendment to help break up heavy clay soils.

Labor Resources

Labor is a key factor in the agricultural industry as certain farming practices are labor intensive, such as processed tomatoes and row crops. Although some farming, such as rice production, which is a highly mechanized process, does not involve labor intensive practices. This type of farming does, however, involve significant support labor, such as trucking, mechanical repair/maintenance and grain storage and processing. Over 30 percent of the County's labor force is employed in agriculture. The employment and unemployment patterns of the County directly reflect this agricultural labor pool; as farm employment drops, so does the overall employment average for the County. It is difficult to obtain accurate current farm labor statistics. As there is a vast demand for farm labor, a central farm labor housing project is in operation in Williams. The Williams Migrant Center provides 100 units for up to 400 seasonal residents. Based on recent conversations with the Colusa County Agricultural Commissioner's office, demographics have been changing at this facility, possibly due to the decline in the economy. Renee McCormick, the Fiscal Administrative Officer, indicated that folks from as far away as Tennessee and Alaska are now using the facility, altering the historic composition which was usually from California, Texas and Mexico.

The U.S. Census of Agriculture provides data regarding hired farm labor. Table 1.3-8 identifies the number of farms hiring workers in 1992, 1997, 2002, and 2007, and provides details regarding the number of days worked as well as the number of migrant laborers.

TABLE 1.3-8: HIRED FARM LABOR

	1992	1997	2002	2007
Farms Hiring Labor	446	447	380	343
% of All Farms	53%	55%	46%	42%
Workers	5,356	5,472	3,684	3,058
Number of Days Worked				
Workers – 150 days worked or more	1,525 – 28%	1,819 – 33%	1,451 – 39%	1,441 – 47%
Workers – Less than 150 days	3,831 – 72%	3,653 – 67%	2,233 – 61%	1,617 -
Migrant Labor				
Migrant Farm Labor	--	--	100 farms	62 farms
Percent of Farms Hiring Labor	NA	NA	26%	18%

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, 1992, 1997, 2002, AND 2007

TIMBER RESOURCES

Colusa County has approximately 23,000 acres of timber, which represents approximately 0.1 percent of the state's timber resources, according to the California Department of Fire and Forestry's 1996 assessment, which is most recent assessment with timber data available for Colusa County. Limited data is available regarding the timber resources in the County. The majority of timber lands, 21,000 acres, are located on federal lands in the County and the remaining 2,000 acres are on privately held lands (CalFIRE, 2009). None of the timber lands are in a designated Timber Production Zone.

The County's forest resources are primarily composed of the western oak group (84 percent), followed by other western softwoods, California mixed conifer, and tanoak/laurel groups, as shown in Table 1.3-9. Lands in the California mixed conifer and other western softwoods group are the most likely to provide timber resources.

TABLE 1.3-9: FOREST LAND BY FOREST TYPE AND OWNERSHIP

	Western Oak Group	California Mixed Conifer Group	Other Western Softwoods Group	Tanoak/Laurel Group	Total
Forest Service	43,875	1,641	11,195	6,114	62,825
Other Federal	16,296	--	9,412	--	25,707
Private	117,090	5,922	--	--	123,012
TOTAL	177,260	7,562	20,607	6,114	211,544

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, 2010

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2. TRANSPORTATION AND CIRCULATION

The existing physical and operational conditions for the Colusa County transportation system are described below. This description is organized by transportation system component, beginning with the regional roadway system followed by public transportation, non-motorized transportation, aviation, and goods movement.

This report is based on review of local and regional transportation plans and on physical review of the existing transportation system. Existing roadway traffic was determined using traffic counts performed by the County and the California Department of Transportation (Caltrans).

REGULATORY FRAMEWORK

Local

COLUSA COUNTY GENERAL PLAN

The Colusa County General Plan was adopted January 13, 1989. The General Plan Circulation Element contains numerous policies related to the circulation system and the various components of the transportation network in Colusa County. Some of the key general policies related to transportation and circulation include:

- **CIRC-1** Colusa County should pursue a circulation system that is consistent with the land use plan contained in this document. The following hierarchy of streets and highways should be used to describe this system: Principal Arterials, Minor Arterials, Major Collectors, Minor Collectors, and Local Streets. These road types are shown in Figure CIRC-1 and are defined in the first part of this chapter. Road standards applicable to each of these road types should be used by the Public Works Department in the planning of future road improvements.
- **CIRC-2** Existing transportation facilities should be utilized fully (Level of Service “C”, as defined in Table CIRC-3) before making major new capital improvements.
- **CIRC-3** Transportation facilities should be used to support the growth of the region and should not be deliberately used to constrain growth or cause social changes.
- **CIRC-4** Local streets, County roads, and State highways should remain the primary elements of the circulation system.
- **CIRC-5** Circulation facilities should be sited and designed in such a way that damage to the county’s scenic and environmental resources is avoided. Roads should be planned and designed to minimize disruption of soils, topography, vegetative cover, and wildlife habitat.

COLUSA COUNTY REGIONAL TRANSPORTATION PLAN

The Colusa County Local Transportation Commission (LTC) is the designated Regional Transportation Planning Agency (RTPA) for Colusa County. The Regional Transportation Plan (RTP) was last updated by the Colusa County LTC in 2008.

The RTP serves as the planning blueprint to guide transportation investments in the County involving local, state, and federal funding over the next twenty years. Transportation improvements are categorized as short-term (0-10 years) or long-term (11-20 years). The overall focus of the RTP is directed at developing a coordinated and balanced multi-modal regional transportation system that is

2. TRANSPORTATION AND CIRCULATION

financially constrained to the revenues anticipated over the life of the plan (2030). The coordination focus brings the County, City of Colusa and City of Williams, governmental agencies, Indian Tribal Governments, and citizens into the planning process. The balance is achieved by considering investment and improvements for moving people and goods across all modes including roads, transit, bicycle, pedestrian, goods, railroad, and aviation.

REGIONAL ROADWAY SYSTEM

Colusa County's preservation of agricultural land and concentration of growth within incorporated cities has created a unique transportation system compared to the rest of the Sacramento region. Most travel in the County is by automobile.

The roadway network within the unincorporated parts of the County is rural in character, mainly serving small communities and agriculture uses. Interstate 5 and State Routes 20 and 45 are the primary transportation corridors extending through the County and serve all of the County's major population centers, including Colusa, Williams, Arbuckle, and Maxwell. Other County arterials and a network of local public and private roads constitute the remainder of the roadway system.

Figure 2-1 shows the major routes in the regional roadway system according to operational classification. These classifications indicate the operational hierarchy of the roadway system. The state highway network serves primarily inter-city and inter-county regional travel, while the County's roadways serve local trips. Notable exceptions are Lone Star Road and Maxwell Road, which serve some inter-county trips and have traffic volumes as high as some of the state highways.

HIGHWAYS

Interstate Highways

Interstate routes are a part of the state highway system that is maintained by Caltrans. The unincorporated portion of Colusa County has one Interstate route, I-5.

I-5 is an important north/south route that in Colusa County primarily provides for the transportation of goods by trucks. The agricultural industry in Colusa County generates high truck traffic along I-5 during the harvest seasons. Existing daily travel on I-5 in Colusa County ranges from approximately 30,000 to 40,000 vehicles per day for average and peak conditions, respectively. From the Yolo County line to the Glenn County line, I-5 is a four-lane freeway and provides connections to the communities of Arbuckle, Williams, and Maxwell.

State Highways

State highways in Colusa County are listed below and include freeways and conventional highways, which are operated and maintained by Caltrans.

- State Route (SR) 16
- SR 20
- SR 45

SR 16 extends south as a two-lane conventional highway from SR 20 in Colusa County to Yolo County about three miles east of the Lake County line. SR 16 provides a connection to the Cache Creek Resort Casino located near the town of Brooks, passes through the Cache Creek Regional Park area and is one of

the routes used by trucks to access Yolo County. SR 16 is an eligible State Scenic Highway but is not officially designated. Existing daily traffic ranges from about 700 to 900 vehicles per day.

SR 20 is a two-lane rural highway with 12-foot lanes and paved shoulders that vary from two to six feet depending on location. SR 20 enters Colusa County at the Sutter County border near the town of Meridian, where daily traffic ranges from 8,000 to 10,000 trips. SR 20 is busiest through the City of Colusa, where volumes range from 20,000 to 26,000 vehicles per day. SR 20 exits Colusa County at the Lake County border, approximately 3.5 miles west of the intersection of SR 16 and SR 20, where daily travel is approximately 7,000 vehicles per day.

SR 45 is a two-lane rural highway with 12-foot lanes and paved shoulders that vary from two to six feet depending on location. It extends from the Yolo County border, with daily volumes of about 2,300 vehicles, to SR 20 east of the City of Colusa, where the facility merges with SR 20. SR 45 then re-emerges northwest of the City of Colusa, to Princeton and further north to Glenn County, where traffic volumes are roughly 2,300 vehicles per day.

SCENIC HIGHWAYS

California's Scenic Highway Program was created by the Legislature in 1963. The purpose of the program is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of the lands adjacent to highways. A highway may be designated scenic depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes on the traveler's enjoyment of the view.

In Colusa County, SR 16 from the Yolo County line to SR 20, as well as SR 20 from SR 16 to the Lake County line are designated as "eligible state scenic highway." Currently, no roadways within the County are officially designated as scenic highways. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program that is approved by Caltrans.

COUNTY ROADS

The County maintains approximately 716 miles of roadways – an extensive system that provides a high level of access compared to the relatively low levels of traffic on most roadways.

Numerous County roadways provide intermediate and localized access to rural areas of the County, as well as the more populated cities of Colusa and Williams and the communities of Arbuckle, Maxwell, and others. Most roads are two-lane roadways with substandard cross sections, limited shoulder widths, and poor pavement conditions. Years of insufficient funding to help the County maintain local roadways have resulted in serious maintenance issues that continue to plague the County.

Major County roads are also part of the regional roadway system and typically provide the connections to the highway and freeway system. Roads such as Walnut Drive, Maxwell Road, and Lone Star Road are key County roadways carrying more than 2,000 daily trips. These three roadways are heavily used by motorists traveling between Colusa, I-5, and SR 20.

ROADWAY CAPACITY AND LEVEL OF SERVICE

Level of Service (LOS) is a general measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an

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indication of the comfort and convenience associated with driving as well as speed, travel time, traffic interruptions, and freedom to maneuver. The LOS grades are generally defined as follows:

- **LOS A** represents free-flow travel with an excellent level of comfort and convenience and the freedom to maneuver.
- **LOS B** has stable operating conditions, but the presence of other road users causes a noticeable, though slight, reduction in comfort, convenience, and maneuvering freedom.
- **LOS C** has stable operating conditions, but the operation of individual users is substantially affected by the interaction with others in the traffic stream.
- **LOS D** represents high-density, but stable flow. Users experience severe restriction in speed and freedom to maneuver, with poor levels of comfort and convenience.
- **LOS E** represents operating conditions at or near capacity. Speeds are reduced to a low but relatively uniform value. Freedom to maneuver is difficult with users experiencing frustration and poor comfort and convenience. Unstable operation is frequent, and minor disturbances in traffic flow can cause breakdown conditions.
- **LOS F** is used to define forced or breakdown conditions. This condition exists wherever the volume of traffic exceeds the capacity of the roadway. Long queues can form behind these bottleneck points with queued traffic traveling in a stop-and-go fashion.

The level of service designation for roadways in Colusa County is based on the system presented above, which uses letters to describe the ability of a particular roadway to “serve” traffic on a daily and peak hour basis. Service levels for this study were calculated by comparing the average daily traffic volumes on a given roadway to standard daily thresholds for that type of road, shown in Table 2-1. The average daily traffic thresholds are initially calculated on a peak hour capacity basis and then modified to reflect daily traffic conditions. This is accomplished using a peak period percent of traffic for that particular type of roadway.

TABLE 2-1. OPERATIONAL CLASS AND PEAK HOUR LEVEL OF SERVICE THRESHOLDS					
Operational Class	Daily Level of Service Capacity Threshold				
	A	B	C	D	E
Minor County Highway	900	2,000	6,800	14,100	17,400
Major County Highway	1,200	2,900	7,900	16,000	20,500
2-Lane, Arterial	--	--	9,700	17,600	18,700
4-Lane, Arterial, Undivided	--	--	17,500	27,400	28,900
4-Lane, Arterial, Divided	--	--	19,200	35,400	37,400
6-Lane, Arterial, Divided	--	--	27,100	53,200	56,000
8-Lane, Arterial, Divided	--	--	37,200	71,100	74,700
2-Lane, Class I Highway	1,200	3,700	7,600	13,600	21,000
2-Lane, Class II Highway	1,700	4,100	8,200	16,600	21,200
4-Lane Major Freeway	25,400	41,600	58,400	71,000	79,200

NOTES: BASED ON THE 2000 HIGHWAY CAPACITY MANUAL, CHAPTERS 20 AND 22, WHICH PROVIDED MAXIMUM PEAK HOUR FLOWS. THE VALUES IN THIS TABLE WERE CONVERTED TO DAILY TRAVEL USING THE PEAK PERIOD PERCENT (APPROXIMATELY 10 PERCENT) FOR THESE FACILITIES. SOURCE: FEHR & PEERS, 2009.

Figure 2-2 shows the existing daily traffic volumes on the regional roadway system. Those volumes compared to the standard thresholds produce the LOS shown in Table 2-2. Most County roads operate at LOS A, B, or C, which represents stable operating conditions, at the average daily traffic (ADT) level.

Roadway segments of Lone Star Road, Lurline Road, and Maxwell Road operate at LOS C, where drivers can be substantially affected by other drivers on the roadway. State Route 20 east of Colusa operates at LOS E.

TABLE 2-2: EXISTING DAILY TRAFFIC VOLUMES

Route	Segment	Facility Type	Existing ADT	Lanes	LOS
I-5	South of Arbuckle	Freeway	35,800	4	B
I-5	Arbuckle to Williams	Freeway	39,400	4	B
I-5	North of Williams	Freeway	32,800	4	B
SR 20	East of Colusa	Class I Highway	20,900	2	E
SR 20	Colusa to Williams	Class I Highway	4,200	2	C
SR 20	West of Williams	Class II Highway	7,100	2	C
SR 45	South of SR 20	Class I Highway	2,200	2	B
SR 45	North of Colusa	Class I Highway	2,300	2	B
SR 16	Lake County Line	Class II Highway	800	2	A
Wildwood Rd.	South of Hillgate Rd.	Minor County Highway	1,420	2	B
Hillgate Rd.	Wildwood Rd. to Cortina School Rd.	Minor County Highway	978	2	B
Cortina School Rd.	Hillgate Rd. to Hahn Rd.	Minor County Highway	568	2	A
Hahn Rd.	Lone Start Rd. to Grimes-Arbuckle Rd.	Minor County Highway	947	2	B
Grimes-Arbuckle Rd.	Hahn Rd. to Tule Rd.	Minor County Highway	600	2	A
Tule Rd.	Grimes-Arbuckle Rd. to Poundstone Rd.	Minor County Highway	1,231	2	B
City College Rd.	North of White Rd.	Minor County Highway	1,178	2	B
Lone Star Rd.	Myers Rd. to Abel Rd.	Minor County Highway	2,041	2	C
Abel Rd.	East of Lone Star Rd.	Minor County Highway	747	2	A
Lone Star Rd.	Abel Rd. to SR 20	Minor County Highway	1,883	2	B
Zumwalt Rd.	Myers Rd. to Walnut Drive	Minor County Highway	989	2	B
Walnut Drive	West of Zumwalt Drive	Minor County Highway	1,620	2	B
Zumwalt Drive	North of Walnut Drive	Minor County Highway	1,578	2	B
Freshwater Rd.	West of I-5	Minor County Highway	642	2	A
Wilson Avenue	North of SR 20	Minor County Highway	579	2	A
Lurline Avenue	SR 45 to I-5	Minor County Highway	3,103	2	C
Maxwell Sites Rd.	East of McDermott Rd.	Minor County Highway	1,599	2	B
Maxwell Rd.	I-5 to 4 Mile Rd.	Minor County Highway	2,735	2	C

NOTES: BOLD VALUES INDICATE OPERATIONS THAT DO NOT MEET CONCEPT REPORT LOS STANDARDS.

Policy CIRC-2 of the 1989 Colusa County General Plan establishes that roadways would operate no worse than LOS C within the unincorporated areas of the County. Roadways within incorporated cities were analyzed based on the local jurisdiction’s roadway LOS thresholds. State facilities were analyzed based on Caltrans’ LOS thresholds contained in the individual transportation or route concept reports for each facility.

TRAFFIC SAFETY

To assess safety needs in the County, a three-year summary analysis of collision data on state routes was compiled (2006-2008). As Table 2-3 shows, the majority of collisions occurred in the unincorporated portions of the County. In this time period, seven fatal collisions occurred on unincorporated roadways, with most occurring on I-5 and SR 20. During this same period, 222 injuries were reported from collisions on the same facilities. Figure 2-3 provides a map showing collision locations where there were more than 11 incidents over the three year period.

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TABLE 2-3: COLUSA COUNTY THREE-YEAR COLLISION SUMMARY INCORPORATED AND UNINCORPORATED LOCATIONS							
Year	State Route	Total Collisions	Fatal Collisions	Injury Collisions	Property Damage Only	Victims Killed	Victims Injured
Incorporated							
2006	5	33	0	10	23	0	13
2006	20	21	0	6	15	0	8
2006	45	4	1	2	2	1	4
Total		58	1	18	40	1	25
Unincorporated							
2006	5	90	1	28	62	1	41
2006	16	5	0	3	2	0	3
2006	20	26	0	7	19	0	13
2006	45	16	0	3	13	0	4
Total		137	1	41	96	1	61
Incorporated							
2007	5	37	0	8	29	0	15
2007	20	15	0	5	10	0	9
2007	45	2	0	1	1	0	2
Total		54	0	14	40	0	26
Unincorporated							
2007	5	81	3	36	45	5	66
2007	16	4	0	1	3	0	1
2007	20	41	2	17	24	4	25
2007	45	11	0	7	4	0	11
Total		137	5	61	76	9	103
Incorporated							
2008	5	25	0	7	18	0	7
2008	20	5	1	3	2	1	6
2008	45	1	0	1	0	0	1
Total		31	1	11	20	1	14
Unincorporated							
2008	5	67	0	31	36	0	40
2008	16	1	0	0	1	0	0
2008	20	45	1	23	22	1	37
2008	45	11	1	6	5	1	10
Total		124	2	60	64	2	87
Three Year Total							
		541	10	205	336	14	316

SOURCE: CALIFORNIA HIGHWAY PATROL SWITRS DATABASE; FEHR & PEERS, 2009

Table 2-4 compares the 1999 accident rates (accidents per 1,000,000 miles of vehicle travel) on Colusa County state routes with the Caltrans District 3 statewide average for similar facilities. As the table shows, Colusa County was below the District 3 average for 2- and 3-lane facilities, non-freeway, and freeways. Countywide data from SWITRS (the California Highway Patrol's Statewide Integrated Traffic

Records System) for the years 2005 through 2007 shows that the accident rate for all state facilities in the County has increased slightly to 0.48 in 2005, 0.48 in 2006, and 0.50 in 2007.

TABLE 2-4: TRAFFIC ACCIDENT RATE (ACCIDENTS/1,000,000 MILES OF TRAVEL) ON COLUSA COUNTY STATE HIGHWAYS

Facility	Colusa County	District 3	Ratio
2 & 3 Lane	1.01	1.12	0.90
Non-Freeway	0.96	1.04	0.92
Freeway	0.24	0.51	0.47
Total All Facilities	0.40	0.74	0.54

SOURCE: 1999 ACCIDENT DATA ON STATE HIGHWAY, CALTRANS

PUBLIC TRANSPORTATION SYSTEM

Public transportation within Colusa County is provided by Colusa County Transit Agency (CCTA) through a general public paratransit service. The bus service currently operates Monday through Friday, between the hours of 7:00 AM and 5:00 PM, with the exception of County holidays. The bus service operates on a Dial-A-Ride basis and includes five routes – three that operate five days a week and two that operate only on select days. CCTA has 10 full time staff, including six drivers, one mechanic, and three administrative staff. The CCTA has 11 vehicles with 19-passenger capacity, and each can accommodate two wheelchair positions.

The CCTA completed a recent planning study to identify transit needs for routes, facilities, personnel, and equipment.

The CCTA currently provides medical escort services for residents who need transportation to medical services outside of Colusa County. Transportation is provided to Yuba City, Chico, Woodland, Sacramento, and Roseville, where needed services such as dialysis are available.

Table 2-5 shows transit operational information for FY 2005/06 through FY 2007/08.

TABLE 2-5: COLUSA COUNTY TRANSIT AUTHORITY OPERATING DATA SUMMARY

Fiscal Year	Ridership	Vehicle Hours	Vehicle Miles	Passengers Per Hour	Passengers Per Mile
05/06	52,535	8,150	159,799	6.4	.33
06/07	51,998	8,625	159,238	6.0	.33
07/08	54,588	9,501	168,996	5.7	.32

SOURCE: COLUSA COUNTY TRANSIT AUTHORITY

Since FY 05/06, ridership has increased approximately four percent. During this same three year period, vehicle hours increased approximately 16 percent and vehicles miles six percent. The number of passengers per vehicle hour has declined slightly since FY 05/06.

Figure 2-4 shows the CCTA routes and Dial-A-Ride service coverage.

BICYCLE AND PEDESTRIAN SYSTEM

Except for the Central Valley Bike Trail paralleling I-5, the County has no formal bicycle facilities that provide regional interconnection. However, the cities of Colusa and Williams and the communities of

2. TRANSPORTATION AND CIRCULATION

Arbuckle and Maxwell have some bicycle lanes striped on several facilities that provide primarily local access but do not connect to regional bike facilities.

Bicycle demand is expected to continue to grow. Planned bicycle facilities are shown in Figure 2-5. These facilities are intended to link developed areas with adjacent areas (such as the cities of Colusa and Williams) for alternative mode travel and recreational travel.

In addition, demand within the cities of Colusa and Williams, as well as communities such as Arbuckle, will be facilitated by local bike facilities linking major routes together.

AVIATION SYSTEM

Colusa County has one public general aviation airport, one special-use airport, one heliport, and numerous landing strips used primarily for crop dusters. The Colusa County Airport is a public general aviation airport that has one 60' x 3000' asphalt-concrete and concrete surfaced runway, 22 T-hangars and three conventional hangars. Two of the conventional hangars are leased for aerial agricultural chemical applicator and the remainder is used by the Fixed Based Operator (FBO) for aircraft repair. Medium-intensity runway lights are provided from dusk to dawn. A special-use airport is privately owned by Williams Gliderport, providing flight-training, general aviation, and rides in glider aircraft. The heliport is located at the Colusa County Hospital and is used for medical-related aerial transportation needs.

Operations in the past five years have been relatively stable. The Colusa County airport estimates that it operates 28,000 landings or departures per year. Residents generally travel by vehicle to Sacramento or the Bay Area for long-distance air travel. The Colusa County Airport does not offer commercial air charter service. Limousine service is available to the Sacramento and Bay Area airports. While many flight operations out of the Colusa County airport are agricultural-related (given the County's high production of rice), flights also include business, recreational, hunters, emergency, and law enforcement. Currently, 36 aircraft are based at the Colusa County airport.

Regularly scheduled major airline service is available from the Sacramento International Airport, 30 miles south of the County line, along I-5. The Sacramento Airport handled 10.6 million passengers and 172 million pounds of airfreight in 2008. The Colusa County Airport, with a 3,000 ft. paved runway has 24-hour fuel service, flights, Unicom, and published instrument approach.

GOODS MOVEMENT SYSTEM

Existing trends in truck traffic are expected to continue. Agricultural products will continue to move primarily by truck, and truck traffic will grow modestly. However, truck travel continues to be the primary source of roadway degradation for local facilities. In addition, truck travel mixed with agricultural uses results in roadway conditions that are substantively different during harvest seasons (late summer/fall) than in non-agricultural counties. Thus, truck traffic will continue to drive the need for roadway restoration and maintenance for years to come.

Table 2-6 provides a summary of the 2007 truck volumes on Colusa County state facilities. The highest volumes occur on I-5 and SR 20 in the Williams area and on SR 45 near Grimes-Arbuckle Road.

TABLE 2-6. TRUCK VOLUMES ON COLUSA COUNTY STATE HIGHWAYS

Route	Limits	Truck Percentage of Total Traffic
I-5	Williams, E Street	29.1
I-5	Back Jct. SR 20	29.1
I-5	Ahead Jct. SR 20	28.6
SR 16	Ahead Jct. SR 20	14.2
SR 20	Back Jct. SR 16	14.6
SR 20	Ahead Jct. SR 16	10.7
SR 20	Back Jct. Williams I-5	10.7
SR 20	Ahead Jct. Williams I-5	19.0
SR 20	Back Colusa, Jct. SR 45	8.0
SR 20	Ahead Colusa, Jct. SR 45	7.0
SR 20	Ahead Colusa, Fremont Street	7.0
SR 45	Back Grimes-Arbuckle Road	19.0
SR 45	Ahead Grimes-Arbuckle Road	19.0
SR 45	Back Jct. SR 20	12.1
SR 45	Ahead Jct. SR 20	12.1
SR 45	Ahead Colusa, Lurline Avenue	7.3
SR 45	Back Country Road P29	9.0

SOURCE: CALTRANS 2007 TRUCK VOLUMES

RECREATIONAL TRAVEL

Northwestern Colusa County is one of the gateways to the Mendocino OHV (Off-Highway Vehicle) Corridor. This corridor connects the Fouts Springs/Davis Flat OHV Staging Area, located in Colusa County, and the Middle Creek OHV Staging Area in Lake County, and contains 200 miles of what is considered some of the most challenging and enjoyable OHV routes in the nation. This venue has created a substantial volume of recreational trips and this trend will likely continue.

RAIL FREIGHT TRANSPORTATION

The California Northern Railroad Company provides freight service throughout the County and operates 254 miles of track within California, linking freight customers in Northern California with the Union Pacific Railroad. The mainline tracks traverse the County adjacent to I-5. The company operates a 110-mile railroad line that runs from the City of Davis in Colusa County to the town of Tehama near Red Bluff. The connections to Union Pacific allow goods to be shipped within their network that serves 23 states in the western two-thirds of the United States. Transported commodities include lumber, wine, beer, food products, agricultural products, steel pipe, manufactured goods, and construction materials.

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Insert Figures:

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3. COMMUNITY SERVICES AND FACILITIES

This section addresses community services and facilities within Colusa County. Utility services include the provision of water services, wastewater services, solid waste disposal, electricity and natural gas. Public Safety services include law enforcement, fire protection and emergency medical services. Public facilities include schools, parks, and libraries.

This chapter is divided into the following sections:

- Utility Services (3.1)- Water, Wastewater, Solid Waste, Electricity, Natural Gas
- Public Safety Services (3.2)- Fire, Law Enforcement,
- Schools (3.3)
- Parks and Recreation (3.4)
- Libraries and Other Community Facilities (3.5)

3.1 UTILITY SERVICES

3.1.1 WATER

Water supplied to Colusa County comes from two sources: groundwater and surface water. All domestic water systems in the County are supplied with groundwater, while most irrigation systems are supplied with surface water from the Tehama-Colusa or Glenn-Colusa Canals, the Colusa Drain, or the Sacramento River. The surface water supplies available for use in Colusa County are significant. Surface water is used on 74 to 86 percent of the irrigated land within the Sacramento Valley portion of the County. Whereas, groundwater is used on 10 to 22 percent of that land. Of the land where groundwater is used, 6 to 11 percent is not within the service area of any organized entity.

There are community water systems located in Arbuckle, Maxwell, Princeton, Grimes, Stonyford, and the Cities of Colusa and Williams. There are also numerous private groundwater wells located throughout the County that serve individual parcels throughout the unincorporated areas of the County.

KEY TERMS

Acre feet: The volume of one acre of water to a depth of one foot. Each acre-foot of water is equal to approximately 325,851.4 gallons.

BGS: Below ground surface.

GPD: Gallons per day.

GPM: Gallons per minute.

Groundwater: Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth's surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called "aquifers" and are the source of drinking water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

3. COMMUNITY SERVICES AND FACILITIES

MG: Million gallons

MGD: Million gallons per day

Surface water: Water collected on the ground or from a stream, river, lake, wetland, or ocean. Surface water is naturally replenished through precipitation, but is naturally lost through evaporation and seepage into soil.

REGULATORY FRAMEWORK

STATE

California Department of Health Services

The Department of Health Services, Division of Drinking Water and Environmental Management, oversees the Drinking Water Program. The Drinking Water Program regulates public water systems and certifies drinking water treatment and distribution operators. It provides support for small water systems and for improving their technical, managerial, and financial capacity. It provides subsidized funding for water system improvements under the State Revolving Fund (“SRF”) and Proposition 50 programs. The Drinking Water Program also oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and oversees the Drinking Water Treatment and Research Fund for MTBE and other oxygenates.

California Code of Regulations

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminants levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

Urban Water Management Planning Act

The Urban Water Management Planning Act has as its objectives the management of urban water demands and the efficient use of urban water. Under its provisions, every urban water supplier is required to prepare and adopt an urban water management plan. An “urban water supplier” is a public or private water supplier that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. The plan must identify and quantify the existing and planned sources of water available to the supplier, quantify the projected water use for a period of 20 years, and describe the supplier’s water demand management measures. The urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Department of Water Resources must receive a copy of an adopted urban water management plan.

Senate Bill (SB) 610 and Assembly Bill (AB) 901

The State Legislature passed SB 610 and AB 901 in 2001. Both measures modified the Urban Water Management Planning Act.

SB 610 requires additional information in an urban water management plan if groundwater is identified as a source of water available to an urban water supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over given time periods. AB 901 also requires information on the manner in which water quality affects water management strategies and supply reliability. The bill requires a plan to describe plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

Senate Bill (SB) 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a “sufficient water supply” exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

LOCAL

Colusa County Groundwater Management Plan

Most of the information in the following sections was derived from the Colusa County Groundwater Management Plan (2008). The Groundwater Management Plan (GMP) covers the entirety of Colusa County and contains various groundwater management goals; Basin Management Objectives, which are measurable parameters or criteria related to data that can be scientifically collected; an Action Program, which includes specific actions that will be implemented to manage groundwater resources and to develop a better understanding of the groundwater resources; and a Groundwater Management Process, which should be followed in order to achieve the goals stated in the GMP. The GMP does not regulate the actions of procedures of water districts and non-County water providers within Colusa County.

Colusa County’s groundwater management goals represent the overarching intent of the County with regard to groundwater management. Basin Management Objectives and Management Actions must be consistent with these Groundwater Management Goals, and must contribute to achievement of the goals. Colusa County’s goals for groundwater management (as developed with input from the public through Plan Advisory Committee meetings, workshops, and surveys) are to:

- Ensure a Reliable Water Supply

3. COMMUNITY SERVICES AND FACILITIES

- Ensure Long-Term Groundwater Sustainability
- Optimize Conjunctive Use of Surface Water and Groundwater
- Protect Water Rights
- Maintain Local Control
- Prevent Unnecessary Restrictions on Groundwater Use

COLUSA COUNTY CODE, CHAPTER 35: WELL STANDARDS

Chapter 35 of the Colusa County Code contains minimum requirements for the construction, reconstruction, repair, and destruction of water wells, cathodic protection wells, and monitoring wells. This section requires states that No person shall dig, bore, drill, deepen, modify, repair, or destroy a water well, cathodic protection well, observation well, monitoring well or any other excavation that may intersect ground water without first applying for and receiving a permit as provided in this ordinance unless exempted by law. Except as otherwise specified, the standards for the construction, repair, reconstruction, or destruction of wells shall be as set forth in the California Department of Water Resources Bulletin 74-81 "Water Well Standards, State of California" except as modified by subsequent revisions.

COLUSA COUNTY CODE, CHAPTER 43: GROUNDWATER MANAGEMENT ORDINANCE

The Colusa County Groundwater Management Ordinance states that it is essential for the protection of the health, welfare, and safety of the residents of the county, and the public benefit of the state, that groundwater resource of Colusa County be protected from harm resulting from the extraction of groundwater for use on lands outside the county, until such time as needed additional surface water supplies are obtained for use on lands of the county, or over-drafting is alleviated, to the satisfaction of the board. The county seeks to foster prudent water management practices to avoid significant adverse overdraft-related environmental, social, and economic impacts. It is therefore essential for the protection of the county's important groundwater resources that the county require a permit to extract groundwater for use outside the county. This chapter requires a permit for the export of groundwater outside the county and is not intended to regulate groundwater in any other way.

ENVIRONMENTAL SETTING

GROUNDWATER BASINS

As described in the Colusa County Groundwater Management Plan, there are seven groundwater basins within Colusa County: the Stonyford Town Area, Bear Valley, Little Indian Valley, Funks Creek, Antelope Valley, Blanchard Valley, and Sacramento Valley Groundwater Basins. Of these, all except the Sacramento Valley Groundwater Basin are small (less than 15 square miles) isolated basins located in the Coast Ranges in the central to western portions of the County. These small basins have not been divided into subbasins. The Stonyford Town Area and Funks Creek Groundwater Basins also extend into Glenn County.

The Sacramento Valley Groundwater Basin, in contrast to the smaller basins described above, covers over 5,900 square miles and 10 counties, and has been divided into 18 subbasins. The California Department of Water Resources defines the following:

“A groundwater basin is defined as an alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined features that significantly impede groundwater flow such as rock or sediments with very low permeability or a geologic structure such as a fault.”

“A subbasin is created by dividing a groundwater basin into smaller units using geologic and hydrologic barriers or, more commonly, institutional boundaries. These subbasins are created for the purpose of collecting and analyzing data, managing water resources, and managing adjudicated basins.”

Colusa County overlies portions of two subbasins of the Sacramento Valley Groundwater Basin: the Colusa and West Butte Subbasins. The Colusa Subbasin underlies the entire valley portion of the County west of the Sacramento River, and also extends into Yolo, Glenn, and Tehama Counties. The West Butte Subbasin underlies the portion of the County east of the Sacramento River, and also extends into Glenn and Butte Counties. Groundwater basins in Colusa County are shown in Figure 3.1.1-1.

Geology

Overview of Groundwater and Geology

Groundwater is water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. There are three main types of subsurface geology where groundwater can exist:

- Hard rock – Groundwater can be present in cracks or fractures in the rocks.
- Underground caverns – Groundwater can fill these underground voids.
- Porous sediments – Groundwater can fill the pore spaces between grains of sand and gravel.

In Colusa County, groundwater can be found in both hard rock and porous sediments. In the mountainous portions of the County, groundwater exists primarily in hard rock aquifers; in the valley portions of the County, groundwater exists primarily in porous sediments, or alluvial aquifers.

In the western portion of the County, the surface and subsurface are made up of igneous and metasedimentary rocks. In these areas, groundwater is present in the cracks and fractures in the rocks. In order for groundwater in this material to be replenished after it is removed by pumping, the fractures must receive recharge from precipitation or a renewable water source such as a river or stream, which must have an available supply of water to recharge the fractures. The fractures in hard rock can be irregular and disconnected, which can explain why two wells in a hard-rock setting can be very close together, but may have very different yields and water quality. Additionally, the groundwater available to supply and recharge wells in hard rock aquifers can vary significantly with seasonal and year-to-year variations in rainfall.

In the central-western portion of the County, the surface and subsurface are made up of marine sediments. Marine sediments are not typically as hard as the igneous and metasedimentary rocks, but function much like hard rock aquifers. The marine sediments were deposited under a salt-water environment, so water quality can be poor and often deteriorates with depth. Groundwater aquifers in marine sediments can be irregular and disconnected so nearby wells can have very different yields and water quality.

In the valley portions of the County, both in the small valleys in the Coast Ranges and in the Sacramento Valley, the subsurface consists of layers of gravel, sand, clay, and in some cases volcanic ash. Groundwater is present in the pore spaces between the particles that make up the alluvial aquifers. The characteristics of different aquifers, as well as the zones within each aquifer, are related to the materials that comprise the aquifer (sands, gravels, clays, etc.). Within a single aquifer zone, nearby wells with similar construction can have very similar yields and water quality. It should be noted that many of the

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geologic formations that contain alluvial aquifers are continuous units which extend to adjacent counties.

Smaller valleys often contain a very limited amount of sediment and thus have less capacity to store groundwater. For this reason, changes in the balance of recharge and pumping can quickly cause significant changes in groundwater conditions in small valleys. It is possible for small valleys to experience a significant decrease in water level during a single year if pumping exceeds recharge. In contrast, the larger storage capacity in larger valleys can in many cases accommodate fluctuations in the recharge/pumping balance over a number of years, with smaller variations in water levels.

It is difficult to characterize groundwater in the igneous and metasedimentary rocks and marine sediments over large areas. Groundwater in these areas is generally limited, and data on water levels and water quality have not been collected. Additionally, the nature of hard rock aquifers makes them difficult to study. Groundwater is not continuous over large areas, so data from one area may be completely unrelated to data in another area. In the small alluvial valleys in the Coast Ranges, there is very limited data available to characterize their groundwater systems; however, if data were collected and analyzed, these valleys could likely be well-characterized because groundwater is probably continuous within these valleys. Due to the large amount of data which has been recorded and studied regarding the Sacramento Valley, it is generally understood that groundwater is continuous within specific aquifer zones (although discontinuous between different aquifer zones) over large areas within the Sacramento Valley. In light of the large amount of data for the Sacramento Valley and lack of data for the remaining valleys, further discussion will focus on the Sacramento Valley.

Status of Understanding of Regional and Local Geology

The geology of the Sacramento Valley has been studied for at least 95 years, and much has been learned over this time. However, there are still many areas of active study and debate. In Colusa County, areas that are not well-understood include:

- The nature and extent (location and depth) of the deposits that eroded from the Sutter Buttes.
- The interaction between the Coast Range-sourced Tehama Formation and analogous Sierra Nevada-sourced deposits, and where this interaction occurs.
- The possible existence of subsurface barriers to groundwater flow within the County.
- The nature and extent of different aquifer units within the Tehama Formation.

Regional Geology and Structure

The Sacramento Valley Groundwater Basin acts as a trough that is filled with layers of different sediments. The deepest portions of the Basin generally consist of marine sedimentary rocks, ranging in age from Late Jurassic to early Miocene. These marine units are overlain by younger alluvial and locally prominent volcanic rocks of early Miocene to Holocene age. Within the Basin, these deposits are disrupted by deformational stresses derived from east-west compressional forces associated with regional uplift along the western margin of the valley and extensional forces within the Basin and Range Provenance. Over time, these forces have applied great stresses and strain on valley deposits, creating complex and diversely-oriented fold and fault structures.

Recent Alluvial Deposits

Recent alluvial deposits include stream channel deposits, basin deposits, the Modesto Formation, and the Riverbank Formation. These deposits were created by moving stream channels that meandered, cutting through existing sediments within the valley and creating an interconnected relationship. As

such, it is likely that many channels or pathways exist that allow groundwater to move among all of the recent alluvial deposits. There is limited data in well logs to allow for differentiation among the different recent alluvial deposits.

Stream channel deposits are Holocene in age and were deposited between 11,000 years ago and present day. The stream channel deposits occur along the current and ancestral paths of streams and rivers in Colusa County. Where present, the stream channel deposits extend from ground surface to a depth of one to 200 feet below ground surface (bgs). The stream channel deposits consist of unconsolidated gravels, sand, silt, and clay, derived from the erosion and reworking of the Quaternary stream terrace deposits (Modesto and Riverbank Formations) and the Tehama Formation. This unit is moderately to highly permeable, but because of its shallow depth and limited thickness, it possesses limited water-bearing capacity.

Basin deposits are Holocene in age and, like stream channel deposits, were deposited between 11,000 years ago and present day. Basin deposits occur where sediment-laden floodwaters breached natural stream and river levees and spread across lower-lying topography. Where present, the basin deposits extend from ground surface to a depth of 1 to 200 feet bgs. The basin deposits consist mainly of silt and clays. These units have low permeability and generally yield small quantities of water to wells.

The Modesto Formation is Pleistocene in age and was deposited between 2 million and 500,000 years ago. The Modesto Formation is a stream terrace deposit consisting of gravels, sands, and clays derived from the reworking and deposition of the Riverbank Formation. The Modesto Formation was probably deposited by the same stream and river systems that flow today, because it generally borders existing channels (Blake et. al., 1999). Where present, the Modesto Formation begins between ground surface and 100 feet bgs and extends to a depth of approximately 200 feet bgs. The units of the Modesto Formation are moderately to highly permeable and can yield limited quantities of water to wells.

The Riverbank Formation is Pleistocene in age and was deposited between 2 million and 500,000 years ago. The Riverbank Formation consists of pebbles and small cobble gravels, inter-layered with reddish clay, sands, and silts. Like the Modesto Formation, the Riverbank Formation is a stream terrace deposit; however, the Riverbank Formation is older than the Modesto Formation. The Riverbank Formation has two units. The lower unit of the Riverbank Formation is lithologically similar to the Red Bluff Formation (which occurs further north in the Sacramento Valley) and has a similar brick-red color. It occurs on the higher of two terraces that have been cut and filled into the surface of the Red Bluff and/or Tehama Formations. The upper unit of the Riverbank Formation consists of extensive flat stream terraces along major creeks in the valley (Helley and Harwood, 1985). The Riverbank Formation begins between ground surface and 150 feet bgs and extends to a depth of approximately 200 feet bgs. The Riverbank Formation is moderately to highly permeable and can yield moderate quantities of water to wells.

Sutter Buttes Alluvium

The Sutter Buttes Alluvium is an alluvial fan deposit observed in the subsurface, which may range in thickness up to 600 feet thick (DWR, 2000). These fan deposits consist largely of gravels, sands, silts, and clays, and may extend up to 15 miles north of the Sutter Buttes and west beyond the Sacramento River. Certain zones within this unit yield large quantities of water (DWR, 2004).

Tehama Formation

The Tehama Formation is Pliocene in age and was deposited between four million and one million years ago. The Tehama Formation was deposited by coalescing alluvial fan deposits from the Coast Ranges, and consists of interbraided gravel, sand, silt, and clay. The Tehama Formation outcrops in the low

foothills of the Coast Ranges at the western edge of the Sacramento Valley. Throughout the flat areas of the western Sacramento Valley, the Tehama Formation is overlain by one or more of the younger deposits described above. Toward the center of the Sacramento Valley, near the Sacramento River, the Tehama Formation interfingers with the Sierra Nevada - and Cascade Mountains - sourced Tuscan and Laguna Formations. Within the Tehama Formation, the gravel, sand, and silt materials are separated into distinct zones by impermeable and semipermeable layers of clay and other fine-grained materials. The gravel and sand zones are generally less than 50 feet thick, and may lack lateral continuity. Although the Tehama Formation is the principal water-bearing formation in the western half of the Sacramento Valley, the units of the Tehama Formation have not been studied in detail in Colusa County. The Tehama Formation begins between ground surface (in the outcrop areas) to 200 feet bgs and becomes thicker toward the center of the Sacramento Valley, extending to a depth of up to 1700 feet bgs. The units of the Tehama Formation are moderately permeable, but because of its extent and thickness, the Tehama Formation can yield moderate to high volumes of water to wells.

Tuscan Formation

The Tuscan Formation has been the subject of much interest in recent years, but records from gas wells indicate that it is likely only present in the very northeastern corner of Colusa County and consequently is not a major water source for the County.

Groundwater Levels

The California Department of Water Resources (DWR) maintains a publicly available on-line database, which includes groundwater level data for the County. DWR's Water Data Library Website can be found at <http://www.wdl.water.ca.gov/>. Wells monitored by DWR and cooperating agencies are identified by the State Well Numbering System. Data can be obtained for specific wells by means of a map interface, by groundwater basin, or by the assigned State Well Numbering System.

The 77-year period of record for water level measurements in Colusa County depicts a groundwater system that has experienced changing conditions over time. In areas of high groundwater use and differing water conditions, water levels fluctuate, sometimes dramatically, in response to changes in groundwater use and hydrologic conditions. In areas of lower groundwater use and more stable water conditions, water levels have not exhibited significant fluctuations over times. In areas where agricultural water needs are met with surface water, wells generally exhibit more stable conditions.

Groundwater levels decreased during the 1975 to 1977 drought then increased slightly until 1982. At that point, surface water from the Tehama Colusa Canal became available, and groundwater levels increased quickly from 1982 through 1986. Seasonal water level fluctuations decreased during this period from about 20 feet to less than 10 feet, indicating a reduction in groundwater pumping. Groundwater levels declined from 1988 through 1994, when deliveries from the TCC were only 25-65 percent of normal, and have generally increased from 1994 through present. Groundwater levels in this well are currently about 50 feet higher than they were in 1970.

The direction of Spring groundwater flow within the County has not changed from 1977 to 2006. It generally follows the topography of the County, flowing from the Coast Ranges toward the Sacramento Valley (west to east), and north to south within the Valley. Spring groundwater elevations were about five to 30 feet higher in 2006 than in 1977, depending upon the area.

Data from the two nested monitoring wells at the extensometer sites in the County shows that for the four years of available data, the spring groundwater elevations in the monitored aquifer zones have been very similar, within three feet of one another.

Groundwater Quality

DWR maintains a database for groundwater quality that can be obtained from the Water Data Library for specific well sites within Colusa County, identified by the assigned State Well Numbering System. Data can also be obtained by groupings of wells.

For the purpose of evaluating overall water quality, there are multiple approaches that can be used. The most common are specific conductance or total dissolved solids, which are indicators of the total concentration of minerals in the water. Lower specific conductance or concentrations of total dissolved solids generally indicate better water quality, while higher specific conductance or concentrations of total dissolved solids generally indicate poorer water quality. For Colusa County, specific conductance was selected as an indicator of overall water quality, because there were more records for specific conductance than for total dissolved solids.

Specific conductance within the County is generally acceptable for agricultural and domestic use, with the exception of two areas. In the marine sediments in the foothills of the Coast Ranges, specific conductance is marginally acceptable for domestic use and can reduce the yield of a number of crops grown in the County. An area of anomalously high specific conductance is located north of SR 20 between Colusa and Williams. Specific conductance in this area is generally unacceptable for domestic use and can reduce the yield of many crops grown in the County.

Boron concentrations in the County are generally acceptable except for an area southwest of Arbuckle, where concentrations of boron can be problematic for several crops grown in the County. Nitrate concentrations typically meet drinking water standards. Where present, elevated concentrations of nitrate are likely a result of inadequate sanitary seals or point sources (i.e. septic systems). Manganese concentrations are elevated in the eastern portion of the County, at levels that may cause aesthetic problems (odor or staining) for domestic and municipal uses, but generally below levels that could represent a health risk.

Surface Water Flow and Quality

Historic data for Colusa County are inadequate to evaluate the changes in surface flow or quality that directly affect groundwater levels or quality, or are caused by groundwater pumping. To make these determinations, it is necessary to have clustered monitoring wells located immediately adjacent to a surface water body, with a stage gauge located in the immediate vicinity. Even with these grouped monitoring locations (which do not currently exist in Colusa County), the flow in a stream or river may be so great that any interactions among groundwater and surface water are smaller than the measurement error.

Groundwater Infrastructure

According to DWR records dating to 1912, Well Completion Reports have been filed for 2,902 wells in Colusa County, and records of well destruction have been filed for 44 wells. Well Completion Reports are not always filed with DWR, even though they are now required, so these figures likely underrepresent the actual totals for the County. Of the wells for which Well Completion Reports have been filed, 1,211 are domestic wells, 767 are irrigation wells, 485 have unknown or other uses, 152 are test wells, 149 are monitoring wells, 50 are stock-watering wells, 48 are municipal wells, and 40 are industrial wells.

Domestic wells were constructed at a rate of approximately 16 per year from 1950 through 1989, but have been constructed at a rate of approximately 31 per year since then, likely as a result of the

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increasing population in the County. Irrigation wells tend to be constructed more frequently during drought periods, in the mid- 1970's and early 1990's. On average, 13 irrigation wells are constructed per year; on average, 20 to 30 wells per year are constructed during droughts. Municipal well construction has been sporadic and has been one to four per year.

The average depth of domestic wells has fluctuated since the 1930's, but has generally been about 200 feet deep. The average depth of irrigation wells has fluctuated significantly, but has been about 200 feet deeper than the average depth of domestic wells in any give year, or an average of about 400 feet deep. Municipal well depths are inconsistent and vary widely, from about 150 to 850 feet deep; combined with the small number constructed annually, calculation of an average depth of new municipal wells would not be meaningful.

WELLS

According to Department of Water Resources (DWR) records dating to 1912, Well Completion Reports have been filed for 2,902 wells in Colusa County, and records of well destruction have been filed for 44 wells. Well Completion Reports are not always filed with DWR, even though they are now required, so these figures likely underrepresent the actual totals for the County. Of the wells for which Well Completion Reports have been filed, 1,211 are domestic wells, 767 are irrigation wells, 485 have unknown or other uses, 152 are test wells, 149 are monitoring wells, 50 are stock-watering wells, 48 are municipal wells, and 40 are industrial wells.

Domestic wells were constructed at a rate of approximately 16 per year from 1950 through 1989, but have been constructed at a rate of approximately 31 per year since then, likely as a result of the increasing population in the County. Irrigation wells tend to be constructed more frequently during drought periods, in the mid- 1970's and early 1990's. On average, 13 irrigation wells are constructed per year; an average of 20 to 30 wells per year are constructed during droughts. Municipal well construction has been sporadic and has been one to four per year.

DOMESTIC WATER SYSTEMS

Arbuckle Public Utility District

The Arbuckle Public Utility District provides domestic water service to 820 connections, or a population of approximately 2,500. Arbuckle has four groundwater wells, but generally only runs one or two at a time. The most recent well was drilled in 2008. The average amount of water pumped each day is approximately one MG, with a yearly total of approximately 350 MG. Total pumping capacity is 3.6 MGD. Most of the original pipes have been replaced with AC pipes, though some small ductile iron pipes remain in use. The distribution system consists of mostly 6-inch, 8-inch, and 10-inch pipes. Water is treated with chlorine at the wellheads as it is pumped out of the ground. There are no major problems with the system and there are no planned upgrades or changes. The most recent change in the system was the addition of the new well in 2008 (Scheimer, 2009).

The current system has the capacity to pump an additional 2.6 MGD above existing pumping levels. This additional pumping capacity is adequate to serve approximately 2,132 additional connections without making any significant upgrades to the system. The existing water distribution infrastructure is in good working order (Scheimer, 2009).

Colusa County Waterworks District #1

The Colusa County Waterworks District #1 provides potable water to 100 residential connections, five commercial connections, and one agricultural connection in the community of Grimes. The District has one primary well 223 feet deep, and one back-up well. The District provides approximately 36 MG of water annually. July is the peak flow month with five MG. The water supply infrastructure in the District is comprised of pipes ranging in size from 2-inch to 8-inch diameter. While the 2-inch pipes are generally PVC or metal, the larger pipes are generally AC. Water is treated with sodium hypochlorite for Coliform bacteria. The Colusa County Waterworks District #1 also provides water to 10 fire hydrants as part of an agreement with the Sacramento River Fire Protection District. However, this water is not sufficient to maintain fire flows and the Sacramento River Fire Protection District must also rely on water tenders to help achieve adequate supply.

On February 5, 2009 the Colusa County LAFCO Executive Officer presented a staff report to the LAFCO Commission regarding the Municipal Service Review (MSR) and Sphere of Influence (SOI) Update for services provided by Colusa County Waterworks District #1. The MSR concluded that the proposed SOI will support planned land uses shown in the Colusa County General Plan and Zoning Code. The MSR further identifies the need for future upgrades to the water distribution system, and the establishment of a fee program to fund future infrastructure upgrades in order to ensure that adequate water is available in the future. Based on the LAFCO analysis of the water availability in the 2009 MSR, there are adequate supplies available to meet projected residential growth in this area, consistent with the County General Plan Land Use designations.

Maxwell Public Utilities District

The Maxwell Public Utilities District receives all water for municipal purposes from groundwater sources. The District pumps with a total of three wells, Well 1, Well 4 and Well 5 (Well 5 came online in 1997). The District has an elevated steel storage tank with a 100,000-gallon storage capacity.

The District's three wells have the following capacities (1998 Department of Health Services Annual Inspection):

- Well 1 @ 250 GPM
- Well 4 @ 550 GPM (has limitations for drinking water)
- Well 5 @ 425 GPM

Total: 1,225 GPM maximum pumping capacity although the District cannot run Well 4 which is 550 GPM capacity in series with running Well 5.

The District's sources produce 1,225 GPM (of which 550 GPM meets drinking water standards but has an undesirable odor), well above the District's annual, monthly and peak day demand of 119.17 MG, 17.05 MG, and .64 MGD respectively. The District serves 402 connections (residential, commercial, and agricultural) for a total service population of approximately 1,000 people. Peak water usage is 1,384 GPD per Equivalent Dwelling Unit (GPD/EDU). Maximum daily pumping capacity is 2,016,000 GPD compared to an average daily pumping demand of 326,493 GPD. Demand is well below the District's source capacity.

The District's distribution system is set in a grid pattern with approximately seven dead-ends (1998 Department of Health Services Annual Inspection Report). The District's water system was upgraded in 1983. The system is composed entirely of C-900 PVC pipe ranging from 4-inch up to 8-inch installed (C-

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900 PVC) with cast-iron valves, new hydrants, and metering equipment. The District has a main pressure zone with approximately 52 to 54 pounds per square inch (psi) at all times. The District has four backflow prevention devices on the system. The distribution system is properly maintained and is in good working order.

In order to meet the increased demand that would be generated through development of the residential parcels identified in the existing General Plan land use map, the District would need to add one or two new wells to the system. Additionally, new development sites would need to extend conveyance infrastructure to the site. The District has already begun engineering work and studies to establish a new well (Well #6). It is feasible that this new well could be online and operational within 1-2 years.

Princeton Water Works District

The Princeton Water Works District provides water service to approximately 110 residential and commercial customers. The District extracts groundwater from two different wells, drilled in 1984. The South Well is the principal well (utilized 90 percent of the time) and is equipped with a 20-horse power motor. This well was drilled to 307 feet bgs, with a 12-inch casing and a pumping capacity of 200 GPM. The North Well is predominantly used as an emergency well when the South Well is at or near capacity. The North Well has a pumping capacity of 120 GPM. Each well is equipped with an 1,800-gallon hydro-pneumatic pressure storage tank and auto-chlorination system (LAFCO, 2007).

The District pumps 50,000 GPD in winter months and between 250,000 and 280,000 GPD in the summer months. The District is able to meet peak water usage of up to 300,000 GPD during high demand periods. The average peak water usage is 2,545 GPD (LAFCO, 2007).

The initial distribution system infrastructure consisted of 4-inch welded Steel Pipe. The entire distribution system was reconstructed in 1984 with a combination of 4-inch (3,320 feet), 6-inch (6,050 feet) and 8-inch (2,100 feet) AC pipe. The distribution system is currently in good working order (LAFCO, 2007). Each well has a 1600-gallon pressure tank and chlorination system for a total combined storage of 3,200 gallons. The District's water pressure usually fluctuates between 45 to 65 psi (LAFCO, 2007).

The District has adequate water capacity from two wells to serve the 110 existing connections (residential, schools and commercial) with average demands of 50,000 to 60,000 GPD in winter months, and 250,000 to 280,000 GPD in the summer months. According to the District, it can meet peak demands of up to 300,000 GPD, which is below the District's capacity of 320 GPM. At 320 GPM, at peak flows, the District can pump up to 460,800 gallons per day (LAFCO, 2007).

With respect to the number of additional connections, during peak summer usage days, a remaining pumping capacity of 180,800 GPD ($460,800 - 280,000 = 180,800$) could support up to 71 more water connections (assuming current water usage of 2545 GPD, which is based on a peak usage of 280,000 divided by the number of connections being 110) (LAFCO, 2007). If more than 71 additional connections were required, the District would need to explore the possibility of adding new wells to the system. Groundwater levels in the area would support additional pumping from new wells.

Stonyford Water District

The Stonyford Water District is a County Service Area. The water system was upgraded in 2007-2008 to include a \$1.1 million water infiltration system. There are approximately 60 municipal hookups on the Stonyford system, 55 of which are private residences and five are allocated to the U.S. Forest Service. Water is drawn from two local wells, one of which serves as a backup to the primary well. The main well

has a pumping capacity of 20 GPM, and both the main well and the backup well are in generally good condition. A 75,000 gallon containment tank is located adjacent to the main well, and a 300,000 gallon storage tank is located south of Stonyford, near the landfill. Water from the 300,000 gallon storage tank is conveyed from the tank to the municipal distribution system via a system of 8-inch and 10-inch lines that feed into the 3-inch and 4-inch lines that connect directly to users. The larger distribution lines are relatively new and are in good condition, however, the smaller municipal conveyance lines are aging and in need of repair and upgrade.

Although water for the Stonyford system is pumped from the ground via wells, it has been determined by DWR and the federal government that the water pumped from the ground is hydrogeologically connected to Stony Creek, and is therefore, classified as a surface water source. The Stonyford water system is allocated up to 40 acre-feet/year of water from this source. The allocation between October 1 and May 31 is 30 acre-feet and the allocation between June 1 and September 31 is 10 acre-feet. The system has historically exceeded this allocation. However, once a tiered pricing system for water use was implemented there have not been exceedences of this allocation. The allocation of water to the Stonyford system is administered by the Federal Water Master, based in Oroville, CA. New municipal hookups and the drilling of new wells require approval from the Federal Water Master, and applications are reviewed on a case-by-case basis. In general, the current hookups use the majority of the annual water allocation, and growth in the area is constrained by a lack of available water (Hackney, 2009).

Century Ranch

The Century Ranch Subdivision, developed in the mid-1960's, is located in northwest Colusa County, adjacent to the East Park Reservoir. Groundwater supplies in this portion of the County are very limited. Wells drilled in this area typically encounter hard rock formations without significant water storage or availability. Certain wells at Century Ranch are placed in, or near, the creek bed of Little Stony Creek, and collect underflow from the Creek.

From the outset, water source capacity has been a critical problem for the Century Ranch Subdivision. Water shortages during peak summer and early fall demand periods have been an annual concern, and have necessitated severe water restrictions and water conservation mandates in dry years (i.e., a ban on all outdoor water use during these critical months). Despite these concerns, the already critical source capacity situation worsened through the early 1990's as the Century Water Company continued to add new service connections. In response to the Company's noncompliance with California Health and Safety Code requirements to provide a reliable and adequate supply of potable drinking water, the California Department of Health Services issued a compliance order in 1994, which imposed a service connection moratorium on the Century Ranch Water Company and its successors and assignees.

In 1996 Colusa County acquired ownership of the Century Ranch water system, and designated it County Service Area No. 1 (CSA #1). The County has taken steps to try to solve the critical water shortage problems faced by this water system, however, these actions have been largely unsuccessful. In 1998, with funding from the State's Safe Drinking Water Bond Law program, certain improvements were made to the Century Ranch water system. These improvements included a new 250,000 gallon bolted steel tank and the construction of Well No. 7, which is equipped with a 50 GPM pump. However, like other wells at Century Ranch, its ability to provide adequate water during the late summer and early fall months is very limited, and it has added no significant source capacity to the water system.

In the summer months of 2001, with funding assistance from the California Emergency Clean Water Grant program, the County added an 80 GPM bag and cartridge system and made disinfection improvements to allow the use of surface water, collected as underflow from Little Stony Creek. While

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the use of this surface water has provided an additional approved source for the Century Ranch water system, the ability to capture underflow decreases significantly in late summer and early fall. In very dry years the underflow has reportedly decreased to the point that no significant quantities of water can be taken from Little Stony Creek. During drought condition years both the underflow in Little Stony Creek and the groundwater supplies are known to approach failure simultaneously. Thus, while the operation of the surface water treatment facilities does allow reduced usage of well sources, its net effect on the overall supply capacity is insufficient to ensure an adequate, reliable water supply. New residential units cannot be constructed in Century Ranch until new, long-term, and reliable supplies of water are found to serve the area.

City of Colusa

The City of Colusa provides potable water within the city limits, as well as the following areas outside of its boundaries: the Lurline Avenue area, the area east of Bridge Street, and restrooms at Moon Bend Road. The Walnut Ranch development, which is located in the City's SOI, currently receives water from the Del Oro Water Company. However, the analysis in the City's 2009 Water Master Plan assumes that this area will eventually receive treated water from the City. As described in the City's 2009 Water Master Plan (Eco:Logic, 2009), the City's well network has been gradually expanded over the years and now consists of five wells and a distribution system. The City relies on three of its wells to meet day-to-day demands and utilizes the two other wells as back-up supply. Two elevated tanks provide 0.25 MG of storage which supplements peak demands and maintains system pressure.

As of 2006, there were 2,126 active water service connections within the City. Of these connections, 1,914 were for residential customers, 195 were for commercial/institutional customers, and the remainder for industrial and other users. All water used by the City comes from five wells. The depth of these wells exceeds 200 feet bgs, and each well is encased with a deep-water sanitary seal for a minimum of 50 feet to prevent infiltration. Water is treated with chlorine after it is pumped out of the ground and before it is conveyed to users.

The current well capacity with all wells operating simultaneously is approximately 7.0 MGD; however, the reliable well capacity is 4.9 MGD which is based on the largest well being out of service. The storage tanks provide about 1.2 MGD, and increase the total reliable system capacity to 6.1 MGD. As described in the 2009 Water Master Plan, the current peak hour demand for existing customers is approximately 5.8 MGD. The peak hour demand of 5.8 MGD can be reliably supplied with the capacity from the storage tank and four wells (6.1 MGD), with the largest well out of service.

The 2009 Water Master Plan includes an analysis of water demand associated with full buildout of the City's SOI. The Water Master Plan estimates that full buildout of the SOI will require an average of 6.8 MGD and a maximum day demand of 18.6 MGD.

Water supply, treatment, storage, pumping and distribution improvements have been identified in the Water Master Plan to meet future water demands and to correct existing deficiencies within the current system.

Remedies to eliminate existing deficiencies include providing additional source capacity through construction of two new wells with treatment, adding sequestering to Wells 4, 5, and 6 if needed, and eliminating the small diameter pipelines in the downtown area. Improvements to increase system capacity to serve future growth include provision of additional wells with treatment and extension of the distribution system. Additional storage and a booster pump stations may also be necessary depending on the capacity of future wells.

Distribution system improvements were developed to serve future growth. The most prominent feature of the future distribution system expansion is the construction of an outer loop around the City comprised of 12-inch diameter pipelines. The outer loop interconnects with existing pipelines to create further looping within the system, which increases operational flexibility and fire flows. The pipelines have been sized so that future wells or tanks/booster pumps can be anywhere on the perimeter and maintain flows, which will allow flexibility as future improvements are sited.

Future source capacity will be provided from new wells throughout the system. Future wells are expected to provide at least 1,300 GPM, but capacities could be higher. Seven new wells will be needed to serve future growth. If future wells have higher capacity, then fewer wells will be needed. New storage and pumping facilities may be included at some point in the future to reduce the number of new wells and treatment systems needed, but should be delayed until the capacity of new wells is determined. The Colusa Water Master Plan identifies the location of new conveyance infrastructure and well locations that would adequately serve full buildout of the SOI.

The Water Master Plan includes a proposed water serve connection charge for new development within the City's water service area.

In summary, the City of Colusa has adequate water supplies and distribution infrastructure to meet existing demand for potable water. The Water Master Plan includes specific and detailed measures to increase water supplies to meet full buildout of the SOI. The Water Master Plan includes specific measures to amend the current water fee program and increase connection charges in order to fund the identified improvements to meet water demand for full buildout of the SOI. The City's water distribution system has been designed to provide for maximum flexibility regarding the location of new wells and connections to the water distribution system that runs around the perimeter of the City. New residential growth in the SOI would occur in close proximity to existing water conveyance infrastructure. New residential development would be able to connect to the existing distribution system along the boundary of the city limits without the need to construct significant new conveyance infrastructure. By implementing the improvements identified in the Water Master Plan, the City of Colusa would ensure adequate supplies are available to meet new residential growth within the SOI. This does not pose a constraint to the development of housing within the Colusa SOI.

City of Williams

The City of Williams provides water service to 1,245 connections. The majority of these connections are residential. Only eight connections are outside of the city boundaries, in the unincorporated area of Colusa County. In 2008, water usage totaled 2,085,711 gallons. The City of Williams Public Works Department operates and maintains the water system. The system includes five wells, three of which are active while the other two wells are for stand-by only. The total capacity of all five wells totals 3,050 GPM. The system includes one 100,000 gallon water storage tank, but more storage capacity is needed. The average water usage is 13.5 MG per month. Peak usage in the summer is .814 MGD and 20.7 MG per month. Using Well 5 exclusively, the City could pump 1.7 MGD or .9 MG more than the current day usage (LAFCO, 2007). Two additional wells at the Plank Industrial Park can each produce 2000 GPM, equivalent to 5.7 MGD.

The City's water distribution system consists of approximately 69,000 linear feet of 6-inch to 12-inch diameter pipeline. Approximately 15 percent of the distribution system was replaced in 1996, which eliminated undersized and failing pipeline. The existing water distribution system provides sufficient domestic and fire flows to the City. The City continues to upgrade the water distribution system as funding becomes available.

3.1.2 WASTEWATER

Wastewater in Colusa County is treated and disposed of using one of several methods. The primary methods are onsite disposal and centralized disposal. There are five communities in the County served by centralized wastewater disposal systems: Arbuckle, Maxwell, Princeton, and the Cities of Colusa and Williams. The areas served by onsite systems are generally more rural or agricultural in nature. Although most onsite systems serve an individual dwelling or commercial establishment, some serve groups of homes or businesses.

KEY TERMS

Effluent: Effluent is an outflowing of water from a natural body of water, or from a man-made structure. Effluent in the man-made sense is generally considered to be water pollution, such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities. In the context of waste water treatment plants, effluent that has been treated is sometimes called secondary effluent, or treated effluent.

NPDES: Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

WWTP: Wastewater treatment plant. Treatment of wastewater may include the following processes: screening to remove large waste items; grit removal to allow sand, gravel, and sediment to settle out; primary sedimentation where sludge can settle out of the wastewater; secondary treatment to substantially degrade the biological content of the sewage; tertiary treatment to raise the quality of the effluent before it is discharged; and, discharge.

REGULATORY FRAMEWORK

In California, all wastewater treatment and disposal systems fall under the overall regulatory authority of the State Water Resources Control Board (SWRCB) and the nine California Regional Water Quality Control Boards (RWQCBs), who are charged with the responsibility of protecting beneficial uses of State waters (ground and surface) from a variety of waste discharges, including wastewater from individual and municipal systems. Colusa County falls within the jurisdiction of the Central Valley RWQCB.

The RWQCB's regulatory role often involves the formation and implementation of basic water protection policies. These are reflected in the individual RWQCB's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction, and maintenance of on-site sewage disposal systems. The SWRCB's role has historically been one of providing overall policy direction, organizational and technical assistance, and a communications link to the State legislature.

The RWQCBs may waive or delegate regulatory authority for on-site sewage disposal systems to Counties, Cities or special districts. Although not mandatory, it is commonly done and has proven to be administratively efficient. In some cases this is accomplished through a Memorandum of Understanding (MOU), whereby the local agency commits to enforcing the Basin Plan requirements or other specified standards that may be more restrictive. The RWQCBs generally elect to retain permitting authority over

large and/or commercial or industrial on-site sewage disposal systems, depending on the volume and character of the wastewater. The established protocol for involvement of the RWQCB in permitting and review is established by a routine understanding between the County and the RWQCB.

Community Systems Regulation

The RWQCB has direct oversight and permitting responsibility for large-flow systems of greater than 2,500 GPD and community systems, unless the RWQCB chooses to waive that authority and delegate their oversight to the County on a case-by-case basis. Some community systems in Colusa County fall within Public Utility Districts (PUDs), which have assumed responsibility for oversight and/or maintenance of the infrastructure. In these cases the PUD is considered the responsible party (discharger) under terms of the permit issued by the RWQCB.

Individual On-site Sewage Disposal System Regulations

Regulation of individual on-site sewage disposal systems in unincorporated Colusa County occurs at a variety of levels, including by the SWRCB, through the Central Valley RWQCB, and locally, by the County. Recently, the State of California enacted legislation that will require the establishment of statewide standards for on-site sewage disposal systems.

Counties typically regulate septic systems via their Environmental Health and/or Building or Planning Departments. In Colusa County, septic systems are regulated by the Department of Health and Human Services. Local septic system ordinances often incorporate portions of the Uniform Plumbing Code and other specific requirements.

The following sections describe the primary regulatory mechanisms in place for on-site sewage disposal systems.

Regional Water Quality Control Board Basin Plan for the Central Valley

The Central Valley RWQCB has adopted policies and requirements pertaining to on-site sewage disposal systems, commonly referred to as the Basin Plan.

The on-site sewage disposal systems element of the Basin Plan sets forth various objectives, guidelines, general principles and recommendations for the use of on-site sewage disposal systems that cover a variety of topics. Mandatory requirements for the siting and design of on-site sewage disposal systems are reflected in the Basin Plan. Included for all on-site sewage disposal systems are specific criteria related to separation distances to groundwater, setbacks to water features, soil conditions, percolation rates, special design systems, and leachfield replacement area. Further discussion of these criteria is provided later in this section.

Assembly Bill 885 (AB 885)

AB 885 was passed by the California Legislature in September 2000, and mandates the establishment of statewide standards to regulate the placement and use of on-site wastewater treatment systems (OWTS). The SWRCB has been charged with developing this critical set of uniform statewide standards for on-site sewage disposal systems that are required to be incorporated into all RWQCB Basin Plans in the near future. For the past several years the SWRCB has been in the process of developing statewide regulations for on-site wastewater treatment systems per AB 885. The key aspects of the proposed regulations include:

Site Evaluation Practices. The proposed regulations will mandate more thorough and consistent soil and site evaluation practices for all new and repair/replacement OWTS for verification of soil depth and

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groundwater levels. Current practices focus primarily on attaining minimum horizontal setbacks and determination of groundwater separation, not on determination of soil texture, structure or depth. Proposed definitions for soil (especially rock content and weathered bedrock) will require more thorough and extensive soil profile evaluations and stricter interpretations of suitability than under current practices.

Operation and Maintenance (O&M) Manuals. The proposed AB 885 regulations require the preparation of an O&M manual for all new and repair/replacement OWTS. This will require that the County adopt regulations or policies mandating the preparation and submission of an O&M manual for all new and repair/replacement OWTS. The County will also have responsibilities for reviewing and maintaining official copies of these documents.

Septic Tank Risers and Effluent Filters. Access risers to “near” grade and the use of effluent filters will be required under the proposed regulations. These requirements will apply to new standard systems as well as supplemental treatment systems, and for any tank replacements.

Supplemental Treatment Systems. The proposed regulations have minimum vertical separation requirements that will lead to increased use of supplemental treatment systems. Minimum vertical separation is the depth of continuous unsaturated, undisturbed earthen material between the bottom of the dispersal system and the top of the seasonal high groundwater level, impermeable strata, or bedrock.

Dispersal System Siting and Design Criteria. The proposed dispersal system siting and design requirements are generally consistent with and/or less restrictive than the current RWQCB Basin Plan. Many of the requirements are structured to allow for more latitude in the use of supplemental treatment to overcome soil depth/suitability constraints for OWTS. Based on the soil definitions in the proposed regulations, there is likely to be an increased need to specify supplemental treatment systems and shallow dispersal designs (including mounds) for sites that may have been permitted for conventional trench designs under current practices.

Groundwater Quality and Septic Tank Monitoring. The proposed AB 885 regulations will mandate new groundwater sampling and septic tank inspections requirements for new and existing OWTS. The proposed regulations do not explicitly require the County to enforce this requirement or to collect and maintain any of the results from sampling that is performed. However, as the local agency responsible for implementing the regulations, at a minimum, the County would be obligated to provide some level of oversight for these activities, the details of which would likely have to be specified in the RWQCB MOU or the Conditional Waiver from the SWRCB.

Record Keeping. The proposed requirements specify only that system owners maintain copies of the Record Plan and the O&M Manual for the OWTS. The County, as the implementing authority will also be required to collect, review and maintain records of these same items.

ON-SITE SYSTEMS

On-site systems, commonly referred to as septic systems, are useful for handling the wastewater disposal needs of individual dwellings or commercial establishments for which connection to community facilities is not feasible. An on-site system consists of a septic tank that receives wastewater, allows the heavier solids to settle in the tank, and releases the remainder to an attached leach field. The leach field consists of underground perforated parallel lines through which water can seep into the surrounding soil. The solids which settled out of the wastewater in the septic tank must be periodically removed.

Septic tanks work well in areas of low density development where there is sufficient room to separate leach lines from potable water wells and lines. On-site systems are relatively inexpensive, easy to maintain, and contribute to water recharge in the area. However, on-site systems require certain soil conditions, topography, and water table conditions in order to work. If the proper conditions are not present, the leach field can become saturated and groundwater may become contaminated.

A serious problem associated with on-site systems is the potential for groundwater contamination. On-site systems that serve commercial or industrial establishments may dispose of chemicals that are not adequately filtered prior to being leached into the soil. For industrial properties where groundwater contamination is a concern due to chemical waste, chlorine injection or evaporation ponds must be provided in order to ensure safe disposal of sewage.

On-site systems were once common in the communities of Arbuckle, Maxwell, and Princeton. With the increase in water consumption and the use of appliances such as dishwashers and washing machines, it became increasingly difficult to have adequate room on each lot for leach fields to properly dispose of wastewater. As more homes were constructed at higher densities, the lots were consequently too small for a proper leach field and centralized systems became necessary and appropriate.

The communities of Grimes, College City, Century Ranch, and Stonyford dispose of locally generated wastewater through individual on-site septic systems. Rural residences located throughout the County, but outside of the communities listed above are also served by on-site septic systems.

COMMUNITY SYSTEMS

The communities of Arbuckle, Colusa, Maxwell, Princeton, and Williams are served by community systems for wastewater disposal and treatment, as described in greater detail below.

Arbuckle Public Utility District

The Arbuckle Public Utility District has provided sewer service to the residents of Arbuckle since 1953. The Arbuckle Public Utility District currently serves 820 connections. The older portions of the system convey wastewater through clay pipes, but development within the last 20 years has installed mostly PVC pipes (Scheimer, 2009).

Wastewater is conveyed from individual homes and businesses to the treatment facility located on Bailey Road. With the exception of a lift station at the WWTP, the system is operated by gravity flows. The WWTP includes a clarifier, a digester, and seven evaporation/percolation ponds. The ponds provide sufficient surface area for evaporation and filtration so no effluent is discharged. The Arbuckle facility treats approximately 0.27 MGD. The plant capacity is 0.5 MGD (Scheimer, 2009).

Based on full build out of the District and the District's existing SOI, an additional gross 300 acres (including roads, curb and gutters, and sidewalks) could be developed. Assuming .75 of each gross acre could be developed, a total 225 net developable acres exist in the existing SOI and assuming 8,000 square foot residential lots, the District and SOI would have the capability to accommodate an additional 1,225 EDU. Based on an average of 384 GPD per connection, the system could accommodate an additional 1,303 total EDU at 384 GPD/EDU (LAFCO, 2005).

This additional system capacity far exceeds potential residential growth identified in the existing General Plan. Individual projects may need to construct wastewater conveyance infrastructure to connect project sites to the existing wastewater conveyance system.

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Maxwell Public Utilities District

The Maxwell Public Utilities District has provided sewage treatment to the Maxwell community since 1973 and currently serves approximately 414 customers. The Maxwell Public Utility District WWTP is located on the southeast end of town adjacent to I-5. The plant is owned and operated by the Maxwell Public Utility District. The treatment plant consists of headworks with a communicator, one aeration lagoon and three oxidation lagoons, chlorine contact and dechlorination with the effluent dissipating into a local agricultural ditch that flows toward Lurline Creek.

The design and permitted capacity (RWQCB order R5-2002-0022) rating for the plant is for an average of 0.2 MGD. The plant was designed and built in 1973-74. The average flow is approximately 0.14 MGD. During wet weather, flows in the plant appear to be significantly impacted by Infiltration and Inflow (I and I). These flows can be about seven times the average, recording 0.6 MGD at times. All wastewater is collected through gravity, cement-pipe sewer system installed in the 1940s (Maxwell PUD Wastewater Treatment Plant System Improvements Report, 2002).

The District provides secondary treatment by way of aeration lagoon, three oxidation ponds, and a chlorine contact basin and dechlorination.

The collection system consists primarily of 6-inch and 8-inch concrete pipes and 12-inch clay pipes. Since 1982, work has progressed on replacing many of the concrete pipes with PVC. The pipes are currently being replaced at a rate of approximately 400 feet per year. The entire west side of the District's collection system consists of approximately 70-year old concrete piping. These stretches of pipe are antiquated and need to be replaced as soon as funding and time allows. The remainder of the Districts collection system is PVC and clay and is considered in good condition.

The wastewater treatment facility has the permitted capacity to service approximately 1,000 new connections, which is more than adequate to meet the residential growth identified in the existing General Plan. The biggest challenge the District is facing is regulations that took effect in 2009 regarding surface water discharges and the District's NPDES permit (the present system will not meet these new NPDES requirements). The stricter effluent limitations have made the District reconsider its present method of wastewater treatment to land disposal. The District is in the process of acquiring 273 acres of land for land disposal rather than moving to a more advanced form of treatment (tertiary). Acquisition of land will enable the District to increase wastewater capacity.

The District is continuing to coordinate with the United State Department of Agriculture (USDA) to secure funding for this land purchase. Additionally, the District is continuing to coordinate with the United States Fish and Wildlife Service to ensure that any potential impacts to special-status species on the land proposed for acquisition are properly mitigated. The District has been actively engaged in the land acquisition process since 2007, and staff is optimistic that the process will end successfully in the near future.

Princeton Water Works District

The Princeton Water Works District has provided wastewater treatment for the community of Princeton since 1969. The WWTP is located on a 30-acre site north of town and includes a lift station, a concrete lined aeration ditch, and two evaporation/percolation ponds. The facility treats approximately 18,260 GPD, but has a capacity of 40,000 GPD (LAFCO, 2007).

The District provides wastewater services to about 105 customers (connections), with an average wastewater flow of 0.034 MGD or 324 GPD per connection. The System consists of a WWTP, a pump

station and collection system made up of a 6-inch and 8-inch epoxy lined AC pipe. According to the Princeton Water Works District, approximately 369 people live in the District's service area (LAFCO, 2007). The two holding ponds facilitate further treatment and disposal by evaporation and percolation. Typically, one stabilization pond is used; the second pond is maintained for future expansion and operational maintenance purposes.

The method of discharge is as follows: Raw sewage from the collection system drains to a pump station. From there, it is pumped to an aeration ditch. The sewage is retained in the aeration ditch for approximately 40 hours, during which time it is aerated by means of a cage rotor. The effluent leaves the aeration ditch through a weir structure and flows into evaporation/percolation ponds.

Assuming 0.034 MGD average wastewater flow (324 GPD average per connection) with the total wastewater permitted/design capacity of 0.040, the District is nearly at its capacity and could serve an additional 19 connections to a total of 124 connections. This figure assumes the average wet weather flows do not exceed the maximum permitted and design capacity of the system. The design/permitted capacity and Waste Discharge Requirement Order #94-013 requires the system to not exceed a monthly average wastewater flow of 40,000 GPD. This is also the maximum flow that the system can accommodate (LAFCO, 2007).

The District has not developed a Capital Improvements Plan, although they prepared an Engineering Report in 2005 - *The Water and Sewer Feasibility Study* - that outlines various system deficiencies and recommended solutions. While not the same as a Capital Improvements Plan, this study does identify various equipment deficiencies and the necessary upgrades to promote more efficient operation, along with the cost of implementation and financing suggestions. Possible funding sources include a Rural Utility Service within USDA Rural Development, which provides affordable financial assistance to develop and improve water and wastewater disposal systems in rural areas and towns with populations under 10,000. Funds are available to public entities such as municipalities, counties, special purpose districts and corporations operated on a non-profit basis.

The Princeton Water Works District should be eligible for the Small Communities Grant Program. The program is State funded as funds allow. If all grant funding has been exhausted, the State Revolving Fund program could loan at rate of 2.5 percent amortized over twenty years. A Revenue Program will be required together with environmental documents prior to obtaining a loan from this program (LAFCO, 2007).

City of Colusa

The City of Colusa operates a wastewater treatment facility at 2820 Will S. Green Road in Colusa, about a mile southwest of downtown. The facility was constructed in 1949, but was updated with new equipment in 2008. The new equipment includes a "Bio-lac" secondary aeration process, tertiary filtration, ultraviolet (UV) disinfection system sludge storage basins, and daily and monthly equalization storage ponds (NPDES Permit No. CA0078999). The old pond infrastructure may be used for emergency storage. The City's existing wastewater collection system covers an area of approximately 900 acres and provides service to almost 5,700 residents as well as commercial and industrial users. The City owns, operates, and maintains a network of over 26 miles of sewer pipelines (ranging in size from 4- to 18-inches in diameter), force mains, and six existing pump stations, which convey an average dry weather flow of 0.58 MGD from the City's service area to the City of Colusa WWTP (Ecologic, 2009).

According to the NPDES permit, the facility can treat and discharge up to 0.7 MGD. According to the 2010 Draft MSR for the City of Colusa, the design capacity of the WWTP is 0.9 MGD. The effluent

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discharges to an unnamed tributary which leads to Powell Slough. At the existing level of development, during average daily dry weather flows, model simulations predict all pipes to be flowing at less than 80 percent capacity with no manholes surcharging. Average daily dry weather flow is 0.58 MGD at the City of Colusa's WWTP (Ecologic, 2009).

The 2009 City of Colusa Wastewater Collection System Master Plan (Master Plan) included an analysis of two phases of future growth within and surrounding the City. Phase I included infill of the existing city limits, redevelopment of parcels as defined in the General Plan, and "Special Consideration" areas. Special Consideration areas are existing areas outside the city limits that are currently on septic systems and future developments, which were identified by the City as likely to be accommodated within the existing collection system in the near-future. Phase II included build-out of the remainder of the General Plan SOI.

With the addition of flow from Future Developments – Phase I, the modeled peak hourly wet weather flow during the 10-year, 6-hour design storm event was estimated to be 4.2 MGD at the City's WWTP. These peak hourly wet weather flows resulted in an increase in overflows, capacity-limited pipelines, and manhole surcharging. The majority of pipelines within the City are impacted by downstream conditions. These downstream restrictions are directly related to pump station capacity, specifically at the Screens, Primary, South Wescott, and Wye pump stations. Of the surcharged pipelines, the only pipelines that exceed the established surcharging criteria are the 8-inch line from the intersection of 3rd Street and Parkhill Street to the intersection of 9th Street and Harris Street. This portion of the collection system, referred to as the 6th Street Trunk, is a shallow trunk with manhole depths less than four feet, which does not allow for any surcharging (Ecologic, 2009).

Full development of Phase II is estimated to double the wastewater flow to 7.6 MGD and sufficient capacity does not exist in the existing collection system to accommodate this flow. New trunk sewers and upsizing of the Primary and South Wescott pump stations will be necessary to convey all future flow to the WWTP (Ecologic, 2009). However, as described and discussed in the City of Colusa 2010 Draft MSR, based on a design capacity of .9 MGD at its WWTP, the City has a adequate capacity to provide wastewater services to 3,352 EDU. The City has 2,123 units at this time and 177 acres of vacant land with a potential build out of 721 dwelling units. The City has an additional capacity to accommodate 1,229 additional units of which 508 could be developed within its SOI (LAFCO, 2010).

The Master Plan identifies numerous system improvements that would expand treatment and conveyance capacity to a level that would serve full buildout of the City's SOI. Total capital costs would reach approximately \$20.6 million at 2009 construction rates (Ecologic, 2009).

City of Williams

The City of Williams owns and operates the collection, treatment, and disposal system, and provides sewage service to the City of Williams and limited portions of the surrounding area and the SOI. The wastewater system collects wastewater and conveys it to the City's treatment plant located approximately one half mile north of the city limits along I- 5.

Current average dry weather flow (ADWF) is around 3.0 MGD (75 GPD/capita) and the current average annual flow is about 0.34 MGD (85 GPD/capita). Based on an ADWF of 250 GPD/EDU there are currently approximately 1,200 EDUs on the City's sewer system. The current plant is rated for 2,000 EDUs based on the permitted ADWF flow of .5 MGD. The current system can handle approximately 390 connections before reaching plant capacity (800 connections were available—300 units are committed to the Valley Ranch subdivision, 110 are committed to new development, leaving 390 available connections).

The treatment system consists of headworks, with grit removal, four aerated waste stabilization ponds and chlorination/dechlorination for reducing the number of pathogens. Sludge is removed from the ponds, dewatered and disposed of off-site. The pond system produces an equivalent secondary effluent. The City treats its wastewater using aerated ponds and disposes of the treated wastewater, (effluent), by discharging it to Salt Creek, a seasonal stream and tributary to Freshwater Creek and the Colusa Basin Drain.

The City's wastewater collection system consists of approximately 55,000 linear feet of 6-inch to 20-inch diameter pipeline. The general flow of wastewater is from south to north. There are currently two sewer lift stations. The collection system does not experience overflows during peak wet weather flows and is considered to have adequate capacity. Due to the flat terrain in the City, additional lift stations will be necessary depending on the location of new growth (LAFCO, 2007).

3.1.3 SOLID WASTE

There are four types of solid waste generated in Colusa County: residential waste, commercial waste, industrial waste, and natural resource byproducts. Most of the waste brought to landfills is residential waste. Natural resource byproducts include rice stubble and straw, manures, gas well muds, cannery waste, and waste from prune dehydrators. Rice stubble and straw is usually burned or disked into the land, while manures are often used as fertilizer.

KEY TERMS

Transfer station: A facility for the temporary deposition of some wastes. Transfer stations are often used as places where local waste collection vehicles will deposit their waste cargo prior to loading into larger vehicles. These larger vehicles will transport the waste to the end point of disposal or treatment.

Class I landfill: A landfill that accepts for disposal 20 tons or more of municipal solid waste daily (based on an annual average); or one that does not qualify as a Class II or Class III municipal solid waste landfill.

Class II landfill: A landfill that (1) accepts less than 20 tons daily of municipal solid waste (based on an annual average); (2) is located on a site where there is no evidence of groundwater pollution caused or contributed by the landfill; (3) is not connected by road to a Class I municipal solid waste landfill, or, if connected by road, is located more than 50 miles from a Class I municipal solid waste landfill; and (4) serves a community that experiences (for at least three months each year) an interruption in access to surface transportation, preventing access to a Class I landfill, or a community with no practicable waste management alternative.

Class III landfill: A landfill that is not connected by road to a Class I landfill or a landfill that is located at least 50 miles from a Class I landfill. Class III landfills can accept no more than an average of one ton daily of ash from incinerated municipal solid waste or less than five tons daily of municipal solid waste.

REGULATORY FRAMEWORK

FEDERAL

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide. After several amendments, the Act as it stands today governs the management of solid and hazardous waste and underground storage tanks (USTs). RCRA, enacted in 1976, is an amendment to the Solid Waste Disposal Act of 1965. RCRA has been

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amended several times, most significantly by the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA is a combination of the first solid waste statutes and all subsequent amendments. RCRA authorizes the Environmental Protection Agency (EPA) to regulate waste management activities. RCRA authorizes states to develop and enforce their own waste management programs, in lieu of the federal program, if a state's waste management program is substantially equivalent to, consistent with, and no less stringent than the federal program.

STATE

California Integrated Waste Management Act

The California Integrated Waste Management Act of 1989 (AB 939) requires every city and county in the State to prepare a Source Reduction and Recycling Element to its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory State waste diversion goals of 25 percent by 1995 and 50 percent by 2000. The purpose of AB 939 is to “reduce, recycle, and re-use solid waste generated in the State to the maximum extent feasible.” The term “integrated waste management” refers to the use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment. The Act has established a waste management hierarchy, as follows: Source Reduction; Recycling; Composting; Transformation; and Disposal. Norcal Waste Systems of Butte County, Inc. provides for source reduction through the collection of greenwaste and recycling as part of the waste disposal program, which is available in many areas of Colusa County.

California Integrated Waste Management Board Model Ordinance

Subsequent to the Integrated Waste Management Act, additional legislation was passed to assist local jurisdictions in accomplishing the goals of AB 939. The California Solid Waste Re-use and Recycling Access Act of 1991 (§42900-42911 of the Public Resources Code) directs the California Integrated Waste Management Board (CIWMB) to draft a “model ordinance” relating to adequate areas for collecting and loading recyclable materials in development projects. The model ordinance requires that any new development project, for which an application is submitted on or after September 1, 1994, include “adequate, accessible, and convenient areas for collecting and loading recyclable materials.” For subdivisions of single family detached homes, recycling areas are required to serve only the needs of the homes within that subdivision.

LOCAL

Colusa County Code, Chapter 32: Solid Waste Management

As part of the state of California program for solid waste management and resource recovery and for the preservation of health, safety, and well being of the public, the County has determined that it is in the public interest that the County make provisions for solid waste handling services. Solid waste materials are primarily created by people who are residents of the county and not by any particular business, industries, commercial enterprises, agricultural pursuits or land uses. It is found by the board of supervisors that there is a direct relationship between the volume of solid wastes generated within the county and the number of families permanently residing in the county. It is further found that the cost and expense of acquiring, opening and maintaining solid waste disposal sites in Colusa County, in a manner compatible with good public health and environmental practices, should be borne directly by those who create the waste disposal problem. Therefore, for the purpose of solid waste disposal, all lands within the unincorporated area of the county are classified according to those parcels upon which

dwelling units are situated and those parcels upon which dwelling units are not situated, without regard to other land use, zoning, assessed valuation or other criteria.

Chapter 32 of the Colusa County Code contains specific requirements related to:

- Pre-collection and storage of solid waste
- Waste removal time periods
- Waste ownership and responsibilities
- Waste collection
- Transfer station services
- Waste disposal, and
- Solid waste handling

EXISTING FACILITIES

Residential and commercial garbage pickup is provided by Recology Butte Colusa Counties, formerly Norcal Waste Systems of Butte County. Service is provided to the cities of Colusa and Williams, as well as the unincorporated communities of Arbuckle, Maxwell, and Princeton (Recology, 2009). Garbage picked up from areas east of the Tehama-Colusa Canal are taken to the Maxwell Transfer Station, while garbage picked up from areas west of the Tehama-Colusa Canal is taken directly to the Stonyford Disposal Site (Azevedo, 2009).

Maxwell Transfer Station

The Maxwell Transfer Station is located on SR 99 south of the community of Maxwell. It is a solid waste transfer station which receives up to 100 tons per day of mixed municipal and construction/demolition refuse. The facility has applied for a modified permit which would allow up to 180 tons daily (Azevedo, 2009). Garbage is brought to the transfer station by Recology's trucks, but the facility is also open to the public (Azevedo, 2009). The transfer facility handles e-waste and used oil, but cannot accept hazardous waste (Azevedo, 2009). There is currently no program in Colusa County to handle hazardous waste (Azevedo, 2009). The facility is owned and operated by Recology Butte Colusa Counties.

Stonyford Disposal Site

The County of Colusa owns and operates the Stonyford Disposal Site, located on Lodoga-Stonyford Road, south of the community of Stonyford. It is a Class III landfill with a maximum permitted capacity of 149,219 cubic yards. As of April 30, 2001, the Stonyford Disposal Site had a remaining capacity of 55,683 cubic yards. This site receives agricultural waste, construction and demolition waste, mixed municipal waste, and tires (CIWMB, 2009).

3.1.4 ELECTRICITY AND NATURAL GAS

REGULATORY FRAMEWORK

STATE

Public Utilities Commission

The California Public Utilities Commission (PUC) is the primary State agency that regulates private utilities. These utilities include telecommunications, electricity, natural gas, water, railroad, rail transit, and passenger transportation companies. A primary role of the PUC is to authorize utility rate changes. It also establishes service standards and safety rules, monitors the safety of utility and transportation operations, prosecutes unlawful marketing and billing activities, and oversees the merger and restructure of utility corporations.

Bioenergy Action Plan – Executive Order #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity, including biomass cogeneration facilities.

Senate Bill 14 and Assembly Bill 64

Prior to the passage of SB 14 and AB 64 in 2009, California law required investor-owned utilities (IOUs) and energy service providers (ESPs) to increase their existing purchases of renewable energy by 1% of sales per year such that 20% of their retail sales, as measured by usage, are procured from eligible renewable resources (including biomass cogeneration) by December 31, 2010. This is known as the Renewable Portfolio Standard (RPS).

SB 14 and AB 64 require IOUs, POUs, and ESPs to increase their purchases of renewable energy such that at least 33% of retail sales are procured from renewable energy resources by December 31, 2020. For IOUs and ESPs, this is required only if the CPUC determines that achieving these targets will result in just and reasonable rates.

EXISTING SETTING

The Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to residences and businesses throughout Colusa County. As a private utility, PG&E has a service area that covers most of northern and central California. PG&E generates electric power from many sources, including hydroelectric powerhouses, a nuclear power plant (Diablo Canyon) and a few small fossil-fired power plants. PG&E also purchases power from independent power producers; generation sources from these producers can range from large fossil power plants to smaller renewable and cogeneration plants. After the power is produced or bought, it goes into PG&E's electric transmission and distribution systems to get to the homes and businesses of PG&E's customers.

Infrastructure to deliver electricity and natural gas is currently in place. PG&E generally can provide these services to newer development on request. However, some residences in the County, particularly in the more rural areas, may also heat their residences using propane, generally stored in individual tanks and delivered by propane companies.

PG&E Colusa Generating Station

The Colusa Generating Station site is located on a 31 acres approximately six miles north of the community of Maxwell, 14 miles north of the community of Williams and four miles west of I-5. The site is accessed by Dirks Road, currently providing access to the PG&E gas compressor station that is located to the west. The Colusa Generating Station is a combined cycle power plant producing a nominal 660 megawatts of electricity, with two natural gas-fired turbine generators using two heat recovery steam-generators, providing steam for one steam turbine generator. Linear facilities include four double-circuit 230-KV transmission lines looping to the power plant's new substation and PG&E's existing transmission lines located approximately 1,800 feet to the west, 1,500 feet of 8-inch natural gas pipeline, 2,700 feet of 4-inch water pipeline constructed from the Tehama-Colusa Canal west of the project site. Construction on the project began in November, 2008.

3.2 PUBLIC SAFETY SERVICES

3.2.1 FIRE PROTECTION

REGULATORY FRAMEWORK

STATE

California Occupational Safety and Health Administration

In accordance with California Code of Regulations Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment" the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all fire fighting and emergency medical equipment.

Office of Emergency ServicesThe State of California passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

LOCAL

County Emergency Response/Evacuation Plans

The County of Colusa is responsible for emergency response and evacuation plans within the unincorporated areas of the county. The Colusa County Sheriff's Department operates the County Office of Emergency Services.

EXISTING FACILITIES

Fire protection in Colusa County is provided by six rural fire districts, one city fire department, one joint powers authority, the California Department of Forestry (CDF), and the U.S. Forest Service. The majority of districts are staffed by volunteer firefighters. There are mutual aid agreements between most of the agencies to ensure adequate staff and equipment are available when a fire occurs.

The incidence of fire in the county is relatively low, particularly on the valley floor. The greatest hazards are in the forest area, which generally fall under the jurisdiction of state and federal agencies. The greatest threat of fire occurs annually during the months from June through October due to dry

3. COMMUNITY SERVICES AND FACILITIES

conditions and summer heat. Each summer, the CDF and U.S. Forest Service increase their staff in anticipation of brush and forest fires.

The rural fire protection districts are responsible for structural and wildfire protection as well as medical emergencies within their respective districts. Response times can range from one minute in the cities of Williams and Colusa to more than 20 minutes in the rugged mountain areas.

Each fire protection district earns a rating calculated by the Insurance Service Office (ISO). This rating, known as a Public Protection Classification (PPC), is utilized by many insurance providers to calculate insurance premiums within the district. Ratings range from 1 to 10. Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire-suppression program does not meet ISO's minimum criteria.

The PPC ratings are calculated on the following factors:

- Fire alarm and communication systems, including telephone systems, telephone lines, staffing, and dispatching systems;
- The fire department, including equipment, staffing, training, and geographic distribution of fire companies; and,
- The water-supply system, including the condition and maintenance of hydrants, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires.

Ratings in Colusa County range from 4 to 9. The lower ratings generally occur in areas that are not served by a public water system, areas with insufficient equipment, or areas with inadequate water flow capacity.

DISTRICT PROFILES

Arbuckle/College City Fire Protection District. The District encompasses 123 square miles in the south central part of Colusa County. The fire station is located at 506 Lucas Street in Arbuckle. Staff includes one paid chief, two paid fire fighters, one part-time administrative assistant, and 25 volunteer firefighters. The station includes one command vehicle, one rescue vehicle, one utility/support vehicle, three Type 1 vehicles, two Type 2 vehicles, and a water tender. The ISO rating for the District is 5 within the urban area and 8 in the outlying rural areas. This station receives approximately 600 calls per year, with nearly 70 percent of those calls for emergency medical services.

Bear Valley/Indian Valley Fire Protection District. The District encompasses about 60 square miles in the Bear Valley and Indian Valley areas of Colusa County and also extends about seven miles north into Glenn County. The District's primary role is to provide support in the event of structural fires, but the District also provides occasional support to the CDF in fighting grass or range fires. The District also provides emergency medical services to the communities of Stonyford and Lodoga. The station is located on Market Street in Stonyford.

Sacramento River Fire Protection District. The Sacramento River Fire District (SRFD) provides fire protection, emergency medical services, rescue, and hazardous materials response services to the eastern portion of unincorporated Colusa County, including the community of Grimes. SRFD's 207 square-mile service area runs along the Sacramento River from two miles south of Princeton to the Colusa/Yolo County line. The SRFD serves the service area from its fire station at 235 Market Street in

the City of Colusa. The SRFD is staffed by one full time fire chief and 44 volunteers. One firefighter is usually on duty during daytime hours Monday through Friday, with support of volunteer firefighters. Nighttime and weekend staffing is provided by a duty officer and the volunteers. According to the SRFD, the Fire District's equipment is adequate for current demand. The SRFD maintains a mutual aid agreement with all fire agencies within Colusa County, Meridian Fire Department in Sutter County, Sutter County Fire Department, Glenn-Colusa Fire District in Glenn County, and Dunnigan and Knights Landing Fire Districts in Yolo County.

During the period between July 1, 2005 and June 30, 2006, SRFD responded to 75 fires, 184 medical emergencies, 42 fire investigations, 31 mutual aid and automatic aid responses, 17 false alarms, one hazardous materials call, and three rescues. During this period SRFD requested mutual aid 23 times mostly from Meridian Fire District and Colusa City Fire Department.

City of Colusa Fire Department. The City of Colusa Fire Department provides fire protection and emergency services within the city limits from its fire station located at 750 Market Street. The station currently needs repairs and renovation and is operating at capacity. The Fire Department maintains a staff of five paid and 26 volunteer firefighters. The Department maintains a mutual aid agreement with six other fire agencies within Colusa County (City of Colusa 2007b). The Department also maintains a mutual aid agreement with the Colusa Casino for fire protection services.

Glenn-Colusa Fire Protection District. The District provides services to a small sparsely populated area between the Sacramento River and Butte Creek. The majority of the service area is in Glenn County. The fire station is located in Butte City, about four miles into Glenn County from the border with Colusa County. Development in this area is limited by flood hazards, poor access, and a lack of urban services.

Maxwell Fire Protection District. The District encompasses 130 square miles in the north central part of Colusa County. The fire station is located at 231 West Oak Street in Maxwell. The District includes three paid firefighters and 27 volunteers. District equipment includes two Type 1 vehicles, a Type 1 ladder truck, one Type 3 vehicle, one 3,000 gallon water tanker, a rescue/medical unit, and a light utility vehicle. The District's ISO rating is 5 in town and 8B out of town. The majority of the calls received by this station are for medical emergencies. The next highest percentage of calls is for grass fires.

Princeton Fire Protection District. The District covers the northeastern portion of Colusa County surrounding and including the community of Princeton. The station is located at 342 Winter Street in Princeton. The District is staffed completely by volunteers and handles very few calls.

Williams Fire Protection Authority. This agency is a joint powers authority (JPA) between the Williams Rural Fire Protection District and the City of Williams Fire Department. The fire station is located at 810 E Street in Williams. Staff includes one paid fire chief, four paid shift personnel, one part-time paid administrative assistant, and 39 volunteer firefighters. This agency has two command vehicles, two water tenders, one rescue vehicle, one brush/quick attack vehicle, one aerial ladder truck, and three engines. The ISO rating is 4 within the City of Williams and 6 outside the city limits, but within five miles of the station. The distribution of calls has been consistent, with approximately 50 percent of calls for medical services and 33 percent for fires.

STATE/FEDERAL RESPONSIBILITY AREAS

Wildfire protection in the non-federally owned upland areas, or State Responsibility Areas (SRAs), is the responsibility of the CDF. The CDF has jurisdiction over approximately 459 square miles of Colusa County. The CDF operates a fire station at Leesville (2959 Bear Valley Road, Williams), which is generally

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manned between June 15 and November 1. This CDF unit also assists with emergency medical services and structural fire response in western Colusa County.

Wildfire protection within the Mendocino National Forest is provided by the U.S. Forest Service, who works closely with CDF and the Bear Valley/Indian Valley Fire District. The U.S. Forest Service operates one fire station at 310 Quail Street in Stonyford. The station is generally staffed between June and October. The U.S. Forest Service also maintains an unmanned lookout tower on Goat Mountain, on the western border of Colusa County adjacent to Lake County.

3.2.2 LAW ENFORCEMENT

REGULATORY FRAMEWORK

Emergency Response/Evacuation Plans

The State of California passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

The County of Colusa is responsible for emergency response and evacuation plans within the unincorporated areas of the county. The Colusa County Sheriff's Department operates the County Office of Emergency Services.

LAW ENFORCEMENT SERVICES

The unincorporated areas of Colusa County receive general public safety and law enforcement services from the Colusa County Sheriff's Department. The Sheriff's Department also operates the Office of the Coroner and the County Office of Emergency Services (OES). The Sheriff's Department is responsible for all law enforcement patrol services throughout all areas of the unincorporated County.

The municipal police departments serve the cities of Colusa and Williams. Both cities use the county jail for all detentions. Since many law enforcement matters cross jurisdictional lines, the municipal police forces work closely with the Colusa County Sheriff's Department. The Sheriff's Department also provides 24-hour dispatching services for the municipal police departments. The County Sheriff's Department and the police forces of the cities of Colusa and Williams often work in concert for search and rescue efforts.

The U.S. Forest Service District Ranger provides law enforcement services within the Mendocino National Forest. The Fish and Game Warden patrols the National Wildlife Refuges. The California Highway Patrol patrols state roads and maintains an office at 100 E Street in Williams.

Colusa County Sheriff's Department

FACILITIES

In 1962, a new Sheriff's Office and Jail was constructed at its current location on Bridge Street in the City of Colusa. During the past 20 years, renovations have been completed three times in order to keep up with changing times. The current facility is a 26,000 square foot concrete building that employs 75 staff members and has 93 volunteer members. It is a maximum security jail facility that can house 92 prisoners.

SHERIFF'S SERVICES

The **Investigations Unit** is made up of plain-clothes detectives and a detective supervisor. The detectives are responsible for following up on all reported crimes not routinely handled by a patrol deputy. These crimes may include property crimes, sex crimes, crimes against children, homicides and financial crimes. The detectives are often called to a crime scene to photograph, fingerprint, collect evidence, and interview victims, witnesses, and suspects.

The **Colusa County Volunteer Citizen Service Unit (V.C.S.U.)** is made up of citizens 18 or older and was established to aid all Colusa County Law Enforcement Agencies by providing non-enforcement services and activities. Volunteers may work in office or clerical positions, volunteer patrol, crime prevention, or any non-enforcement function requested by the involved agencies and approved by the advisory board.

The Volunteer Citizen Service Unit is a non-profit corporation. It has its own Board of Directors. The Board of Directors serve under an Advisory Board comprised of the Colusa County Sheriff, Chief of the Colusa Police Department, and Chief of the Williams Police Department. Liaison between the Advisory Board and the volunteers is maintained through the Sheriff's Office Crime Prevention Coordinator.

The Colusa County Sheriff has the responsibility and authority for all search and rescue activities within the boundaries of Colusa County. To help provide these services a rescue team was formed in 1984. The team is composed of dedicated, trained, civilian volunteers.

The **Search and Rescue Team (SAR)** has been involved in various missions from searching for lost children, motorcyclists, and hunters to rescuing victims of plane crashes. SAR is also used for evidence searches in major crimes. The SAR Team operates an "Aid Station" to assist outdoor enthusiasts on major holiday weekends.

The **Civil Unit** fulfills the Sheriff's ministerial duties to the court. The Sheriff is tasked by the California Government Code to serve all proceedings presented to him and to enforce court judgments in his capacity as levying officer. The Colusa County Sheriff's Office Civil Unit serves court process. Fees are set by the Government Code. Sworn Deputies assigned to the Civil Unit are trained to handle the many different types of court civil process as well as domestic violence restraining orders and family law orders. Although the Civil Unit may not give legal advice, information on certain specific procedures and the status of current civil process is available by telephone.

The **Communications Center** is comprised of dispatchers who are trained to handle a variety of duties and responsibilities in the County 911 Communications Center. Dispatchers participate in a variety of duties and responsibilities involving 911 calls covering law enforcement, fire and medical services. These duties include receiving incoming police, fire, medical and emergency assistance calls and to dispatch any necessary units; to perform a variety of general support duties related to dispatcher activities including jail detention duties, jail control panel, record keeping, data entry and filing.

Dispatchers have knowledge of the technique, procedures, and methods used in the operation of a public safety communications center. The functions and responsibility of Sheriff's Office and other user agencies; general office and record keeping procedures; FCC rules and regulations relative to the operating of two-way communications equipment; jurisdictions and locations of streets, roads, and highways within the county; computer and the kind of information obtainable from criminal data banks.

The **Records Unit** maintains files on offenders required to register with the Department of Justice. This division maintains local data and a file containing personal information, fingerprints and photographs on Sex Offenders (290 PC), 11590 H&S/Drug Registrants, and 457.1 PC/Arson Registrants. Registration

3. COMMUNITY SERVICES AND FACILITIES

information on Arson and Sex Offenders is forwarded to the Department of Justice for entry into the automated statewide computer system "California Law Enforcement Telecommunications System". Sex Offenders (290 PC) files are also entered into the "Megan's Law" CD ROM file.

Live Scan applicant fingerprinting is done daily during business hours. Live Scan devices electronically capture fingerprint images which are electronically transmitted to the Department of Justice. This process eliminates the use of ink in fingerprinting.

Local crime data on major crimes is compiled and reported to the State on a monthly basis. Colusa County crime data is reported on Uniform Crime Reporting forms. This data is then forwarded to the national UCR (Uniform Crime Reporting) Program that compiles the information. UCR on a federal level is administered by the Federal Bureau of Investigation.

In addition to the above, the Records Unit is responsible for processing all crime reports and citations. Report copies are then routed to the required agencies, i.e., District Attorney, Victim Witness Advocacy, Probation Department, Child Protective Services, Crime Prevention, Insurance Companies, and victims. Other duties include processing initial and renewal gun permits. Live scan fingerprints are used to expedite the fingerprint for initial gun permit applications.

The **Colusa County Office of Emergency Services (OES)**, a division of the Colusa County Sheriff's Office, is the emergency management agency for Colusa County, and as such is the lead agency that fulfills the county's requirements under the Emergency Services Act (Government Code Section 8550 et. seq.). This office works with partners in the emergency management programs of the Cities of Colusa and Williams as well as the Colusa Regional Medical Center. OES also works with the various special districts, authorities, and joint powers authorities within the boundaries of Colusa County.

The primary mission for OES is to coordinate the county government's role in response to disaster or other large scale emergency. The four aspects of emergency management are:

- **Preparation:** Training, drills and exercises, plan development, and other such activities are part of the preparation before the disaster happens. OES works with county staff, allied agencies, neighboring jurisdictions, and state agencies with a local role to ensure the necessary procedures and networks are in place.
- **Response:** This office responds to a disaster (or potential disaster) in the unincorporated area of Colusa County, to support another political jurisdiction within the boundaries of Colusa County deal with a disaster in their territory, or both. Personnel from the various departments and allied agencies that have participated in the training respond to the Emergency Operations Center (EOC), where the County's effort is coordinated. The EOC does the following:
 - Manage the County's overall response to natural and man-made disasters.
 - Task various County Departments with emergency responsibilities (some pre-identified, some generated as the disaster requires).
 - Coordinate the response and recovery efforts of governmental and allied non-governmental agencies.
- **Recovery:** When the threat has been removed, it is time to move back to normal or at least as close to normal as possible. This involves ensuring the functions of county government are back in place as quickly as possible. OES is unable to provide direct disaster assistance, including

financial assistance, to the residents of Colusa County. However, this office is a primary conduit for information, including information about the agencies that can directly help.

Crimes by Category in Colusa County

Statistics on the number of crimes by category of crime in Colusa County from 2003 through 2008, as reported by the California Department of Justice, are shown in Table 3.2.2 below.

	2003	2004	2005	2006	2007	2008
Violent Crimes	61	59	51	80	66	42
Homicide	0	0	0	0	1	1
Forcible Rape	10	2	7	10	4	3
Robbery	6	5	4	7	7	8
Agg. Assault	45	52	40	63	54	30
Property Crimes	380	352	353	363	352	310
Burglary	191	207	186	164	194	163
Vehicle Theft	70	55	62	78	55	34
Larceny-Theft over \$400	119	90	105	121	103	113
Total Larceny-Theft	371	314	320	382	353	293
Over \$400	119	90	105	121	103	113
\$400 and Under	252	224	215	261	250	180
Arson	2	7	2	7	1	6

As shown in the table, the majority of crimes committed in Colusa County consist of non-violent property crimes, primarily burglary. Between 2003 and 2008 there were only two murders reported in Colusa County.

3.3 SCHOOLS

REGULATORY FRAMEWORK

STATE

Leroy F. Greene School Facilities Act of 1998 (SB 50)

The "Leroy F. Greene School Facilities Act of 1998," also known as Senate Bill No. 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district's authority to levy school impact fees. This comprehensive legislation, together with the \$9.2 billion education bond act approved by the voters in November 1998 known as "Proposition 1A", reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for state construction and modernization funds. It imposed limitations on the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

- Level I fees are the current statutory fees allowed under Education Code 17620. This code section provides the basic authority for school districts to levy a fee against residential and commercial construction for the purpose of funding school construction or reconstruction of

3. COMMUNITY SERVICES AND FACILITIES

facilities. These fees vary by district for residential construction and commercial construction and are increased biannually.

- Level II fees are outlined in Government Code Section 65995.5, allowing school districts to impose a higher fee on residential construction if certain conditions are met. These conditions include having a substantial percentage of students on multi-track year-round scheduling, having an assumed debt equal to 15–30 percent of the district’s bonding capacity (percentage is based on revenue sources for repayment), having at least 20 percent of the district’s teaching stations housed in relocatable classrooms, and having placed a local bond on the ballot in the past four years which received at least 50 percent plus one of the votes cast. A Facility Needs Assessment must demonstrate the need for new school facilities for unhoused pupils is attributable to projected enrollment growth from the construction of new residential units over the next five years.
- Level III fees are outlined in Government Code Section 655995.7. If State funding becomes unavailable, this code section authorizes a school district that has been approved to collect Level II fees to collect a higher fee on residential construction. This fee is equal to twice the amount of Level II fees. However, if a district eventually receives State funding, this excess fee may be reimbursed to the developers or subtracted from the amount of state funding.

The Kindergarten-University Public Education Facilities Bond Act of 2002 (Prop 47)

This act was approved by California voters in November 2002 and provides for a bond issue of \$13.05 billion to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted at areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California Community Colleges, the California State University, and the University of California in order to provide adequate higher education facilities to accommodate growing student enrollment.

California Department of Education

The California Department of Education (CDE) School Facilities Planning Division (SFPD) prepared a School Site Selection and Approval Guide that provides criteria for locating appropriate school sites in the State of California. School site and size recommendations were changed by the CDE in 2000 to reflect various changes in educational conditions, such as lowering of class sizes and use of advanced technology. The expanded use of school buildings and grounds for community and agency joint use and concern for the safety of the students and staff members also influenced the modification of the CDE recommendations.

Specific recommendations for school size are provided in the School Site Analysis and Development Guide. This document suggests a ratio of 1:2 between buildings and land. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

Certain health and safety requirements for school site selection are governed by state regulations and the policies of the SFPD relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;

3. COMMUNITY SERVICES AND FACILITIES

- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;
- Results of geological studies or soil analyses;
- Traffic and school bus safety issues.

EXISTING FACILITIES

Colusa County is served by six school districts: Colusa Unified School District, Maxwell Unified School District, Pierce Joint Unified School District, Princeton Joint Unified School District, Stony Creek Joint Unified School District, and Williams Unified School District. The Colusa County Office of Education assists the Colusa, Maxwell, Pierce, and Williams School Districts by providing a variety of services, including fiscal management, curriculum coordination, special schools and programs, health services, media programs and materials, and coordination of state and federal projects (CCOE Public School Directory). The Stony Creek and Princeton School Districts include areas of Glenn County and, as such, are supported by the Glenn County Office of Education.

Colusa County does not have any colleges or universities. The nearest community colleges are Butte Community College in Oroville and Yuba Community College, which has campuses in Marysville, Woodland, and Clearlake.

The schools located in Colusa County are listed in Table 3.3.3 below.

Table 3.3.3: Schools and Student Enrollment in Colusa County					
	Student Enrollment				
	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Colusa Unified School District					
Burchfield Elementary School (K – 3 rd)	436	424	439	443	467
- 400 Fremont Street, Colusa					
Egling Middle School (4 th – 8 th)	532	532	511	482	473
- 813 Webster Street, Colusa					
Colusa High School (9 th – 12 th)	390	383	333	336	343
- 901 Colus Ave., Colusa					
Colusa Alternative Continuation High School (9 th – 12 th)	33	34	32	29	26
- 817 Colus Ave., Colusa					
Colusa Alternative Home School (K – 12 th)	51	55	55	64	85
- 745 10th Street, Colusa					
Total District Enrollment:	1442	1428	1370	1354	1394
Maxwell Unified School District					
Enid Prine Continuation High School (9 th – 12 th)	10	9	10	10	9
- 514 West Oak Street, Maxwell					
Maxwell Elementary School (K – 8 th)	319	303	315	289	270
- 146 North Street, Maxwell					
Maxwell High School (9 th – 12 th)	126	130	148	160	143
- 515 Oak Street, Maxwell					

3. COMMUNITY SERVICES AND FACILITIES

Table 3.3.3: Schools and Student Enrollment in Colusa County

	Student Enrollment				
	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Total District Enrollment:	455	442	473	459	422
Pierce Joint Unified School District					
Arbuckle Alternative High School (10 th – 12 th)	14	16	20	18	15
- 966 Wildwood Road, Arbuckle					
Arbuckle Elementary School (K – 5 th)	519	544	563	588	562
- 701 Hall Street, Arbuckle					
Grand Island Elementary School (K – 6 th)	84	79	86	83	77
- 551 Leven Street, Grimes					
Lloyd G. Johnson Junior High School (6 th – 8 th)	285	281	309	266	272
- 938 Wildwood Road, Arbuckle					
Pierce High School (9 th – 12 th)	377	369	381	391	370
- 960 Wildwood Road, Arbuckle					
Total District Enrollment:	1279	1289	1359	1346	1296
William Unified School District					
Mid Valley Continuation High School (9 th – 12 th)	16	15	19	17	22
- 1105 D Street, Williams					
Williams High School (9 th – 12 th)	288	300	322	314	354
- 222 11th Street, Williams					
Williams Middle School (4 th – 8 th)	451	458	460	457	
- 300 11th Street, Williams					
Williams Primary Elementary School (K – 3 rd)	378	430	424	405	384
- 1404 E Street, Williams					
Williams Junior High School (7 th – 8 th)					168
- 260 11th Street, Williams					
Williams Upper Elementary School (4 th – 6 th)					290
- 300 11th Street, Williams					
Total District Enrollment:	1133	1203	1225	1193	1218
Stony Creek Unified School District					
Indian Valley Elementary School (5 th – 6 th)	20	19	15	15	15
- 5180 Logada-Stonyford Road, Stonyford					
Total District Enrollment:	20	19	15	15	15
Princeton Joint Unified School District					
Princeton Elementary School (K – 6 th)	102	90	92	107	112
- 428 Norman Road, Princeton					
Princeton Elementary Community School	2	5	3	3	2
Princeton High Community Day School	3	3	3	5	4
Princeton Junior/Senior High School (7 th – 8 th and 9 th – 12 th)	82	89	95	109	118
- 474 State, Princeton					
Total District Enrollment:	189	187	193	224	236

Table 3.3.3: Schools and Student Enrollment in Colusa County

	Student Enrollment				
	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
County School Enrollment totals:	4518	4568	4635	4591	4581

SOURCE: CALIFORNIA DEPARTMENT OF EDUCATION, 2009.

3.4 PARKS AND RECREATION

KEY TERMS

Community park: A park designed to serve several neighborhoods, or approximately 2,000 to 5,000 residents. Community parks may include areas suited for intense recreational facilities, such as athletic complexes and swimming pools. Such parks may also include opportunities for outdoor recreation, such as walking, viewing, picnicking, or sitting.

Mini-park: A small park (0.25 to 0.5 acres) designed to serve a concentrated population. Mini-parks may be targeted at serving specific groups, such as tots or senior citizens.

Neighborhood park/playground: A park designed for intense recreational activity to serve approximately 500 to 1,000 residents. Neighborhood facilities may include baseball fields, basketball courts, playground equipment, and skating facilities. These parks may also include natural areas for picnicking, viewing, or walking.

REGULATORY FRAMEWORK

FEDERAL

National Wildlife Refuges

Management of each National Wildlife Refuge is guided by the purpose of the individual refuge and the mission and goals of the Refuge System that includes the individual refuge, as well as U.S. Fish and Wildlife Service policy, laws, and international treaties. The National Wildlife Refuge System Administration Act of 1966, as amended by the Improvement Act, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations provide the federal laws for establishment and management of the refuges.

The Colusa, Delevan, and Sacramento National Wildlife Refuges are all part of the Sacramento National Wildlife Refuge Complex and are all guided by a single Comprehensive Conservation Plan (CCP). The Sacramento, Delevan, Sutter, and Colusa National Wildlife Refuges Final CCP guide the management of the Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges. The U.S. Fish and Wildlife Service manages the refuges as part of the Sacramento National Wildlife Refuge Complex.

Mendocino National Forest

The Mendocino National Forest Land and Resource Management Plan (LRMP) provides the framework to guide the ongoing land and resource management operations of the Mendocino National Forest. The LRMP's goal is to provide a management program reflecting a mix of activities for the use and protection of the Forest. The LRMP:

- Establishes the management direction and associated long-range goals and objectives for the Forest,

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- Specifies the standards, approximate timing, and vicinity of the practices necessary to implement that direction, and
- Establishes the monitoring and evaluation requirements needed to ensure that the direction is being carried out, and to determine if outputs and effects have been reasonably estimated.

The LRMP is a strategic document that provides guidance for but does not make project level decisions. Those decisions are made after more detailed, site-specific environmental analysis and further public comment. The National Forest Management Act (NFMA) requires that resource plans and permits, contracts, and other instruments issued for the use and occupancy of National Forest System lands be consistent with the forest plan. The following are some examples of project decisions that require more detailed environmental analysis:

- Timber harvesting and related activities, such as slash disposal and road construction,
- Range allotment management plans,
- Fish or wildlife habitat improvement projects,
- Watershed improvement projects, and
- Developed recreation sites or trail construction.

The LRMP focuses primarily on management prescriptions for habitat, wilderness, and recreation uses. The LRMP anticipates a steady workforce and does not foresee the need for extensive construction of new facilities for administrative activities and to house the workforce, but rather anticipates that existing facilities will need to be maintained and improved.

The LRMP does not provide much direction regarding private development within the Mendocino National Forest. However, the U.S. Forest Service provides for special use permits for private activities. Special use permits may be requested from the U.S. Forest Service for a variety of land uses in national forests, including water transmission, agriculture, timber production, outfitting and guiding, recreation, telecommunication, research, photography and video productions, and granting road and utility rights-of-ways.

Recreation residences are also a federally permitted use in national forests. In 1968, a moratorium was placed on establishing additional residential tracts within forests and the moratorium was expanded in 1976 to also prohibit development of new lots within existing tracts. Existing recreation residences within a national forest are required to obtain a special use permit, which has a maximum term of 20 years. However, there is no guarantee that a new special use permit will be issued at the end of the permit term.

STATE

Quimby Act

The Quimby Act (California Government Code Section 66477) states that “the legislative body of a city or county may, by ordinance, require the dedication of land or impose a requirement of the payment of fees in lieu thereof, or a combination of both, for park or recreational purposes as a condition to the approval of a tentative or parcel map.” Requirements of the Quimby Act apply only to the acquisition of new parkland and do not apply to the physical development of new park facilities or associated

operations and maintenance costs. The Quimby Act seeks to preserve open space needed to develop parkland and recreational facilities; however, the actual development of parks and other recreational facilities is subject to discretionary approval and is evaluated on a case-by-case basis with new residential development. The County has not adopted park fees as allowed by the Quimby Act.

OUTDOOR RECREATION

Mendocino National Forest

The largest designated recreation area in Colusa County is the Mendocino National Forest, managed by the U.S. Forest Service. A variety of recreational opportunities exist within the forest: camping, hiking, backpacking, boating, fishing, nature study, photography, and off-highway vehicle travel. The Forest is a "working forest," so activities such as logging and grazing do occur. The U.S. Forest Service seeks to manage the variety of uses to ensure conservation of the forest resources.

Many of the developed recreation sites within the Mendocino National Forest were built 30-50 years ago. Since then, visitor preferences have changed and some facilities are in poor condition. In 2007, the U.S. Forest Service completed a 5-year analysis of recreational facilities and developed a list of proposed changes. These changes include fee increases for various facilities, removal of amenities, and replacement of existing amenities.

Letts Lake in Upper Letts Valley (within the Mendocino National Forest) is a popular recreation area. There are eight campgrounds around the lake, a few summer homes, and numerous trails. The lake is stocked with trout and bass, and boating is limited to non-motorized craft only.

Davis Flat, also located within the Mendocino National Forest, is a popular spot for off-highway vehicle (OHV) activity. The facilities at Davis Flat include a campground and special trails marked for various levels of driving skill. Organized OHV events require a special use permit which requires a bond to guarantee cleanup and trail maintenance following the event.

Sacramento River State Recreation Area (SRA)

The Sacramento River SRA provides 60 acres of riverfront recreation at the north end of the City of Colusa. The park features boat ramps, picnic facilities, trails, and camping. Fishing and boating are popular activities at this park. Though the Sacramento River SRA is the only public boat launch in the area of the Sacramento River around the City of Colusa, people enter the river at several private sites. Much of the land adjacent to the Sacramento River is privately owned agricultural land.

Boating is a popular activity on the Sacramento River. The boating season generally begins in April and continues until winter weather sets in. A cleared navigational channel is maintained between the City of Colusa and Sacramento. This channel allows boats up to 40 feet in length to travel between Colusa and Sacramento. There are several areas along the river for camping and houseboat rentals, most of which are outside of the County of Colusa. A river cruise from the mouth of the Sacramento River near Antioch to Colusa is approximately 145 miles and takes approximately 10-12 hours.

The river is generally not visible to motorists on SR 45, which parallels the river, due to an extensive system of levees along the river. There are segments of Butte Slough Road and River Road which are on top of the levees and offer views of the river. The only organized trail system along the banks of the river within Colusa County is connected to the Colusa-Sacramento River SRA.

3. COMMUNITY SERVICES AND FACILITIES

Fishing

Fishing is plentiful in the Sacramento River between Grimes and Princeton. Salmon, steelhead trout, and striped bass are the most common fish in this area. People fish both from boats and the banks of the Sacramento River. The Mendocino National Forest offers 85 miles of trout streams. Big Stony Creek and Little Stony Creek and their tributaries are the primary fishing areas. The streams are occasionally stocked with trout by the California Department of Fish and Game. Letts Lake, a 35-acre lake stocked with trout and bass, is another popular fishing spot.

Hunting

More ducks and geese winter in the Sacramento Valley than any other area of the Pacific Flyway. Numerous wildlife refuges help sustain the birds in Colusa County through the fall and winter by providing food and sanctuary. Ducks generally arrive in August, and geese generally arrive in late November. Public hunting is permitted in areas of the refuges during the appropriate season, but hunters must obtain a permit from one of the check stations.

In addition to providing habitat for ducks and geese, the refuges also attract swans, marsh and shore birds, upland birds, and small mammals. Nearly 200 species of birds have been recorded in the area, making Colusa County a popular location for bird watchers.

There are also a number of commercial hunting clubs and cooperatives operated by community organizations throughout Colusa County. Hunting camps are operated on private agricultural land by special use permit. Lambertsville has a large congregation of mobile homes and trailers used by hunters on a seasonal basis.

The Walker Ridge Public Hunting Area, located in the western foothills of Colusa County, is maintained by the Bureau of Land Management. This area is popular for hunting of quail and deer.

LOCAL RECREATION AREAS AND PARKS

City of Colusa

The City of Colusa Parks and Community Services Department is responsible for the operation of an aquatics complex, softball facility, and nine existing parks within the City of Colusa, as well as organizing various city-wide recreational activities that are offered on a year-around basis to city and county residents. The City of Colusa has an extensive network of local park facilities. The amenities at the City of Colusa parks include BBQ facilities, swimming pools, picnic tables, playgrounds, tot lots, trails, baseball fields, and basketball courts. The City of Colusa is also home to the Sacramento River SRA. The existing park and recreation facilities in the City of Colusa are listed in Table 3.4-1.

City of Williams

The City of Williams Parks and Recreation Department is responsible for the operation of all parks and recreation facilities within the City of Williams, as well as organizing various city-wide recreational activities that are offered on a year-around basis to city and county residents. The existing park and recreation facilities in the City of Williams are listed in Table 3.4-1.

Arbuckle Parks and Recreation

Arbuckle Parks and Recreation has been operating in the Arbuckle area solely from community donations and other government agencies. In the past several years Arbuckle Parks and Recreation in coordination with the Arbuckle Revitalization Committee has been creating some new community parks.

These joint efforts were formed out of the CEDS (Community Economic Development Strategy) Plan for Arbuckle. In 1999 the Plan was accepted, and action items outlined for the Parks and Recreation Committee. The beautification of Arbuckle and the creation of a downtown parks plan were the first action items undertaken by the Committee.

Since 1999 the two committees have created the “Wee Park,” a beautification project at the intersection of Old Hwy 99 and Hillgate Road. The “KIA Memorial Park” in downtown Arbuckle, a project that also recognized members of the Arbuckle and College City communities killed during a foreign war was also completed. Finally, the Committee is developing the “Lavanch Hursh Park”, this park is also a downtown park that will have picnic areas, a covered pergola for events in the park, and central location for community events. For the recreation portion of the plan the committee has created and implemented the “Swim Program,” at the Arbuckle Pool. Other programs offered include Adult Aerobics, a Tot Tumbling Class and Yoga, as well as a youth basketball league.

The existing park and recreation facilities in Arbuckle are listed in Table 3.4-1.

Maxwell Recreation and Parks District

The Maxwell Recreation and Parks District was formed to manage the town pool and provide for the recreation needs of the community. Recreation facilities within the community of Maxwell include the local pool, the rodeo grounds and recreational opportunities on facilities owned by the local school district, which include primarily sports fields and playground facilities.

Other Facilities

The foothill and upland areas are surrounded by an abundance of outdoor recreational areas, however there are no formal park facilities in most of these areas. . The community of Sites is served by a small park. Residents in Stonyford and Lodoga are served by the Stonyford Rodeo grounds and amenities at the East Park Reservoir. The East Park Reservoir includes camping and other recreational uses. Stonyford also has one park.

Private Recreational Facilities

There are two golf courses in Colusa County. The Arbuckle Golf Club is a 9-hole course located on Hillgate Road, west of Arbuckle. The Colusa Golf and Country Club is a 9-hole course located on SR 20, southeast of Colusa.

Wilbur Hot Springs is located in southwest Colusa County in an area known in the early 1900’s for containing many hot springs resorts. The naturally hot mineral waters flow through the baths in varying temperatures from 98° to 120°.

Table 3.4-1: Inventory of County Parks by Community

Community	Name/Location	Description
Colusa	Colusa Levee Scenic Park Located on 10th and Main St. adjacent to Sacramento River Recreation Area.	The park is placed on 2.19 acres and built upon the Sacramento River Levee. The park includes: grass, trees, paved walking, jogging or biking trail, picnic tables, a 20' x 20' concrete stage and BBQ Pits.
Colusa	Memorial Park Located on 10th and Market Sts.	This Park is placed on 2.35 acres with shady, tree-filled grassy areas with a children's play area that includes swings, a slide, rock-climbing wall, picnic tables and public restroom. Electricity available for public events.
Colusa	A.B. Davison Park	This park is situated on 1.02 with shady tree-filled grassy

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Table 3.4-1: Inventory of County Parks by Community

	Located on 10th St. between Webster and Parkhill.	areas with paved walking paths throughout.
Colusa	Municipal Swimming Pool Located on 9th St. between Webster and Parkhill.	The Municipal Swimming Pool includes One 8ft deep Pool, One 3ft. deep pool, and one wading pool. Open during the summer only.
Colusa	Will S. Green Park Located on 8th St. between Webster and Parkhill.	This park is located near the Municipal Swimming pool on 2.35 acres that includes barbeque facilities, picnic tables, horseshoe pit, children play area with swings, slide, jungle gym, and glider swings for tots. This is a great area for family activities.
Colusa	Sankey/Elmwood Park Located between Webster and Parkhill and 3rd and 4th Sts.	This 0.58 acre park includes a kindergarten playground with slide, swings, drinking fountain, picnic tables, BBQ pit, restrooms, lighted tennis courts, and volleyball area. Electricity available for public events.
Colusa	C.D. Semple Park Located on the corner of 3rd and Larson Larson Ln.	This 1.2 acre park is an open grass area that includes a children's play area, restrooms and covered in great shade trees and grassy areas with picnic tables and BBQ facilities.
Colusa	Lewis Tennant Ball Field Complex Located on Colus Ave. across from Colusa High School.	This 4.0 acre park is the site of the Colusa Softball Association games and tournaments. This park includes two softball fields, restrooms, concession stand, picnic tables, and 0.33 acres of tot lot play area scaled to toddlers with a sandy surface.
Colusa	King-Vale Park Located on 3rd St.	This 0.30 acre park is a large sandy area with children's tot lot with swings, slide, and merry go round.
Colusa	Leland L. Taylor Memorial Park Located on Country Club Dr.	The park is placed on an acre of open grass area for play, in addition to picnic tables.
Williams	North View Park Location: Northern end of Virginia Way	Amenities include children and toddler play structures, a full size basketball court, a soccer field, picnic tables and benches, drinking fountains, barbeques, a large dome gazebo, a dog run, and men and women restrooms.
Williams	Redinger Park Location: 9th Street/G Street	Playground area, soccer field, picnic tables and benches, men and women's restrooms.
Williams	Venice Park Location: Venice Boulevard between E Street and Westgate Drive	Playground area, baseball field, horse shoe pits, picnic tables, large open play area, and men and women's restrooms.
Williams	Valley Vista Park Location: Husted Road	Six full size basketball courts, walking/jogging trail, and nature pond area.
Williams	Pool Location: Western end of D Street	Amenities include a 105 foot long pool, diving board, slide, and men and women's restrooms.
Williams	Museum Location: E Street/Venice Boulevard	Built in 1911 as Williams High School, the Sacramento Valley Museum offers regional exhibits that feature items from the late 19th and early 20th century.
Williams	Valley Ranch Playground Location: White Oaks Drive/Sierra Oaks Drive	A neighborhood park located in the Valley Ranch Subdivision, the City is currently in the process of installing playground equipment in this park.
Maxwell	Maxwell Rodeo Grounds	Rodeo Grounds
Maxwell	Maxwell School District	Sports fields, playgrounds, and hard courts.

Table 3.4-1: Inventory of County Parks by Community

Arbuckle	Arbuckle Little League Park (Ball Four Park) Corner 10th & Garrett Street	Sports fields
Arbuckle	LaVanche Hursh Park Downtown Arbuckle	Picnic areas, a covered pergola for events in the park, and central location for community events.
Arbuckle	Veterans Memorial Park Hall St and SR 99	Picnic areas, veteran's memorial.
Arbuckle	Wee Park Old hwy 99 and Hillgate Road	Tot playground, community beautification.
Stonyford	Stonyford Rodeo Grounds	Rodeo Grounds
Stonyford	Stonyford Park	Sports fields, picnic areas
Stonyford/Lodoga	East Park Reservoir	Camping/recreational area

3.5 LIBRARIES AND OTHER COMMUNITY FACILITIES

EXISTING FACILITIES

Libraries

The Colusa County Library has one main library and six branch libraries. The library owns 91,500 books, magazines, and movies. The Local History Collection contains over 2,500 items relating to the history of the region and genealogy of inhabitants. The main County Library is located in the City of Colusa. The location of the main library and the six branch libraries is shown in Table 3.5-1 below.

Table 3.5-1: County Library Facilities

Library	Location
Colusa County Library	738 Market Street, Colusa
Arbuckle Branch Library	610 King Street, Arbuckle
Grimes Branch Library	240 Main Street, Grimes
Maxwell Branch Library	34 Oak Street
Princeton Branch Library	232 Prince Street, Princeton
Stonyford Branch Library	5080 Stonyford-Lodoga Road, Stonyford
Williams Branch Library	901 E Street, Williams

SOURCE: COLUSA COUNTY LIBRARY, 2009.

Museums

The Sacramento Valley Museum is located at 1491 E Street in Williams. The museum includes 27 rooms that depict life in the Sacramento Valley between the mid-1800's and 1930's.

Health Care

The Colusa Regional Medical Center (CRMC) is the only acute care hospital in Colusa County. Patients requiring more comprehensive care generally go to Rideout Memorial Hospital in Marysville, Enloe Medical Center in Chico, Woodland Memorial Hospital in Woodland, or larger facilities in Sacramento. Colusa Regional Medical Center operates a county-wide health system consisting of a 48-bed acute care hospital and skilled nursing facility, a Home Health Agency, and rural health clinics located in the communities of Arbuckle, Colusa, Stonyford and Williams.

3. COMMUNITY SERVICES AND FACILITIES

CRMC offers a wide range of services including childbirth services, adult medical and surgical care, emergency medicine, long-term skilled nursing care, laboratory services, imaging and radiographic services, physical rehabilitation, home health and palliative care, outpatient clinic services, and other specialized programs.

Since becoming a community owned and governed hospital on September 1, 2001, several million dollars have been invested in improvements in CRMC's physical plant, program expansion, and acquisition of diagnostic and therapeutic equipment and technology. Over 14,000 square-feet of medical office space was constructed and brought on-line in 2006. An Urgent Care and Medical Center was opened in 2006 in the city of Williams. Two rural health clinics were opened in 2007 to serve the growing needs of the communities of Arbuckle and Stonyford. In 2008, the CRMC Rehabilitation Center was opened on the hospital campus offering the latest in Physical, Occupational and Speech therapies. The summer of 2008 saw the remodeling of the CRMC Birthing Center and Maternity Department.

The Arbuckle Family Health Center, operated by Del Norte Clinics, Inc., provides primary medical and dental care services. The Arbuckle Family Health Center serves a diverse population and offers programs specifically for low income persons and farmworkers.

Insert Figure 3.1.1-1

4. HAZARDS AND SAFETY

This section addresses hazards, as well as other issues and topics related to health and safety within Colusa County. Some of these hazards may be naturally induced, such as seismic, geologic, or wildfire hazards. Other health and safety hazards may be the result of natural hazards, which are exacerbated by human activity, and the alteration of the natural environment, such as urban fire hazard, and development in sensitive areas such as floodplains. Additional hazards are human-made, including airport crash hazards and exposure to hazardous materials.

This chapter is divided into the following sections:

- Seismic and Geologic Hazards (4.1)
- Fire Hazards (4.2)
- Flooding (4.3)
- Air Traffic (4.4)
- Hazardous Materials and Waste (4.5)

4.1 SEISMIC AND GEOLOGIC HAZARDS

Colusa County lies on the boundary between the Great Central Valley and Coast Ranges Geomorphic Provinces. At its lowest, the elevation in eastern Colusa County is approximately 40 feet above sea level. Snow Mountain, in northwestern Colusa County has an elevation of slightly over 7,000 feet. While the county tends to increase in elevation from east to west, the higher elevations of the Coast Ranges are fragmented by alluvial valleys¹ in places.

While it has experienced ongoing sedimentation since the Jurassic, the Central Valley is generally described as Quaternary sedimentary deposits. The Quaternary alluvial deposits of the Central Valley occupy the eastern one-half of the county. Alluvial deposits are found in northwestern Colusa County along Stony Creek. Finally, alluvial deposits are found in western Colusa County along Bear Creek. The Coast Ranges, which occupy western Colusa County, are dominated by Mesozoic sedimentary shelf and slope rocks and the Franciscan Formation. In addition, serpentinized ultramafic rocks are found along the western boundary of the Franciscan Formation.

REGULATORY FRAMEWORK

FEDERAL

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act of 1977 (42 USC, 7701 et seq.) requires the establishment and maintenance of an earthquake hazards reduction program by the federal government.

Executive Order 12699

This order implements provisions of the Earthquake Hazards Reduction Act for “federal, federally assisted or federally regulated new building construction” and requires the development and implementation of seismic safety programs by federal agencies.

¹ Bear Valley and Indian Valley, both north-south trending features, are prominent examples.

STATE

California Building Standards Code (CBSC)

The CBSC is set forth in Title 24 of the California Code of Regulations (CCR). The CBSC includes codes that establish standards for new buildings, existing buildings, historical buildings, fire safety, energy. The CBC is contained within the California Building Standards Code). Per state law, building standards are enforceable only to the extent that they are centralized (in Title 24).

CA Health and Safety Code

Section 19100 et seq. of the California Health and Safety Code establishes the state's regulations for earthquake protection. This section of the code requires structural designs to be capable of resisting likely stresses produced by phenomena such as strong winds and earthquakes.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces.

Cities and counties must regulate certain development projects within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

California Department of Transportation Highway Design Manual

The California Department of Transportation (Caltrans) sets forth roadway design standards for seismic safety in the latest version of the *Highway Design Manual* (originally published in 1995).

LOCAL

County Code

Chapter 5: Building Code

The purpose of the Colusa County Building Code is to “enact regulations relating to buildings and structures, imposing restrictions thereon and to provide for their enforcement.” The County has adopted the CBC without amendment.

Chapter 6: Emergency Services

This chapter establishes emergency preparedness and response standards and authorizes the development of mutual aid and response plans.

Chapter 9: Land Grading and Leveling

This chapter establishes grading plan content and public works review requirements. This chapter states that no person shall grade or level, cause to be graded or levelled, or commence grading or levelling operations upon any land area of five or more acres, or move, excavate, remove, dredge, pile or stockpile earth or other material so as to change, or cause to be changed, the natural course of any channel or waterway without first having complied with the provisions of this chapter.

SEISMIC HAZARDS

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal source of seismic hazards in areas devoid of active faults. All areas of the state are subject to some level of seismic ground shaking.

Several scales may be used to measure the strength or magnitude of an earthquake. Magnitude scales (ML) measure the energy released by earthquakes. The Richter scale, which represents magnitude at the earthquake epicenter, is an example of an ML. As the Richter scale is logarithmic, each whole number represents a 10-fold increase in magnitude over the preceding number. The following table represents effects that would be commonly associated with Richter Magnitudes:

Magnitude	Effects
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.4 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	“Major Earthquake” with the ability to cause damage over larger areas
≥ 8	“Great Earthquake” can cause damage over several hundred miles

Moment Magnitude (Mw) is used by the United States Geological Service (USGS) to describe the magnitude of large earthquakes in the US. The value of *moment* is proportional to fault slip multiplied by the fault surface area. Thus, *moment* is a measurement that is related to the amount of energy released at the point of movement. The Mw scale is often preferred over other scales, such as the Richter, because it is valid over the entire range of magnitudes. *Moment* is normally converted to Mw, a scale that approximates the values of the Richter scale.

An earthquake’s strength can also be expressed in terms of “Acceleration.” The horizontal acceleration of the Earth during an earthquake can be described in terms of its percentage of gravity (g). Furthermore, seismic hazards can be estimated by calculating the probability of a seismic event in a given area over a specific amount of time. For example, the USGS calculates the probability of exceeding (%g) in 50 years. The likely rates of horizontal acceleration in Colusa County tend to increase from east

4. HAZARDS AND SAFETY

to west. The following represents a generalization of the 10 percent probability of exceedance in 50 years for Colusa County, as identified by the USGS:

TABLE 4.1-2: 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS (%g)		
Western County	Central County	Eastern County
< 40%	20% - 30%	≈ 15%

In contrast, other scales describe earthquake intensity, which can vary depending on local characteristics. The Modified Mercalli Scale (MM) expresses earthquake intensity at the surface on a scale of I through XII. The following table represents the potential effects of an earthquake based on the Modified Mercalli Intensities:

TABLE 4.1-3: MODIFIED MERCALLI INTENSITIES AND EFFECTS	
MM	Effects
I	Movement is imperceptible
II	Movement may be perceived (by those at rest or in tall buildings)
III	Many feel movement indoors; may not be perceptible outdoors
IV	Most feel movement indoors; Windows, doors and dishes will rattle
V	Nearly everyone will feel movement, sleeping people may be awakened;
VI	Difficulty walking; Many items fall from shelves, pictures fall from walls
VII	Difficulty standing; Vehicle shaking felt by drivers; Some furniture breaks
VIII	Difficulty steering vehicles; Houses may shift on foundations
IX	Well-built buildings suffer considerable damage; ground may crack
X	Most buildings and foundations and some bridges destroyed
XI	Most buildings collapse; Some bridges destroyed; Large cracks in ground
XII	Large scale destruction; Objects can be thrown into the air

As mentioned previously, all of California is subject to seismic ground shaking. Thus, while there are no known active faults within the county, the area could experience considerable ground shaking generated by faults outside Colusa County. For example, southeastern Colusa County could experience intensities of MM VII to VIII generated by seismic events occurring in Sutter County.

The *Significant United States Earthquakes 1568 – 2004* data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within Colusa County. However, significant earthquakes are documented in three adjacent counties: Butte, Glenn and Lake, as identified in the following tables:

TABLE 4.1-4: SIGNIFICANT EARTHQUAKES IN BUTTE COUNTY

ML	MM	Location	Year
4.60	5	Northern California	1975
4.00	3	Northern California	1975
4.30	--	Northern California	1975
4.60	--	Northern California	1975
4.10	--	Northern California	1975
4.70	4	Northern California	1975
3.60	--	Northern California	1975
4.90	4	Northern California	1975
4.70	4	Northern California	1975
4.50	--	Northern California	1975
6.15	8	Northern California	1975
4.70	--	Northern California	1975
4.60	--	Northern California	1975
4.10	4	Northern California	1975
5.10	--	Northern California	1975
5.20	6	Oroville Area, CA	1975
4.30	5	Northern California	1975
4.10	5	Northern California	1976
4.50	5	Northern California	1990
4.90	5	Northern California	1992
4.60	--	Northern California	2000

TABLE 4.1-5: SIGNIFICANT EARTHQUAKES IN GLENN COUNTY

ML	MM	Location	Year
4.50	7	Near Willows, CA	1903
4.60	5	Northern California	1941
4.70	6	South of Willows, CA	1968

TABLE 4.1-6: SIGNIFICANT EARTHQUAKES IN LAKE COUNTY

ML	MM	Location	Year
--	6	Near Cloverdale, CA	1885
--	6	Near Upper Lake, CA	1906
--	6	Near Upper Lake, CA	1906
--	6	Near Talmage, CA	1938
4.40	6	Near Lakeport, CA	1954
3.60	6	Near Lower Lake, CA	1955
4.60	6	Near Lower Lake, CA	1955
4.50	5	Northern California	1990
4.90	5	Northern California	1992
4.60	--	Northern California	2000

4. HAZARDS AND SAFETY

Finally, the county could be subject to major earthquakes along currently unrecognized faults. The 1983 Coalinga Quake, at the Central Valley/Coast Range boundary, was a major seismic event (ML 6.5 – 6.7) that took place on a previously unknown fault. The 1994 Northridge Quake (Mw 6.7) took place along a “blind” thrust fault, over 10 miles below the surface.

Liquefaction

Liquefaction, which is primarily associated with loose, saturated materials, is most common in areas of sand and silt or on reclaimed lands. Cohesion between the loose materials that comprise the soil may be jeopardized during seismic events and the ground will take on liquid properties. Thus, liquefaction requires specific soil characteristics and seismic shaking.

In collaboration with the USGS Earthquake Hazard Program, the California Geological Survey (CGS) produces liquefaction Susceptibility Maps and identifies “Zones of Required Investigation” per the state’s Seismic Hazard Zonation Program.

The article *Mapping Liquefaction-Induced Ground Failure Potential* (Youd and Perkins, 1978) provides a generalized matrix to demonstrate the relationship between liquefaction potential and depositional landscapes. The following table, which is recreated from Youd and Perkins, demonstrates the general relationship between the nature and age of sediment and the anticipated liquefaction potential:

TABLE 4.1-7: LIQUEFACTION POTENTIAL BASED ON SEDIMENT TYPE AND AGE OF DEPOSIT				
Sediment	Susceptibility Based on Age of Deposits (Years Before Present)			
	Modern (< 500 years)	Holocene (< 10,000)	Pleistocene (< 2Million)	Pre-Pleistocene (> 2 Million)
River Channel	Very High	High	Low	Very Low
Flood Plain	High	Moderate	Low	Very Low
Alluvial Fan/Plain	Moderate	Low	Low	Very Low
Lacustrine/Playa	High	Moderate	Low	Very Low
Colluvium	High	Moderate	Low	Very Low
Talus	Low	Low	Very Low	Very Low
Loess	High	High	High	- ? -
Glacial Till	Low	Low	Very Low	Very Low
Tuff	Low	Low	Very Low	Very Low
Tephra	High	High	- ? -	- ? -
Residual Soils	Low	Low	Very Low	Very Low
Sebka	High	Moderate	Low	Very Low
Un-compacted Fill	Very High	NA	NA	NA
Compacted fill	Low	NA	NA	NA

The CGS Liquefaction Susceptibility Maps and “Zones of Required Investigation” are produced per the state’s Seismic Hazard Zonation Program. In Northern California, the areas of high liquefaction potential identified by the CGS are confined to the nine counties comprising the Bay Area.

Logically, the Sacramento River corridor presents the greatest likelihood of loose sediment and saturated soils within Colusa County. In contrast, eastern Colusa County is the least prone to strong seismic ground shaking.

The Bear Valley area in western Colusa County is largely comprised of alluvium. Similarly, the Stony Creek Basin in the northwestern area of the county is comprised largely of alluvium. Alluvial deposits are also present, to a lesser degree, in the Funks Creek and Antelope Creek Basins.

Structural Damage

Seismic events can have particularly negative effects on older buildings constructed of unreinforced masonry (URM), including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Colusa County is within the less hazardous Zone 3.

Areas of the state within Zone 4 are subject to a series of regulations mandating URM identification and retrofitting actions. Compared to other areas of the county, the City of Colusa could experience disproportionately high levels of structural damage due to the concentration of historic structures in the downtown area. However, relative to URM hazards in Zone 4, the risk of structural damage in Colusa is comparatively low.

Delineating Faults and Seismic Hazards

Alquist-Priolo Fault Zones: An active earthquake fault, per California's Alquist-Priolo Act, is one that has ruptured within the Holocene Epoch (≈11,000 years). Based on this criterion, the CGS identifies Earthquake Fault Zones. These Alquist-Priolo Fault Zones are identified in Special Publication 42 (SP42), which is updated as new fault data become available. Table 4 of SP42 lists all counties and cities within California that are affected by designated Earthquake Fault Zones. The Fault Zones are delineated in Figure 4 and Figures 4A through 4J of SP42 (Earthquake Fault Zone Maps).

No Alquist-Priolo Earthquake Fault Zones are identified within the County of Colusa.

Seismic Hazard Zones: The state Seismic Hazards Mapping Act (1990) addresses hazards along active faults. The Northern California counties affected by the Seismic Hazard Zonation Program include Alameda, San Francisco, San Mateo and Santa Clara.

No Seismic Hazard Zones are identified within the County of Colusa.

USGS Seismic Hazard Maps: In addition to the CGS fault delineation activities, the USGS is responsible for the production of National Seismic Hazard Maps. The USGS *Quaternary Fault and Fold Database of the United States* categorizes faults based on the number of years since the last known movement.

USGS Seismic Hazard Faults

Historic: No Historic faults are identified by the USGS in, or around, Colusa County.

Latest Quaternary: Bartlett Springs Fault (Lake County) and the Hunting Creek-Berryessa Complex (Lake and Yolo Counties) are the nearest documented Latest Quaternary Faults.

Late Quaternary: Big Valley (Lake County) and Stony Creek (Glenn County) are the nearest Late Quaternary Faults identified by the USGS.

Mid-to-Late Quaternary: No Mid-to-Late Quaternary faults are identified in, or around, Colusa County.

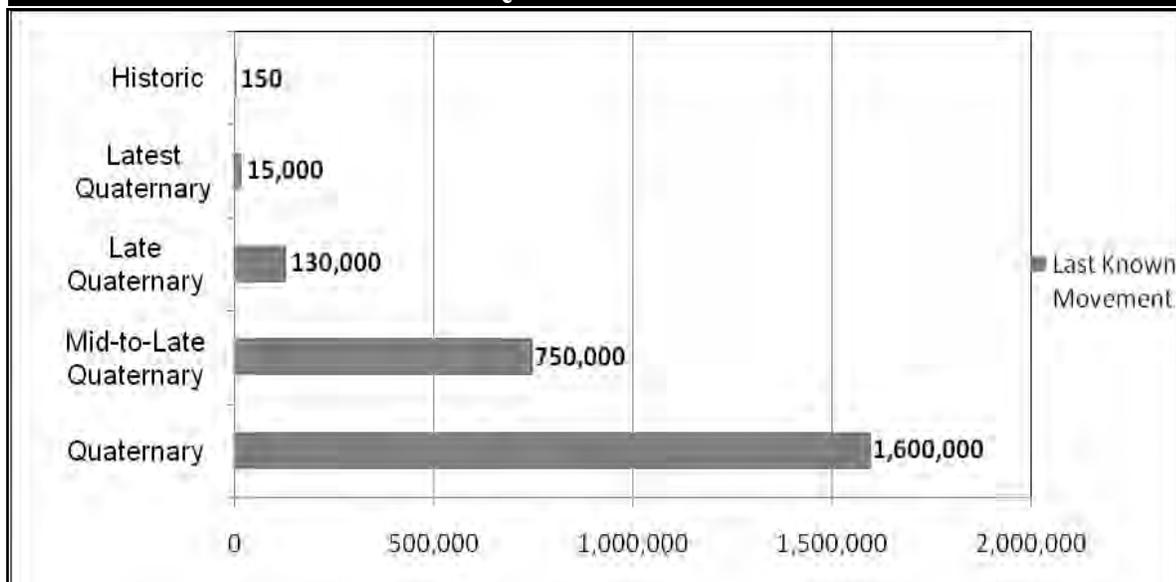
4. HAZARDS AND SAFETY

Quaternary Faults: Segments 1, 2 and 3 of the Great Valley Complex are identified by the USGS within the boundaries of Colusa County. These segments are designated as Class B in the National Seismic Hazard Maps “Fault Parameters.”

TABLE 4.1-8: GREAT VALLEY FAULT PARAMETERS

Fault	Slip Rate	Mw
Great Valley 1	0.1 mm/year	6.7
Great Valley 2	0.1 mm/year	6.4
Great Valley 3	1.5 mm/year	6.9

TABLE 4.1-9: QUATERNARY FAULT CATEGORIES



The 2008 Update to the National Seismic Hazard Maps identifies two types of fault sources in California. “Class A” faults are well-defined faults, with published information on geometry, slip rates, sequences and historic activity. In contrast, “Class B” fault characteristics are identified through published data addressing slip rates and geometry.

OTHER GEOLOGIC HAZARDS

Seiches

Seiches are standing waves that occur in relatively large, enclosed bodies of water that can follow seismic, landslide and other events. In California, Lake Tahoe is the principal body of water subject to *seiche* hazards. The relatively high potential for *seiches* is a product of Lake Tahoe’s size and depth combined with the Eastern Sierra’s tectonic activity.

The CGS publication entitled *Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings* is used to determine the adequacy

of geotechnical investigations for public facilities per CCR, Title 24. *Tsunami* and *seiches* fall under the heading “Exceptional Geologic Hazards,” which states:

Tsunami or Seiche — only for low-lying sites close to California coastline or large lakes and reservoirs

In the CGS report *The Shakeout Scenario*, the implications of a major earthquake were analyzed for eight Southern California counties: Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura. The analysis of secondary impacts included consideration of landslides, liquefaction, *tsunami* and *seiches*. The report states that *tsunami* and *seiches* were not considered secondary hazards because they would not produce significant impacts within the eight-county study area.

Western Colusa County is well over 50 miles, as the crow flies, from the Pacific Coast. *Tsunami* impacts would not be anticipated within the Planning Area. Similarly, there is little indication that *seiches* would be a significant, secondary seismic hazard within Colusa County. However, standing waves could occur in many of the reservoirs found throughout the county. The most notable of these water bodies is East Park Reservoir, which has a surface area of nearly 1,700 acres.

Landslide

Professional Paper 1183 (USGS, 1982) identifies landslide² potentials for physical sub-regions of the United States. The USGS *Landslide Incidence and Susceptibility* spatial data delineate documented landslide events as well as levels of landslide susceptibility for physical sub-regions. The CGS, in cooperation with the USGS, participates in the Landslide Inventory Pilot Project. The CGS landslide hazard data, as with the seismic hazard data, are primarily focused on the Bay Area and Southern California.

The landslide susceptibility for a given sub-region is normally identified by the USGS as high, moderate or low. A sub-region with landslide involvement of ≥ 15 percent of its total area is considered to have a high susceptibility. A total landslide involvement area of 1.5 percent to 15 percent results in a moderate designation for the corresponding sub-region. Low landslide susceptibility corresponds with <1.5 percent landslide involvement throughout a region’s total area.

Landslide potentials in Colusa County are influenced by physical factors, such as slope, soil and precipitation. The landslide susceptibility in the eastern one-half of the county is generally low. A north-south band of moderate landslide potential stretches from East Park Reservoir south to the Bear Valley. Generally, this area of moderate potential frames the north-south trending valleys at the Coast Range/Central Valley boundary. Only the northwestern portion of the county is within a sub-region of high landslide susceptibility. This area of high susceptibility is almost entirely within the boundaries of the Mendocino National Forest.

Erosion

The US Natural Resources Conservation Service (NRCS) delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of erosion factors is provided by the NRCS Physical Properties Descriptions:

² The term “landslide” broadly describes any number of gravitational mass movements (slumps, falls, slides, et cetera).

4. HAZARDS AND SAFETY

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water...Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

As mentioned above, the Kw factor for a given soil can range from 0.02 to 0.69, with 0.69 being the most “erodible.” Soils data for Colusa County were obtained from the NRCS in order to identify the spatial distribution erosion factors. In the following table, erosion factor Kw represents erodibility of the whole soil, as the estimates are modified by the presence of rock fragments. The table identifies approximate countywide acreages and percentages of total county area for low, moderate, high and very high erosion factor soils. The westernmost portion of the county, primarily in the area of the Mendocino National Forest, has not been surveyed. Areas without soils data and surface water are represented in the “No Value” row in the table.

Kw	Acres	Percent
≤ 0.17	9345.7	1.30%
0.17 - 0.35	436347.1	59.00%
0.35 -0.52	196851	26.70%
0.52 -0.69	0	0.00%
No Value	97782.5	13.30%
Total	740326	100%

As identified in the table, very little of the surveyed portion of the county contains soils with a low erosion factor. In addition, no soils with a very high erosion factor are identified within the county. Moderate erosion factors dominate the county’s surveyed soils. High erosion factors are found primarily along the Sacramento River corridor and along the Coast Range/Central Valley boundary.

Subsidence

While land subsidence can be caused by fault rupture and liquefaction, it is often the result of resource extraction and land use practices. In terms of both speed and distance, the downward movement can be slight to severe.

In some cases, subsidence occurs over subterranean voids. These voids are often created during resource extraction activities, such as coal, metallic ore and limestone mining. According to the *Multi-Hazard Identification and Risk Assessment* (FEMA, 1997), 71 percent of the developed land that is threatened with this type of subsidence is within Pennsylvania, Illinois and West Virginia.

In other cases, subsidence can be the product of sediment compaction, which is often caused by fluid withdrawal activities. The fluid pressure in sediments supports some of the weight of the material above a subsurface reservoir. As the fluid is extracted, the solid material must bear the overburden to the extent that the support from fluid pressure is lost. Sediment compaction can occur if excessive fluid is extracted and the remaining solid material is compressible. For example, subsidence has been documented in areas where groundwater extraction has consistently exceeded recharge. In some cases, the drainage of highly organic soils can lead to sediment compaction that is exacerbated by biological oxidation and extreme desiccation. This phenomenon is limited to areas with organic soils, such as peat or muck.

Subsidence has been documented in some areas of the Sacramento Valley. For example, marked subsidence has been documented in eastern Yolo County, apparently the result of non-sustainable levels of groundwater extraction. In the Sacramento/San Joaquin Delta, subsidence has been associated with the drainage of organic soils and sediment compaction, which has been exacerbated by biological oxidation and extreme desiccation.

The report *Ground Water Levels in the Sacramento Valley Groundwater Basin – Colusa County* (DWR, 1994) summarizes hydrographs dating to the 1920s, from 114 groundwater wells in Colusa County. Water management and delivery practices appear to have rectified declining ground water levels that were documented into the 1960s. The application of surface water, which coincided with the abandonment of large-scale groundwater extraction, also appears to have stabilized annual fluctuations in groundwater levels that were experienced prior to the late 1960s.

Expansive Soils

The NRCS delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of linear extensibility is provided by the NRCS Physical Properties Descriptions:

"Linear extensibility" refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

The linear extensibility of the soils within Colusa County ranges from Low to Very High. Based on NRCS data, there are over 733,000 acres of land and nearly 7,000 acres of water within Colusa County. Of the ±733,000 acres of soils within the county, the following amounts fall within the four linear extensibility categories:

- Low: ±218,000 acres (29 percent)
- Moderate: ±219,000 acres (29.9 percent)
- High: ±140,000 acres (18.8 percent)
- Very High: ±157,000 acres (21.3 percent)

Therefore, approximately two-thirds of the county's land surface is comprised of soils that would require special design considerations due to shrink-swell potentials. Three general areas of low linear extensibility are found within the county. These generalized areas are as follows: the northwest corner of the county (west of Stonyford), along the Coast Range/Central Valley Boundary (east of East Park Reservoir and Bear Valley), and along the Sacramento River.

Volcanism

The USGS identifies two principal areas of volcanic hazards in Northern California: the Shasta, Medicine Lake Highland, and Lassen Peak Area and the Clear Lake Area. Mount Shasta and Lassen Peak are located at the southern terminus of the Cascade Range and the associated subduction zones along the

4. HAZARDS AND SAFETY

west coast of North America. The Clear Lake Volcanic Field is markedly different in its origins and topographic characteristics. Relative to tectonic activity, the Coast Range has been subjected primarily to the lateral faulting of the San Andreas system. The largest volcanic feature within the Clear Lake Field is Mount Konocti, located along the south shore of Clear Lake.

Relative to Colusa County, the Clear Lake Volcanic Field is the nearest source of documented volcanic hazards. In contrast to the volcanoes of the southern Cascades, such as Lassen and Shasta, the Clear Lake Field is not associated with subduction. The Clear Lake and Sonoma volcanic phenomena are within the San Andreas Fault system. According to Wood and Kienle (1990), the field is lacking eruptive centers and volcanism tends to be non-explosive.

The following table is recreated from the Summary of Holocene eruptive activity and probable greatest hazards from future eruptions at volcanic centers in California (USGS Cascade Volcano Observatory, 2000), with citations from Berry et al (1976); Hearn et al (1976); and Sims & Rymer (1975).

TABLE 4.10-11: CLEAR LAKE VOLCANIC CENTER HOLOCENE ERUPTIONS	
Recognized Products of Recent Eruptions	
<i>Lava Flows/Cinder Cones</i>	--
<i>Domes</i>	--
<i>Tephra</i>	Mafic tephra from eruptions ±10,000 YBP
<i>Pyroclastic Flows</i>	--
<i>Blasts and Pyroclastic Surges</i>	Phreatic eruptions, hydro-magmatic explosions, base-surges
<i>Debris Flows/Avalanches</i>	--

Sims and Rymer (1975) estimate the most recent eruption for the Clear Lake Field occurred approximately 10,000 years before present. That event is thought to have produced mafic tephra generated by phreato-magmatic explosions. The USGS identifies the Clear Lake Field's "most probable" potential hazards as phreatic explosions, phreato-magmatic explosions and base surges. These events could result in "small-volume" tephra eruptions.

Therefore, volcanic hazards are most likely in the westernmost areas of the county, which are nearest to the Clear Lake Field. However, given the nature of the most probable potential hazards and the distance from Colusa County, the Clear Lake Field is not likely to generate significant impacts in the county.

Naturally Occurring Asbestos

The term "asbestos" is used to describe a variety of fibrous minerals that, when airborne, can result in serious human health effects. Naturally Occurring Asbestos (NOA) is commonly associated with ultramafic rocks and serpentinite.

Appendix D of the Colusa County APCD Rules and Regulations is entitled "Asbestos Airborne Toxic Control Measure for Asbestos Containing Serpentine." Per Appendix D, the term asbestos is defined as follows:

"Asbestos" means asbestiforms of the following hydrated minerals; chrysotile (fibrous serpentine), crocidolite (fibrous riebeckite), amosite (fibrous cummingtonite--grunerite), fibrous tremolite, fibrous actinolite, and fibrous anthophyllite.

Ultramafic rocks, such as dunite, peridotite and pyroxenite, are igneous rocks comprised largely of iron-magnesium minerals. As they are intrusive in nature, these rocks often undergo metamorphosis, prior to their being exposed on the Earth's surface. The metamorphic rock serpentinite is a common product of the alteration process. A variety of minerals may be present within the host rock, including chrysotile, tremolite and actinolite.

Chrysotile, which is also known as "white asbestos" and found in serpentine rocks, is probably the most common NOA. However, other types of asbestos, such as tremolite-actinolite, can also be found throughout California. Tremolite is most commonly associated with metamorphic formations containing dolomite and quartz. Tremolite tends to be whitish when magnesium-rich and trends towards dark green as iron increases. Actinolite, which can be found in metamorphic rocks rich in magnesium or iron, tends to be green to blackish-green.

In Colusa County, the boundary between the Coast Range and the Central Valley is the area of greatest NOA potential. The rocks at this boundary have been subjected to forces that are likely to have produced partial or entire metamorphosis into serpentinite. This area of potential NOA generally extends north from SR 20 (along the Colusa/Lake County boundary) to the Colusa/Glenn County boundary (west of Lodoga and Stonyford). Thus, the majority of the lands with high NOA potential in Colusa County are under BLM and USFS jurisdiction.

4.2 FIRE HAZARDS

Wildfires are a potential hazard to development and land uses located in the foothill and mountain areas of the County. The severity of wildfire problems depends on a combination of vegetation, climate, slope and people. The grassland, chaparral, woodland, and forest vegetation found in areas of Colusa County, coupled with hot, dry summers, present extreme fire hazards during critical fire periods for approximately 50 percent of the County. In addition to natural factors such as lightning, human activity is a primary factor contributing to the incidence of wildfires. Campfires, smoking, debris burning, arson and equipment use are common human-related causes of wildfires.

This section addresses the hazards associated with wildfires in Colusa County. The discussion of fire suppression resources is located in the Community Services and Facilities section (Section 3) of this Background Report.

REGULATORY SETTING

FEDERAL

FY 2001 Appropriations Act

Title IV of the Appropriations Act required the identification of "Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire" by the US Departments of the Interior and Agriculture.

STATE

CA Government Code Section 65302

This section, which establishes standards for developing and updating General Plans, includes fire hazard assessment and Safety Element content requirements.

Assembly Bill 337

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CalFire) are required to identify “Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

CA Public Resources Code

The state’s Fire Safe Regulations are set forth in Public Resources Code §4290, which include the establishment of State Responsibility Areas (SRA).

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone that *...owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material (§4291(a)).*

Uniform Fire Code

The Uniform Fire Code (UFC) establishes standards related to the design, construction and maintenance of buildings. The standards set forth in the UFC range from designing for access by firefighters and equipment and minimum requirements for automatic sprinklers and fire hydrants to the appropriate storage and use of combustible materials.

CA Code of Regulations Title 8

In accordance with CCR, Title 8, §1270 and §6773 (*Fire Prevention and Fire Protection and Fire Equipment*), the Occupational Safety and Health Administration (Cal OSHA) establishes fire suppression service standards. The standards range from fire hose size requirements to the design of emergency access roads.

CA Code of Regulations Title 14 (Natural Resources)

Division 1.5 (Department of Forestry and Fire Protection), Title 14 of the CCR establishes a variety of wildfire preparedness, prevention and response regulations.

CA Code of Regulations Title 19 (Public Safety)

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention and construction and construction materials standards.

CA Code of Regulations Title 24 (CA Building Standards Code)

The California Fire Code is set forth in Part 9 of the Building Standards Code. The CA Fire Code, which is pre-assembled with the International Fire Code by the ICC, contains fire-safety building standards referenced in other parts of Title 24.

CA Health and Safety Code and UBC Section 13000 et seq.

State fire regulations are set forth in §13000 *et seq.* of the California Health and Safety Code, which is divided into “Fires and Fire Protection” and “Buildings Used by the Public.” The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

CA Health and Safety Code Division 11 (Explosives)

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 et seq. establishes regulations related to explosives and explosive devices, including permitting, handling, storage and transport (in quantities greater than 1,000 pounds).

CA Health and Safety Code Division 12.5 (Buildings Used by the Public)

This Division establishes requirements for buildings used by the public, including essential services buildings, earthquake hazard mitigation technologies, school buildings and postsecondary buildings.

CA Vehicle Code §31600 (Transportation of Explosives)

Establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

*LOCAL***Sonoma-Lake-Napa Fire Plan (2005)**

The Sonoma-Lake-Napa Unit (LNU) of the CDF prepared the *Fire Management Plan* as a planning tool to reduce wildfire impacts throughout Sonoma, Lake, Napa, Yolo, Solano and Colusa Counties. The Plan identifies high value, high-risk areas in the six counties comprising the LNU.

Colusa County Code

The Colusa County Code contains numerous measures and policies related to fire prevention and the reduction of fire hazards. Fire reduction and prevention measures are found in the following chapters of the Colusa County Code:

- Chapter 5: Building Code
- Chapter 6: Emergency Services
- Chapter 7: Fire Prevention
- Chapter 7A: Weed Abatement
- Appendix I: Zoning

IDENTIFYING FIRE HAZARDS**Fuel Rank**

Fuel rank is a ranking system developed by CDF that incorporates four wildfire factors: fuel model, slope, ladder index and crown index.

The USFS has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CDF, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index and crown index for a given area are combined in order to establish a fuel rank of medium, high or very high. Fuel rank is used by CDF to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The eastern portion of the county, generally coinciding with the Sacramento Valley, is primarily devoid of CDF fuel ranks. The exceptions are pockets of grasslands that possess characteristics warranting “moderate” fuel ranks. These areas possess combustible material in sufficient quantities to pose a wildfire risk. However, the areas lack the topographic characteristics that could significantly affect fire behavior. In contrast, CDF data for the western portion of the county include a preponderance of “high” and “very high” fuel ranks. The fuel rank transition is generally consistent with the transition from the Sacramento Valley to the Coast Range. The general tendency is for fuel rank severity to increase from east to west and from south to north within the county.

Fire Threat

The fuel rank data are used by CDF to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme.

FIRE HAZARD SEVERITY ZONES

The state has charged CDF with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CDF must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the state Fire Marshall as a basis for the adoption of applicable building code standards. Fire Hazard Severity Zones in Colusa County are shown in Figure 4.2-1.

Local Responsibility Areas

Local Responsibility Areas (LRA) are concentrated in the Sacramento Valley, within the eastern half of the county. At about 360,000 acres, the LRA lands represent roughly one-half of the county’s total area. Less than two percent of the LRA lands within the county are located within “moderate” FHSZ. In contrast, approximately 98 percent of the LRA lands do not warrant a FHSZ rank.

State Responsibility Areas

State Responsibility Areas within Colusa County are primarily found along the foothills, from the Stonyford/East Park Reservoir area in the north to the Cortina Creek area in the south. According to the CDF Fire Plan, over 700 people and nearly 400 houses occupy SRA portions of the county. Furthermore, approximately 90 percent of these people and houses are identified within Direct Protection Areas.

At about 260-270 thousand acres, the SRA coverage equals approximately 35 percent of the county. Almost 200 thousand acres, or about three-quarters of the county’s SRA, are within a “moderate” FHSZ. About 17 thousand acres, or seven percent of the county’s SRA, are within a “high” FHSZ. Finally, about 45 thousand acres, or 17 percent of the county’s SRA, are within a “very high” FHSZ.

Federal Responsibility Areas

Federal Responsibility Areas are concentrated in the westernmost limits of the county. At about 106 thousand acres, the FRA coverage equals approximately 15 percent of the county's area. Over 90 percent of the FRA lands within Colusa County are located within "very high" FHSZ. The vast majority of very high FHSZ lands are found within the Mendocino National Forest, in the northwest corner of the county.

Documented Wildfires

Logically, CDF Fire Perimeter data are prone to reflect the distribution of FHSZ maps. Documented wildfires from the 2008 fire season were concentrated in the western half of the county. Furthermore, fires have tended to increase in size from east to west, as topography and fuels influence fire behavior and inhibit emergency response.

4.3 FLOODING

This section summarizes the major issues related to drainage and flooding in Colusa County, and also provides a discussion of dam safety and hazards from dam inundation. As with most Sacramento Valley counties, Colusa County is subject to flooding problems in its poorly-drained valley floor. Although Colusa County's foothill and upland areas generally do not experience severe flooding, drainage problems can occur in the western portion of the County. Runoff from impervious surfaces is also a concern in the county, particularly as the surface area of impervious cover increases when new development occurs.

Much of the area of eastern Colusa County between the Sacramento River and the Interstate 5 corridor is within the FEMA designated 100-year floodplain. The 100-year floodplain in Colusa County affects portions of the City of Colusa, the City of Williams, Arbuckle, Maxwell, Princeton and Grimes. The 100-year floodplain is shown on Figure 4.3-1 and is discussed in greater detail below.

While information on areas most affected by drainage issues and flooding is available for most of the county's incorporated cities, data on the severity of drainage problems in the unincorporated areas - which comprise much of the county - is more limited.

REGULATORY FRAMEWORK

FEDERAL

Federal Emergency Management Agency (FEMA)

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Rivers and Harbors Appropriation Act of 1899

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

Clean Water Act of 1977

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the US and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the US. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

Flood Control Act

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

National Flood Insurance Program (NFIP)

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

Flood Disaster Protection Act (FDPA)

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited federal assistance, including acquisition, construction and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction and developments within SPHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the BFE.
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE

- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

STATE

Senate Bill 5

This bill requires each city, including a charter city, and county within the Sacramento-San Joaquin Valley, within 24 months of the adoption of a specified flood protection plan by the Central Valley Flood Protection Board, to amend its general plan to include data and analysis contained in that flood protection plan, goals and policies for the protection of lives and property that will reduce the risk of flood damage, and related feasible implementation measures. The bill requires each city, including a charter city, and county within the Sacramento-San Joaquin Valley, within 36 months of the adoption of that flood protection plan but not more than 12 months after the amendment of the general plan under the bill's provisions, to amend its zoning ordinance so that it is consistent with the general plan, as amended. By establishing requirements on cities and counties, the bill imposes a state-mandated local program.

On the effective date of those amendments, a city, including a charter city, and county within the Sacramento-San Joaquin Valley would be prohibited from entering a development agreement for any property that is located within a flood hazard zone unless the city or county makes certain findings, based on substantial evidence.

Assembly Bill 162

This bill requires the land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a state-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 70

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped area, as defined, that is protected by a state flood control project, unless the city or county meets specified requirements.

CA Government Code

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

Section 65302.9

This section requires the incorporation Central Valley Flood Protection Program (CVFPP) data, policies, and implementation measures into general plan updates within the Central Valley.

Section 65860.1

If necessary, zoning ordinances must be amended to ensure CVFPP consistency.

Section 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

In addition, adopted or amended general plans must be referred to the Central Valley Flood Protection Board and any relevant local agencies for planning areas within the boundaries of the Sacramento and San Joaquin Drainage District.

Section 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

Section 65865.5

Within the Central Valley, Lead Agencies are prohibited from entering into development agreements or approving permits, entitlements and subdivision maps for developments within flood hazard zones unless protected by an urban level of flood protection or compliant with FEMA standards.

CALIFORNIA WATER CODE

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Water Code. Key sections related to the above referenced bills are identified below.

Section 9621

Counties within the Central Valley must work with cities to develop an emergency response plan within 24 months of CVFPP adoption.

Section 9622

Counties must collaborate with local flood control agencies, cities and the state to provide relocation assistance or other cost-effective strategies for reducing flood risk to economically disadvantaged communities within non-urbanized areas.

Section 9625

Counties and cities must collaboratively develop funding mechanisms for financing local flood protection responsibilities by Year 2010.

Section 8307

Counties and cities may be liable for fair shares of property damage caused by floods when the state's exposure to liability was increased through the local agency's approval of new development within lands protected by the State Plan of Flood Control.

Section 9650

State funds for the upgrade of project levees protecting areas containing more than 1,000 residents will be subject to safety planning requirements. For example, the local agency responsible for the operation and maintenance of the levee and cities and counties protected by the levee will be required to adopt a safety plan within two-years of state funding.

FloodSAFE California

FloodSAFE is a statewide program launched in 2006 by DWR in order to achieve the following goals: reduce the chance of flooding, reduce the consequences of flooding, sustain economic growth, protect and enhance ecosystems, and promote sustainability. Initial funding was provided by Propositions 1E and 84.

FloodSAFE is responsible for the Central Valley Flood Management Planning Program (CVFMP). The CVFMP is intended to integrate and improve flood management within the Central Valley. Three documents, the State Plan of Flood Control, the Flood Control System Status Report and the Central Valley Flood Protection Plan are the responsibility of the CVFMP.

State Plan of Flood Control

The State Plan of Flood Control (SPFC) for the Central Valley will analyze flood management facilities, lands, programs, conditions, and operations and maintenance for all state/federal flood protection systems within the Central Valley. The SPFC for the Central Valley is anticipated prior to Year 2010.

Flood Control System Status Report

The Status Report will identify deficiencies and make improvement recommendations for flood control facilities within the (SPFC). The report is anticipated prior to Year 2011.

Central Valley Flood Protection Plan

The Central Valley Flood Protection Plan (CVFPP), which must be prepared by January 1, 2012, will describe a system-wide program of flood protection within areas of the Central Valley that are protected by SPFC facilities. The plan must be sustainable, while providing integrated flood management.

Sacramento-San Joaquin River Basin Comprehensive Study

The Comprehensive Study, which has been undertaken as a collaborative effort between the US Army Corps of Engineers (USACE) and DWR, released the first interim report in late 2002. The Central Valley Flood Protection Board (formerly the Reclamation Board) will provide the administrative structure of the plan developed per the Comprehensive Study.

PL84-99 Rehabilitation Assistance

The federal Rehabilitation Assistance Program helps repair levees that are damaged during declared flood emergencies (*PL84-99* is Public Law 84-99 – the federal Flood and Coastal Storm Emergencies Act). The program promotes risk reduction within the Central Valley through evaluating and repairing qualifying levees. Technical support, permitting, rights of way and borrow material are provided by DWR.

Sacramento River Flood Control Project

The Sacramento River Flood Control Project (SRFCP) is actually six, interrelated projects undertaken by the USACE, including reservoirs constructed on major rivers, which constitute the largest flood control system in the state. Project facilities extend from north of Colusa County southward to the Sacramento-San Joaquin Delta, about 230 miles along the Sacramento River corridor. Levees and associated facilities of the SRFCP have been constructed along five rivers, 15 creeks and 13 sloughs. In addition, human-made or human-modified facilities include 6 bypasses and 11 channels.

Sacramento River Bank Protection Project

As authorized by the Flood Control Act of 1970, the Sacramento River Bank Protection Project (SRBPP) is an ongoing construction and maintenance project. The SRBPP provides protection for existing flood control infrastructure, including levees, of the Sacramento River Flood Control Project. The Sacramento River Flood Control Project consists of approximately 980 miles of levees plus overflow weirs, pumping plants, and bypass channels that protect communities and agricultural lands in the Sacramento Valley and Sacramento–San Joaquin Delta.

LOCAL

Colusa County General Plan

The existing Colusa County General Plan identifies the following policies related to flood protection:

SAFE-1 Flood plains should generally be maintained as open space. In these areas, their use for agriculture, recreation, preservation of vegetation and wildlife habitat, and scenery should be encouraged.

SAFE-2 Urban development should be discouraged in the 100-year flood plain. Any habitable structure which is permitted shall be built so that the first floor of living area is above the 100-year flood elevation.

SAFE-3 No critical or high-occupancy structures such as schools, hospitals, police, facilities, or fire stations should be built within the 100-year flood plain.

SAFE-4 The county should support coordinated efforts to maintain levees along the Sacramento River and the 2047 canal.

SAFE-5 Flood control policies in the Community Services Element should be supported to reduce the hazards associated with flooding.

Colusa County Code, Chapter 33: Flood Damage Prevention

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- (a) Protect human life and health;
- (b) Minimize expenditure of public money for costly flood control projects;
- (c) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (d) Minimize prolonged business interruptions;
- (e) Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- (f) Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- (g) Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- (h) Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, this chapter includes methods and provisions to:

- (a) Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- (d) Control filling, grading, dredging, and other development which may increase flood damage; and
- (b) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- (c) Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- (e) Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

A development permit shall be obtained before any construction or other development begins within any area of special flood hazard established in section 33-3.2. Application for a development permit shall be made on forms furnished by the floodplain administrator and may include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- (a) Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures--in zone A, elevation of highest adjacent grade and proposed elevation of lowest floor of all structures; or
- (b) Proposed elevation in relation to mean sea level to which any nonresidential structure will be floodproofed, if required in subsection 33-5.1(C)(3); and
- (c) All appropriate certifications listed in subsection 33.4.3(d) of this chapter; and
- (d) Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

Colusa County Zoning Regulations

Sec. 4.13. Floodway or F-W zone. The floodway or F-W zone is intended to be applied to lands which lie within stream or tidal channels and to adjacent areas which are periodically inundated, or which will be inundated by a "design flood" and to provide reasonable measures for the protection of life and property in floodway areas..

Principal permitted uses:

- (1) General agriculture, but not including building or structures.
- (2) Recreational uses on open land, including public and private parks and golf courses.

Uses permitted with a use permit:

- (1) Private recreation facilities.
- (2) Boat docks and launching facilities.
- (3) Water, sewer, roadway, bridge and other such facilities necessary for public health and safety.
- (4) Minor or temporary structures incidental to agricultural or recreational uses which will not impede flood flow and are of flood-proof design.
- (5) Excavation of natural materials or construction of earthworks or water flow control devices.

Sec. 4.14. Floodplain or F-P zone. The floodplain or F-P zone is intended to be applied to areas other than floodway areas which have been inundated by overflow floodwaters in the past and which may reasonably be expected to be inundated by such floodwaters in the future. The floodplain zone is intended to limit the use of areas subject to such inundation and flooding to protect lives and property from loss, destruction and damage due to floodwaters and to the transportation by water of wreckage and debris.

Principal permitted uses:

- (1) General agriculture, nurseries and greenhouses, and animal sales and feed yards, except as provided in subsection (b) hereof.
- (2) Recreational uses, including public stables, docks, boathouses, golf courses and shooting ranges.

Uses permitted with a use permit:

- (1) Residential uses, including farm dwellings.
- (2) Trailer camps and mobile home parks.
- (3) Recreational uses requiring enclosed buildings.

Colusa County Flood Control and Conservation District

The Colusa County Flood Control and Conservation District is headed by the Board of Supervisors. The purpose of the District is to plan and obtain funding for flood control activities, measures and projects within the county.

ENVIRONMENTAL SETTING

The DWR divides the state into a series of Hydrologic Regions. Each region is divided into Hydrologic Units, which are subsequently divided into Hydrologic Areas. Colusa County is located within the Sacramento River Hydrologic Region (HR). The following hydrologic units (HU) are located within the county: Stony Creek, Cache Creek, Cortina and Colusa Basin. The Stony Creek HU is located in the northeastern area of the county. The Cache Creek HU is located in the southeast area of the county. The Cortina HU trends north/south in central Colusa County. Finally, the Colusa Basin HU encompasses the eastern half of the county.

In the northwestern area of the county, one-hundred year floodplains are delineated along Stony Creek northwest of Stonyford and around the East Park Reservoir, Little Stony Creek and Little Indian Creek near Lodoga. Near Delevan and Maxwell, delineated floodplains are identified along several streams, such as Hunters Creek, Funks Creek, Stone Coral Creek and the Glenn-Colusa Canal. Moving south, delineated floodplains coincide with several drainages, such as Lurline Creek, Freshwater Creek and Salt Creek, while floodplains near Arbuckle have been delineated along Cortina Creek, Sand Creek, Whiskey Creek and Elk Creek.

The lands to the east of Interstate 5 are crisscrossed with levees, canals and natural drainages. In addition, the Colusa Basin and Butte Sink frame the Sacramento River near the northeastern corner of the county. The flood control and water delivery facilities within the county's Planning Area are the product of a complex history of agencies, districts, plans, programs, and regulations.

FEMA Flood Zones

FEMA mapping provides important guidance for the County in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The Countywide FEMA Firm Map is shown on Figure 4.3-1. The California Department of Water Resources has recently completed work to map the 200-year floodplain for many areas of California. Areas within the 200-year floodplain are shown in Figure 4.3-3.

Areas that are subject to flooding are indicated by a series of alphabetical symbols, indicating anticipated exposure to flood events:

4. HAZARDS AND SAFETY

- **ZONE A:** Subject to 100-year flooding with no base flood elevation determined. Identified as an area that has a one percent chance of being flooded in any given year.
- **ZONE AE:** Subject to 100-year flooding with base flood elevations determined.
- **ZONE AH:** Subject to 100-year flooding with flood depths between one and three feet being areas of ponding with base flood elevations determined.
- **ZONE AO:** Subject to 100-year flooding with flood depths between one and three feet being subject to sheet flow on sloping terrain with average depths determined.
- **“SHADED ZONE X”:** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.
- **ZONE D:** Areas where flood hazards are yet to be determined.

Approximately one-quarter (25 percent) of the county is located within an area with an “A” prefix on the corresponding FIRM. Slightly over 30 percent of the county is within an area of an “A” prefix or the 0.2 percent flood hazard area identified on the Colusa County FIRM. Slightly more than 43 percent of the county is located within FIRM flood hazard areas or areas in which flood hazards have yet to be determined (Zone D). Nearly 57 percent of the county is located in areas of low to moderate flood hazards (Zone X).

Zone	Acres	% of County
0.2%	56,477	7.6%
A	162,928	22%
AE	13,533	1.8%
AH	1,060	0.14%
AO	1,389	0.2%
X	42,0261	56.7%
D	85,543	11.5%

The FIRM panels identified by FEMA within Colusa County bear the *06011C* prefix. The Colusa County FIRM data have an effective date of May 15, 2003 (not including revisions and amendments). The Map Description that accompanies the FIRM panels is *Colusa County Uninc & Inc Area*.

Per Senate Bill 5 (2007), DWR has produced Best Available Maps identifying the 100-year and 500-year floodplains within the Sacramento and San Joaquin Valleys. The Preliminary Best Available Maps for the County of Colusa were produced in August of 2008. The maps use letters to identify rows and numbers to identify columns, which divide each county into alphanumeric regions based on a Cartesian plane. Colusa County is divided into 21 alphanumeric regions comprised of Rows A through E and Columns 1 through 5. Thus, Panel A1 covers the most northwestern portion of the county while Panel E5 covers the most southeastern portion.

CVFPB FLOODWAYS

The CVFPB identifies the Colusa Drain as a designated floodway. The Colusa Drain Floodway bisects the county longitudinally, generally paralleling Interstate 5 to the west and SR 45 to the east. The Floodway traverses the eastern portions of the Delevan and Colusa National Wildlife Refuges.

Per the CVFPB, as a Designated Floodway, the Colusa Drain is considered to be the area that is “reasonably required providing for the passage of a design flood.” Uses within the Colusa Drain Floodway are regulated by the provisions of CCR Title 23, Article 5, §107.

CENTRAL VALLEY PROJECT

The following facilities, constructed under the Central Valley Project and under the jurisdiction of the Bureau of Reclamation, are located within Colusa County:

Dams	Canals	Diversions
East Park Dam	Tehama-Colusa Canal	Rainbow Diversion Dam
Funks Dam	East Park Feed Canal	

DAMS

Five dams which retain water from tributaries of the Sacramento River could cause damage in Colusa County if their dams were to fail: Lake Oroville, Lake Shasta, Whiskeytown Lake, Black Butte Lake and East Park Reservoir. In the event of a major dam failure, much of eastern Colusa County could become inundated. A major earthquake centered close to a dam would be the most likely cause of failure.

Per DWR publications *Dams Owned and Operated by a Federal Agency* and *Dams within the Jurisdiction of the State of California*, the following dams are located within Colusa County:

Dam Name	CA Number	National ID
East Park	--	CA10145
Funks	--	CA10245
Upper Letts	--	CA10302

Name	CA Number	Federal ID
Rancho Rubini	361-000	CA00555
York Hill	360-000	CA00554

Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. Inundation maps show areas that lie within the potential dam failure inundation zone, as shown in Figure 4.3-2.

Lake Oroville, which is located in Butte County, would represent the most immediate threat to Colusa County in the event of a dam failure, as flood waters could reach the County within eight hours. Lake Shasta, in Shasta County, could cause the most extensive inundation, reaching as far west as Maxwell

and College City in a period of 42 hours. Inundation from Whiskeytown Lake, located in Trinity County, would take over three days to reach Colusa County. Failure of the dam of Black Butte Lake, which is on the border of Glenn and Tehama Counties, could result in some inundation within a period of about 35 hours. The inundation from a failure of this dam would be less extensive than if the other above-referenced dams were to fail.

Failure of the dam at East Park Reservoir could cause minor inundation at the reservoir's outlet. The flood waters would flow into Glenn County; thus, its failure would not likely impact areas of Colusa County. In Glenn County, the flooding could extend up to one-quarter mile on either side of Stony Creek at its widest point. The water could cause an overflow of Stony Gorge Reservoir, which is located on Stony Creek. Black Butte Reservoir would retain the excess inundation.

DWR LEVEE MAINTENANCE AREAS

In the Central Valley, state flood control levees are typically maintained under one of three circumstances:

- Local agencies maintain more than 1,500 miles of levees in the Central Valley
- DWR maintains specific levee sections described in the Water Code (§8361)
- DWR maintains levees where no local agencies can carry out the maintenance

The latter of these circumstances results in the formation of Maintenance Areas. Two maintenance areas are located within Colusa County along the Sacramento River. Maintenance Area 1 (MA1), which extends from Colusa County's northern boundary south towards the City of Colusa, traverses approximately 17 linear miles of the county. Further south, Maintenance Area 12 (MA12) traverses approximately 12 linear miles of the county.

Levee maintaining agencies are responsible for natural disaster emergency preparations, including training and stockpiling of flood fight supplies. Cities and counties are available to assist with flood fighting if the levee maintaining agency exhausts and cannot obtain necessary materials to continue the flood fight.

During severe storms or other potential flooding conditions, the DWR Chief of Flood Operations is responsible for declaring a flood alert. When a flood alert warning is issued, the Flood Operations Center is activated in accordance with the Standardized Emergency Management System (SEMS). The DWR can upon request, provide technical flood fighting assistance to levee maintaining agencies.

4.4 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2 percent of general aviation accidents occur during takeoff and initial climb and 44.2 percent of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phase of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77 percent of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out (CA Division of Aeronautics, 2002). These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions.

The remaining 23 percent of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern (CA Division of Aeronautics, 2002). Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway (Ibid.).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed.

Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65 percent of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway (Ibid.).

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem.

REGULATORY FRAMEWORK

FEDERAL

Aviation Act of 1958

The federal Aviation Act resulted in the creation of the Federal Aviation Administration (FAA). The FAA was charged with the creation and maintenance of a National Airspace System.

Federal Aviation Regulations (CFR, Title 14)

The Federal Aviation Regulations (FAR) establish regulations related to aircraft, aeronautics and inspections and permitting.

STATE

Aeronautics Act (Public Utilities Code §21001)

The Caltrans Division of Aeronautics bases the majority of its aviation policies on the Aeronautics Act. Policies include permits and annual inspections for public airports and hospital heliports and recommendations for schools proposed within two miles of airport runways.

Airport Land Use Commission Law (Public Utilities Code §21670 et seq.)

The law, passed in 1967, authorized the creation of Airport Land Use Commissions (ALUC) in California. Per the Public Utilities Code, the purpose of an ALUC is to protect *public health, safety, and welfare by encouraging orderly expansion of airports and the adoption of land use measures that minimizes exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses* (§21670). Furthermore, each ALUC must prepare an Airport Land Use Compatibility Plan (ALUCP). Each ALUCP, which must be based on a twenty-year planning horizon, should focus on broadly defined noise and safety impacts.

LOCAL

Colusa County Airport Land Use Commission

The purpose of the Airport Land Use Commission (ALUC) is to:

1. Protect public health, safety, and welfare through the adoption of land use standards that minimize the public's exposure to safety hazards and excess levels of noise.
2. Prevent the encroachment of incompatible land uses around public-use airports, thereby preserving the utility of these airports into the future.

These purposes are implemented through Airport Land Use Commissions, which are allowed in every county with a public use airport or with an airport served by a scheduled airline. The Colusa County Airport Advisory Committee has been designated the ALUC for Colusa County.

Colusa County Airport Comprehensive Land Use Plan (1995)

The Colusa County Airport Comprehensive Land Use Plan (CLUP) establishes land use standards to protect the public from safety hazards and noise impacts and to prevent the encroachment incompatible land uses around the Colusa County Airport.

The CLUP establishes the following land use "Restriction Areas" within the plan boundaries:

CLUP Height Restriction Area: The height restrictions established by the CLUP ensure the protection of the navigable airspace surrounding the airport. The following height restrictions apply within the CLUP:

- Primary Surface: 200 feet beyond the runway in each direction and 250 feet wide
- Horizontal Surface: 5,000 feet from the primary surface 150 feet above the established airport elevation
- Conical Surface: 4,000 feet outward from the horizontal surface and upward from the horizontal surface at a slope of 20:1
- Approach Surface: Outward and upward 5,000 feet from each end of the primary surface at a slope of 20:1; the width is 250 feet at the Primary Surface and 1,250 feet at the 5,000 foot terminus
- Transitional Surface: Outward and upward from the sides of the primary and approach surfaces at a slope of 7:1

CLUP Noise Restriction Area: The noise restriction area established by the CLUP serves to minimize the number of people exposed to aircraft-generated noise. The CLUP establishes Land Use Compatibility Guidelines to analyze potential land uses relative to community noise equivalency level (CNEL). Proposed land uses within the CLUP can be compared to the Compatibility Guidelines and the CNEL noise contours identified in the plan.

CLUP Safety Restriction Area: Human exposure to aircraft operation hazards is minimized through the establishment of a safety restriction area. The following safety zones are established by the CLUP:

- Clear Zone: From the primary surface, 200 feet beyond the paved runway; extends 1,000 feet outward with an inner width of 250 feet and an outer width of 450 feet
- Approach/Departure Zone: Extends from outer edge of the Clear Zone and centered on the runway centerline; extends 2,000 feet outward with an inner width of 450 feet and an outer width of 850 feet
- Overflight Zone: The general area overflown by aircraft during normal procedures; general area under the horizontal surface that is outside of the Clear and Approach/Departure Zones

The CLUP Height Restriction Areas and the Safety Restriction Areas are shown on Figure 4.4-1. The Noise Restriction Areas are shown on Figure 5-2 in the Noise Section of this Background Report.

In addition to the three safety zones, the CLUP designates the following as incompatible in the Clear Zone and Approach/Departure Zone:

- Any use that would direct a steady or flashing light of white, red, green or amber color toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in a straight final approach toward a landing.
- Any use that would cause sunlight to be reflected toward an aircraft engaged in an initial straight climb following take-off or toward an aircraft engaged in a straight final approach toward a landing.
- Any use that would generate smoke, attract large concentrations of birds or otherwise affect safe air navigation.

4. HAZARDS AND SAFETY

- Any use that would generate electrical interference that could be detrimental to the operation of aircraft or airport instrumentation.
- Any hazardous installations such as: above-ground oil, gas or chemical storage facilities, but excluding facilities for non-commercial, private domestic, or private agricultural use.

As such, the restrictions are centered on the promotion of aircraft safety, the minimization of incompatible land uses and the safeguarding of human health and safety within the plan area.

ENVIRONMENTAL SETTING

Facilities in Colusa County

The primary facility in the Planning Area is the Colusa County Airport, which bears the FAA code OØ8. In addition to the County Airport, the FAA identifies the following private airstrip facilities within the Planning Area:

Name	Relative Location	Lat. / Long.
Antelope Valley	10 miles W of Williams	39-08-46.5N / 122-21-14.8W
Davis	2 miles W of Colusa	39-12-03.61N / 122-02-54.9W
Gunnersfield Ranch	4 miles E of Delevan	39-21-09.6N / 122-05-37.9W
McCabe	3 miles W of Arbuckle	39-00-39.6N / 122-05-51.9W
Moller	1 mile N of Maxwell	39-17-18.6N / 122-11-20.9W
Moronis	3 miles SE of Meridian	39-06-11.6N / 121-51-00.9W
Sanborn	3 miles SE of Meridian	39-06-33.6N / 121-53-01.9W
Williams Gliderport	1 mile NE of Williams	39-09-48.6N / 122-07-53.9W

Colusa County Airport

The County Airport is located just west of SR 45, about two miles south of the City of Colusa. The airport, which is located on ±80 acres, is home to a single paved runway that measures 3,000 feet long. The operations estimate for the airport is approximately 30,000 flights per year. Less than half of the airport's operations consist of general aviation, as the majority of the annual flights are related to agricultural aerial applications (SWCA, 2007). The take-offs and approaches are temporally concentrated in a manner that reflects their agricultural purpose, with the number of aerial application operations reaching a peak around April and June.

The Caltrans Division of Aeronautics *CIP Projects 2008 – 2017* identifies a series of programmed improvements for the Colusa Airport, including a T-hangar project, security fencing and runway rehabilitation. Other improvements include a Super AWOS (All Weather Operating System), rehabilitation of the rotating beacon and updates to the Airport Land Use Plan and Airport Master Plan.

Designated Air Space

The FAA (Order 7400.9S) identifies the following designated airspace for the Colusa County Airport:

AWP CA E5: Colusa County Airport, CA (lat. 39°10'45"N., long. 121°59'36"W.)

That airspace extending upward from 700 feet above the surface within a 6.5-mile radius of the Colusa County Airport. That airspace extending upward from 1,200 feet above the surface

bounded on the east by the west edge of V-23, on the south by the north edge of V-200 and on the west by the west edge of V-195.

National Transportation Safety Board Aviation Accident Database

The NTSB Aviation Accident Database identifies 22 accidents, referred to as “events,” within Colusa County between January of 1970 and August of 2009. Of the 22 events, three resulted in fatalities and the remaining 19 are described as nonfatal. The following tables are recreated from the NTSB data for the fatal and nonfatal events, respectively:

Event Date	Location	Make / Model	Reg. #	Severity
5/13/2007	Colusa, CA	Schweizer G-164B	N3633Q	Fatal (1)
4/14/2001	Williams, CA	Schleicher ASW-20	N47TR	Fatal (1)
5/25/1996	Colusa, CA	Grumman G-164	N48379	Fatal (1)

In the findings for the 2007 and 1996 events, the NTSB determined that the probable cause was failure to maintain proper clearance from power lines. The 2001 event, which involved a non-motorized glider, was determined to be the result of improper aircraft assembly compounded by failure to complete a positive control check.

Event Date	Location	Make / Model	Reg. #
6/30/1999	Williams, CA	Hiller UH-12ET	N7173F
5/19/1995	Colusa, CA	GRUMMAN G-164A	N9830
5/7/1995	Colusa, CA	CESSNA 172A	N7358T
11/13/1993	Colusa, CA	CESSNA 182	N5723B
11/13/1987	Colusa, CA	CESSNA T210M	N761MX
12/18/1985	Arbuckle, CA	CESSNA 152	N4946H
8/22/1981	Colusa, CA	PIPER PA-28	N1005X
6/29/1981	Colusa, CA	GRUMMAN G-164	N7933
6/2/1980	Colusa, CA	AERO COMDR 600S2R	N4017D
5/24/1980	Colusa, CA	CESSNA 150	N22883
4/10/1980	Colusa, CA	CESSNA 150	N6085G
11/16/1979	Colusa, CA	CESSNA 401	N3184K
4/30/1977	Colusa, CA	AERONCA 7AC	N2659E
5/1/1976	Colusa, CA	AERONCA 7AC	N81862
4/27/1976	Colusa, CA	AERO COMDR 600S2R	N4983X
7/6/1975	Colusa, CA	PIPER J-3	N98659
7/6/1975	Colusa, CA	PIPER PA-24	N5924P
9/18/1974	Colusa, CA	BOEING A75N1	N5050V
8/5/1972	Colusa, CA	AERO COMDR A-9B	N7293V

The following summaries are taken from the 22 documented events in Colusa County occurring over the course of nearly 40 years:

4. HAZARDS AND SAFETY

- None appear to have resulted in injuries to individuals on the ground
- ±86 percent (19 events) were nonfatal and about 14 percent (3 events) were fatal
- 22 events is approximately 0.56 events per year (over 39 years)
- Several involved flights with departure points outside of Colusa County
- ±11 were general aviation and ±8 were commercial/aerial application flights

The NTSB data provide brief probable cause descriptions, which are often accompanied by descriptions of any contributing factors. The following table is a general summary of the nature of the probable causes for the 22 events documented within Colusa County:

	Fuel Exhaustion	Pilot Error/Misjudgment	Mechanical Failure	Stall/Mush	Maintenance/Planning
Number of Events	4	6	2	5	5

4.5 HAZARDOUS MATERIALS AND WASTE

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials. There are also naturally occurring hazardous materials in Colusa County such as asbestos and heavy metals.

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

REGULATORY FRAMEWORK

FEDERAL

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties can not be identified

Resource Conservation and Recovery Act (RCRA)

This act established EPA's "cradle to grave" control (generation, transportation, treatment, storage and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

Clean Air Act

Per the Clean Air Act, the EPA has established National Emissions Standards for Hazardous Air Pollutants. Exceeding the emissions standard for a given air pollutant may cause an increase in illnesses and/or fatalities.

Clean Water Act

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the US and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the US. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

STATE

CA Health & Safety Code

Division 20 of the Health and Safety Code establishes DTSC authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a state superfund framework that mirrors the federal program.

Division 26 of the Health and Safety Code establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per federal regulations and charges the Board with meeting Clean Air Act requirements.

Food and Agriculture Code

Division 6 of the CA Food and Agricultural Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

Water Code

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB). In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

CA Code of Regulations

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property

4. HAZARDS AND SAFETY

- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport and disposal of hazardous waste.

Title 26 of the CCR is a medley of state regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation and maintenance of the state's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special and hazardous).

ENVIRONMENTAL SETTING

The EPA Toxic Release Inventory (TRI) identifies the following *On-site and Off-site Reported Disposed of or Otherwise Released (in pounds) for facilities in All Industries for All Chemicals Colusa County*:

Chemical	On-site	Off-site	On & Off-site
Copper Compounds	--	--	--
Styrene	105200	--	105200
<i>Total</i>	<i>105200</i>	--	<i>105200</i>

The CA Department of Toxic Substances Control (DTSC) maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. The following sites are documented within the Colusa County Planning Area:

<i>Envirostor</i>	<i>Site/Facility</i>	<i>Type</i>	<i>Status</i>	<i>City</i>
6070014	Colusa County Fair	Voluntary	Refer: RWQCB	Colusa
6490001	PG&E MGP	State Response	Active	Colusa
6070008	Thayer Aviation	Voluntary	Action Required	Grimes

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the CA Integrated Waste Management Board (CIWMB). The SWIS data, which are updated three times per week, identify active, planned and closed sites. The following facilities and/or sites are identified within the Planning Area:

Number	Name	Activity	Regulatory	Status
06-AA-0002	Stonyford Disposal Site	Solid Waste Landfill	Permitted	Active
06-AA-0003	Maxwell Transfer Station	Large Volume Transfer/Proc Facility	Permitted	Active
06-AA-0024	Premier Mushrooms	Composting Operation (Ag)	Notification	Active

Number	Name	Activity	Regulatory	Status
06-AA-0009	Colusa Industrial Properties	Land Application	Proposed	Planned

Number	Name	Activity	Regulatory	Status
06-AA-0001	Evans Road Landfill	Solid Waste Disposal Site	Permitted	Closed
06-AA-0021	Caltrans/City Colusa DS	Solid Waste Disposal Site	Pre-regulations	Closed
06-CR-0001	Old Williams Dump	Solid Waste Disposal Site	Unpermitted	Closed
06-CR-0003	Maxwell Landfill	Solid Waste Disposal Site	Permitted	Closed
06-CR-0004	Lurline Dump	Solid Waste Disposal Site	Unpermitted	Closed
06-CR-0005	MNF 41-1 Fouts Spgs	Solid Waste Disposal Site	Unpermitted	Closed
06-CR-0006	MNF 41-2 Upper Trough	Solid Waste Disposal Site	Unpermitted	Closed
06-CR-0007	MNF 41-3 Lower Trough	Solid Waste Disposal Site	Pre-regulations	Closed
06-CR-0008	MNF 42-1 Stonyford	Solid Waste Disposal Site	Pre-regulations	Closed
06-CR-0009	Princeton Dump	Solid Waste Disposal Site	Pre-regulations	Closed
06-CR-0010	Grimes Dump	Solid Waste Disposal Site	Pre-regulations	Closed

4. HAZARDS AND SAFETY

Table 4.5-5: CIWMB Closed Facilities/Sites

Number	Name	Activity	Regulatory	Status
06-CR-0011	Arbuckle Dump	Solid Waste Disposal Site	Pre-regulations	Closed
06-CR-0013	Charter Dump South	Solid Waste Disposal Site	Unpermitted	Closed

In addition, the Cortina Band of Wintun Indians has proposed to lease approximately 200 acres of land to a waste management corporation, which would operate a proposed solid waste landfill within the Rancheria. The corporation, Cortina Integrated Waste Management, Inc. (CIWM) would construct and operate the landfill. Initially, the proposed facility would operate at ± 300 tons per day. The tonnage would be increased in phases, to a maximum disposal of 1,500 tons per day. The term of the proposed lease is 25-years, which would include a 25-year renewal opportunity.

Insert Figures:

4.2-1

4.3-1

4.3-2

4.3-3

4.4-1

5. NOISE

This section describes the existing noise environment in Colusa County and is being conducted as part of the overall General Plan Noise Element update.

The Noise Element of the 1989 Colusa County General Plan provides a basis for comprehensive local policies to control and abate environmental noise and to protect the citizens of the County from excessive noise exposure. The fundamental goals of the 1989 Noise Element are as follows:

- To provide sufficient information concerning the community noise environment so that noise may be effectively considered in the land use planning process.
- To develop strategies for abating excessive noise exposure through cost-effective mitigation measures in combination with appropriate zoning to avoid incompatible land uses.
- To protect those existing regions of the planning area whose noise environments are deemed acceptable and also those locations throughout the community deemed noise sensitive.
- To protect existing noise-producing commercial and industrial uses in the Colusa County from encroachment by noise-sensitive land uses.

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

5. NOISE

Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-

state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to Ldn, but includes a +3 dB penalty for evening noise.

Table 5-1 lists several examples of the noise levels associated with common situations.

TABLE 5-1: TYPICAL NOISE LEVELS		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. OCTOBER 1998.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an Leq of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA Ldn as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA Ldn, have generally agreed on the 65 dBA Ldn level as being appropriate for residential uses. At 65 dBA Ldn activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

Department of Housing and Urban Development (HUD). HUD was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA Ldn or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area.
- Exceeding 75 dBA Ldn - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA Ldn is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA Ldn or less, the interior level will be 45 dBA Ldn or less. Thus, structural attenuation is assumed at 20 dBA. However HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependant on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

Existing County Noise Thresholds

The existing (1989) Colusa County General Plan Safety Element includes Table SAFE-3, which identifies the maximum allowed interior noise levels, and the normally acceptable, conditionally acceptable, and normally unacceptable exterior noise levels for the various land use designations in the 1989 General Plan. These noise level thresholds are shown in Table 5-2 below.

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TABLE 5-2: 1989 COLUSA COUNTY SAFETY ELEMENT NOISE/LAND USE COMPATIBILITY

Land Use Category	Recommended Noise Levels, Ldn (dBA)							Interior, MAX
	50	55	60	65	70	75	80	
	Exterior Range							
Residential:								
Low Density								45
Medium to High Density								45
Commercial:								
Hotel								50
Office								55
Restaurant, Retail								60
Other								65
Industrial:								
Light Industrial								55
Manufacturing								50
Other								70
Public/Quasi-Public:								
School, Library, Church, Hospital, Theater								45
Other								55
Open Spaces:								
All Categories								--

Key:



Normally acceptable

Specified land use is acceptable, assuming standard building construction.



Conditionally Acceptable



NORMALLY UNACCEPTABLE

Standard building construction is not adequate for specified land use; however, mitigation measures may be easily employed to reduce noise to acceptable levels. An analysis of the measures by a qualified acoustical professional is required, to be approved by the County.

The specified land use should be discouraged unless the County finds the project to be in the public interest and a detailed analysis by a qualified acoustical professional shows that specific measures which are to be included in the project would reduce indoor and outdoor noise to acceptable levels. The analysis and attenuation measures must be approved by the County.

SOURCE: COLUSA COUNTY GENERAL PLAN SAFETY ELEMENT, 1989.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the General Plan study area. Day/night traffic distribution for Interstate 5, State Route 20, and State Route 45 were based upon continuous hourly noise measurement data collected for these roadways. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 5-3 shows the results of this analysis.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 5-3 are generally considered to be conservative estimates of noise exposure along roadways in Colusa County.

TABLE 5-3: PREDICTED EXISTING TRAFFIC NOISE LEVELS

Roadway	Segment	Noise Level at 100 feet, Ldn	Distances to Traffic Noise Contours, Ldn (feet)		
			70 dB	65 dB	60 dB
I-5	South of Arbuckle	79.1 dB	405	873	1881
I-5	Arbuckle to Williams	79.5 dB	432	931	2005
I-5	North of Williams	78.6 dB	375	807	1739
SR 20	East of Colusa	69.0 dB	86	185	398
SR 20	Colusa to Williams	64.2 dB	41	88	190
SR 20	West of Williams	65.6 dB	51	109	236
SR 45	South of SR 20	62.3 dB	30	66	141
SR 45	North of Colusa	60.3 dB	23	49	105
SR 16	Lake County Line	56.5 dB	13	27	58
Wildwood Road	South of Hillgate Road	58.8 dB	18	39	84
Hillgate Road	Wildwood to Cortina School Rd.	57.2 dB	14	30	65
Cortina School Road	Hillgate Rd. to Hahn Rd.	54.9 dB	10	21	45
Hahn Road	Lone Star to Grimes-Arbuckle	57.1 dB	14	30	64
Grimes-Arbuckle Road	Hahn Rd. to Tule Rd.	55.1 dB	10	22	47
Tule Road	Grimes-Arbuckle to Poundstone	58.9 dB	18	39	84
College City Road	North of White Rd.	58.0 dB	16	34	74
Lone Star Road	Myers Rd. to Abel Rd.	60.4 dB	23	49	106
Abel Road	East of Lone Star Rd.	56.1 dB	12	25	55
Lone Star Road	Abel Rd. to SR 20	60.0 dB	22	47	101
Zumwalt Road	Myers Rd. to Walnut Drive	57.3 dB	14	30	66

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TABLE 5-3: PREDICTED EXISTING TRAFFIC NOISE LEVELS

Roadway	Segment	Noise Level at 100 feet, Ldn	Distances to Traffic Noise Contours, Ldn (feet)		
			70 dB	65 dB	60 dB
Walnut Road	West of Zumwalt Drive	59.4 dB	20	42	91
Zumwalt Road	North of Walnut Drive	59.3 dB	19	42	90
Freshwater Road	West of I-5	55.4 dB	11	23	49
Wilson Avenue	North of SR 20	54.9 dB	10	21	46
Lurline Avenue	SR 45 to I-5	62.2 dB	30	65	141
Maxwell Sites Road	East of McDermott Road	59.3 dB	19	42	90
Maxwell Road	I-5 to Four Mile Road	61.7 dB	28	60	129

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.
SOURCE: FEHR & PEERS TRANSPORTATION ENGINEERS, CALTRANS, J.C. BRENNAN & ASSOCIATES, INC., 2009.

Railroad Noise Levels

Railroad activity in Colusa County occurs along the California Northern Railroad Company (CFNR) line which parallels the Interstate 5 corridor through the communities of Arbuckle, Maxwell, and Williams. The line extends from the Union Pacific Railroad (UPRR) junction in Davis to the UPRR junction in Tehama.

The CFNR line is used to haul lumber, beverage products, food products, steel pipe, agricultural products and construction material. The line is also currently being use to haul major components for the Colusa Generating Station under construction by PG&E in Colusa County.

In order to quantify noise exposure from existing train operations, a continuous (24-hour) noise level measurement survey was conducted. The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations, while accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events, so that the typical number of train operations could be determined.

Locations of continuous noise monitoring sites are shown on Figure 5-1. Table 5-4 shows a summary of the continuous noise measurement results for the CFNR line.

TABLE 5-4: RAILROAD NOISE MEASUREMENT RESULTS

Measurement Location	Railroad Track	Grade Crossing /Warning Horn	Trains Events Per 24-hr period	Distance to CL	Average SEL
Site C	CFNR	Yes	3	243'	99.4 dB

SOURCE: J.C. BRENNAN & ASSOCIATES, INC - 2009

Noise measurement equipment consisted of a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter equipped with a LDL ½" microphone. The measurement system was calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Based upon the noise level measurements shown in Table 5-4, the average SEL for train operations along the CFNR line was 99.4 dB at a distance of 243 feet from the track centerline, with approximately three train events occurring during daytime hours.

To determine the distances to the day/night average (Ldn) railroad contours, it is necessary to calculate the Ldn for typical train operations. This was done using the SEL values and above-described number and distribution of daily freight train operations. The Ldn may be calculated as follows:

$$\text{Ldn} = \text{SEL} + 10 \log N_{\text{eq}} - 49.4 \text{ dB, where:}$$

SEL is the mean Sound Exposure Level of the event, N_{eq} is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day, plus 10 times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the Ldn value for railroad line operations have been calculated, and the distances to the Ldn noise level contours are shown in Table 5-5.

TABLE 5-5: APPROXIMATE DISTANCES TO THE RAILROAD NOISE CONTOURS			
Ldn at Measurement Site	Distance to Ldn Contour		
	60 dB	65 dB	70 dB
UPRR line			
54.8 dB @ 243 feet	109'	51'	23'

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. 2009.

Aviation Noise Levels

The Colusa County Airport is the only general aviation facility in the County. The Airport is located at 2915 State Route 20, south of the City of Colusa. The airport is operated by the Colusa County Board of Supervisor's Office. The airport's single paved runway is 3,000 feet in length and 60 feet wide.

The most recent estimate of annual operations is 28,000-30,000 flights per year. Thirty-three aircraft are currently based at the airport. A major portion of airport operations are a result of agricultural aircraft involved in crop dusting activities.

Noise Impacts and contours associated with the Colusa County Airport are addressed in the *Colusa County Airport Comprehensive Land Use Plan*, Adopted by the Colusa County Airport Land Use Commission on June 5, 1995. Figure 5-2 shows the most recent noise contours developed for the airport.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

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1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields.

There are various agricultural/industrial facilities distributed throughout the County. Many of the facilities are associated with agricultural processing and/or crop storing and have seasonal peaks in operations. The following is a list of some of the various agricultural and industrial noise sources in the County.

DE PUE WAREHOUSE COMPANY

De Pue Warehouse Company operates 11 rice drying and/or storage facilities in the unincorporated areas of Colusa County. Their peak operations typically occur from the end of August through October. During peak operations continuous operation of blowers occur for those facilities with rice drying operations. The De Pue Warehouse facilities are located at:

- 6160 County Road 71 – Delevan
- 3334 Highway 99W - Williams
- 4854 Highway 99W - Delevan
- 5656 Haas Road - Williams

- 61576 Maxwell-Colusa Road - Maxwell
- 3248 Danley Road - Williams
- 1 Comet Lane - Maxwell
- 1206 Husted Road - Williams
- 5999 Freshwater Road - Williams
- 48 Maxwell-Colusa Road – Maxwell
- 5228 Farview Road – Maxwell

At the time that noise measurements were collected for this report, rice dryers were not in operation at any of the De Pue Warehouse facilities. However, a study at the Cargrill Rice Dryers in Grimes was performed in February, 1987. Noise level were measured with the blowers on and off for short time periods. The results are summarized in Table 5-6.

TABLE 5-6: RICE DRYER NOISE LEVELS		
Distance from the Blowers, feet	Noise Level with Blowers on	
	Leq	Ldn*
50'	77.5 dB	83.9 dB
100'	71.5 dB	77.9 dB
150'	69.0 dB	62.6 dB
200'	66.0 dB	72.4 dB
500' (75' South of Hwy 45)	61.5 dB	67.9 dB
	Noise Level with Blowers off, (Leq)	
400' (Highway 45)	54.0 dB	

* ASSUMES CONTINUOUS OPERATION FOR 24-HOURS.

SOURCE: COLUSA COUNTY GENERAL PLAN SAFETY ELEMENT, 1995 & J.C. BRENNAN & ASSOCIATES, INC. 2009

Based upon the data contained in Table 5-6, the 60 dB Ldn noise contour would be located approximately 1,242 feet from the rice dryer measured in Grimes, or for similar rice dryers located in the County.

ADM RICE

Archer Daniels Midland Company (ADM) operates a large processing facility at 1603 Old Highway 99 W. in Arbuckle. No specifics about ADM operations are available as representatives from ADM were unavailable during preparation of this report.

WESTERN MILLING

Western Milling operates a storage and drying facility at 540 Main Street in Grimes. Their primary function is to store grains prior to processing/milling. Their peak operations occur during July through October. During rice harvest they operate rice dryers. A representative of the company estimates that they receive approximately 50 truck shipments daily during peak operations.

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MORNING STAR PACKING

Morning Star Packing is located on the southern boundary of the City of Williams. However, noise exposure from the facility could affect properties in the County.

Morning Star Packing produces various tomato products including tomato paste, diced tomatoes, ground tomatoes, chili sauce, ketchup, and various custom products. The plant operates 24/7 during summer months from approximately July through October. Trucking operations are also a 24/7 operation and a representative of the company estimates that they receive approximately 550 truck shipments per day. During the off-season the facility operates from 6:00 am to 10:00 p.m.

A noise measurement of the Morning Star Packing plant operations was conducted at a distance of 1,500 feet from the main plant during operation on August 21, 2009. The plant generated noise levels of 59.8 dB Leq at this distance. Assuming continuous operation, this would result in a noise level of 66.2 dB Ldn over a 24-hour period, after application of nighttime penalties. Based upon this value, the 60 dB Ldn noise contour would be located approximately 3,062 feet from the packing plant.

TRANSFER STATION

Norcal Waste operates the Maxwell Transfer Station at 3840 Old Highway 99 W in Maxwell.

The hours of operation for the transfer station are:

- 8:30 am – 3:00 pm Monday-Friday
- 9:00 am – 2:00 pm 1st and 3rd Saturdays

Noise level measurements conducted at transfer stations indicate that typical hourly average noise levels range between 60 dB Leq and 70 dB Leq at a distance of 50 feet from the transfer station building. The primary noise sources included fork-lifts, truck traffic, front-end loaders, balers and sounds of material dumping onto the floor. Measured noise levels, where the buildings were enclosed were approximately 20 dB to 25 dB less than the sides of the buildings which were open to activities.

Based upon the typical eight weekday hours of operation, the noise exposure from the transfer station could range between 55-65 dB Ldn at a distance of 50 feet from the main transfer station building. The 60 dB Ldn noise contour would be located approximately 90 feet from the transfer station building.

POWER PLANT

The Colusa Generating Station is currently under construction in Colusa County. The power plant is located approximately four miles west of Interstate 5 and six miles north of the community of Maxwell. The 660-megawatt (MW) natural gas-facility is expected to be online by November of 2010.

The California Energy Commission (CEC) conducted a review of noise impacts associated with the Colusa Generating Station. According to the CEC review, the project will be required to limit the noise exposure from the facility to 40 dB Leq at a distance of 9,000 feet southeast of the power plant, at the location of the nearest sensitive receptor. Northeast of the power plant, noise levels will be limited to 38 dB Leq, at a distance of 12,000 feet.

Based upon a noise level of 40 dB Leq at 9,000 feet and continuous operation of the power plant, the distance to the 60 dB Ldn noise contour for the plant is estimated to be 1,880 feet from the power plant.

COMPRESSOR STATION

The existing PG&E Delevan Compressor Station is located immediately east of the new Colusa Generating Station. The natural gas compressor station is one of four compressor stations that move approximately two million cubic feet of gas daily along the 400-mile PG&E gas line from the Oregon border to Central California and the San Francisco Bay area.

The station has three enclosed gas-driven compressor units ranging in horsepower ratings from approximately 9,250-14,000 hp. According to PG&E, two of the gas-driven units will be upgraded to electric motor-driven compressors.

Based upon observations conducted near the Delevan Compressor Station on August 21, 2009, each of the compressors were fully enclosed in buildings and noise exposure was minimal.

NATURAL GAS WELL SITES

There are numerous natural gas well sites located in Colusa County. Many of the well sites have permanent compressors located at the wells for pumping the gas into the distribution system. A noise measurement of a natural gas compressor station located at Grimes-Arbuckle Road and Lodi Road was conducted. The compressor station generated steady noise levels of 66 dB Leq at a distance of 100 feet from the compressor system. The 60 dB Ldn noise contour would be located approximately 417 feet from the compressor station.

AGRICULTURAL PEST DETERRENTS

The use of auditory type agricultural pest deterrents was observed at various locations in the County. One of the most common types of auditory type bird deterrents is the propane cannon. An example of a propane cannon is the ZON Gun which produces a periodic loud explosion, based upon a timer setting. Its primary use is to frighten birds and to prevent them from feeding in the agricultural fields.

Short-term noise level measurements of a ZON gun were conducted to quantify individual 'firings' of the gun. The ZON Gun was found to fire once every three minutes. The gun can be set to produce anywhere from 100 to 125 dB at the muzzle. Table 5-7 shows a summary of the short term noise measurement results.

TABLE 5-7: SHORT-TERM EVENT NOISE LEVELS

Location	Description	Distance (ft)	Time	Sound Measurements (dBA)	
				SEL	Lmax
Side Exposure	ZON Gun	40	9:02 a.m.	93	94
Front Exposure	ZON Gun	100	9:08 a.m.	85	86

SOURCE: J.C. BRENNAN & ASSOCIATES, INC., 2009

Based upon the data shown in Table 5-7, the resulting hourly Leq can be calculated using the following equation:

$$\text{Leq} = \text{SEL} + 10 \log \text{Neq} - 35.6, \text{ dB where:}$$

SEL is the mean SEL of the event, Neq is the sum of the number of hourly events, and 35.6 is 10 times the logarithm of the number of seconds in an hour.

Assuming 20 events per hour, the hourly Leq at a distance of 100 feet would be 62.4 dB. Continuous operation of the propane cannon would result in noise levels of 68.8 dB Ldn, after application of

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nighttime penalties. The 60 dB Ldn noise contour would be located approximately 275 feet from the air cannon.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the County.

Short-term noise measurements were conducted at eight locations throughout the County on August 19-21, 2009 during daytime and nighttime periods. In addition, five continuous 24-hour noise monitoring sites were also conducted throughout the County to record day-night statistical noise level trends. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 5-8 and Table 5-9. Figure 5-1 shows the locations of the noise monitoring sites.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 and Model 824 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

TABLE 5-8: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS

Site	Location	Ldn (dBA)	Measured Hourly Noise Levels, dBA					
			Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm - 7:00 am)		
			Leq	L50	Lmax	Leq	L50	Lmax
A	4827 Old Highway 99, Delevan - Backyard	62	52-63	46-58	61-93	52-59	51-58	63-75
B	368 Commercial / SR 45, Princeton - Frontyard	61	53-61	45-55	74-87	46-60	38-50	71-80
C	74 Olive Street, Maxwell - Frontyard	62	54-69	50-53	72-99	47-59	46-53	63-79
D	5005 SR 20, Williams – 90 from Centerline	66	59-71	44-65	75-87	53-62	37-48	76-83
E	6833 Grimes-Arbuckle Rd, Frontyard	61	55-61	43-56	71-85	50-58	46-51	66-78

SOURCE – J.C. BRENNAN & ASSOCIATES, INC. - 2009

TABLE 5-9: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

Site	Location	Time ¹	Measured Sound Level, dB			Notes
			Leq	L50	Lmax	
1	Sites – Huffmaster Rd, South of Sites-Lodoga Rd.	1:34 p.m.	40	36	52	Cricket/bug noise
		1:16 a.m.	45	45	49	Slight breeze
2	Delevan – Delevan Rd. & Corbin Rd.	3:57 p.m.	53	37	75	Car passby on Delevan Road, bird deterrent guns
		12:50 a.m.	50	48	62	Distant I-5, bird deterrent guns
3	Williams – Zumwalt Rd. & Crawford Rd.	2:40 p.m.	62	47	81	Traffic, farm equipment from orchards, distant I-5 traffic
		12:26 a.m.	47	47	56	Distant I-5 traffic
4	Colusa – South side of Moonbend Rd.	12:12 p.m.	56	39	78	Distant SR 20 traffic, tractor, bird deterrent guns
		11:02 p.m.	43	42	49	Distant SR 20 traffic, bird deterrent guns
5	S.R. 16 – South of SR 20 at BLM Campground	4:43 p.m.	50	36	69	Vehicle passbys on SR 16 (2)
		1:59 a.m.	38	38	39	Cricket/bug noise
6	Arbuckle – Grimes-Arbuckle Rd. & 1 st Street	1:36 p.m.	63	51	80	Traffic noise, trucks
		12:08 am.	63	56	80	Traffic noise, trucks
7	College City – Main St. & 9 th St.	1:16 p.m.	54	41	71	Traffic on Main, sprinklers
		11:52 p.m.	44	44	52	Distant I-5, crickets
8	Grimes – 2 nd St. & Poundstone St.	12:44 p.m.	56	45	74	Traffic, blower at commercial use, parking lot noise
		11:29 p.m.	55	45	67	Traffic on Main, industrial hum in distance

1 - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE TEST DURATIONS OF 10:00 MINUTES.

SOURCE - J.C. BRENNAN & ASSOCIATES, INC. 2009.

The results of the community noise survey shown in Table 5-8 and 5-9 indicate that existing transportation noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys. However, some of the more rural locations do not experience frequent vehicle activity so background noise levels are correspondingly low.

Agricultural noise was observed to contribute to the background noise environment in some locations, especially where propane cannons were used to deter bird pests. Additionally, a significant amount of trucking activity was observed corresponding to harvesting and general agricultural activities.

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Insert Figures:

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6. CONSERVATION AND NATURAL RESOURCES

The County’s natural resources form an important part of the County’s unique character. In an effort to identify and understand the key natural resources of the County, this chapter is divided into the following sections:

- Cultural Resources (6.1)
- Biology and Natural Resource Lands (6.2)
- Hydrology and Water Quality (6.3)
- Scenic Resources (6.4)
- Air Quality (6.5)

6.1 CULTURAL RESOURCES

Cultural Resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the County’s cultural heritage should be considered when planning for the future.

KEY TERMS

Archaeology. The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

Paleontology. The science of the forms of life existing in former geologic periods, as represented by their fossils.

Ethnography. The study of contemporary human cultures.

Complex. A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

Midden. A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

REGULATORY SETTING

FEDERAL REGULATIONS

National Historic Preservation Act

Most regulations at the federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of

Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

STATE REGULATIONS

California Register of Historic Resources (CRHR)

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

California Environmental Quality Act (CEQA)

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historical Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In

order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

State Laws Pertaining to Human Remains

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Senate Bill 18 (Burton, Chapter 905, Statutes 2004)

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places (“cultural places”) through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §65352.4, and §65562.5 to the Government Code; also requires the Governor’s Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments for how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

LOCAL

Colusa County General Plan

The existing Colusa County General Plan contains the following policies related to the protection of cultural and historical resources:

CO-22 The preservation and re-use of historical sites and structures in the county should be encouraged.

CO-23 The county should apply for landmark status or national register listing for any historical sites which may be eligible.

6. CONSERVATION AND NATURAL RESOURCES

CO-24 The county shall encourage and cooperate with cities, special districts, state and federal agencies, and private landowners in acknowledging and preserving the county's cultural heritage, historical and archaeological structures, sites, and landmarks.

CO-25 An archaeological survey should be required prior to approval of any project which would require excavation in an area known to contain archaeological resources.

PREHISTORY

Archeology tells us that by at least 6,000 years ago, about 4000 B.C., Native Americans were living along the Sacramento River in Colusa County. Ten to twelve feet below the modern surface was a "buried midden" dated to 4020 B.C. that was discovered and dated, but not further investigated (White 2003a, 2003b). Midden is the remains of plants and animals, like a compost pile, usually with bits of artifacts too, left by a group who generally call the place home. Village sites have midden, temporary camps normally do not.

After 2500 B.C., archeologists do have a record of life at this village with various artifacts recovered including stone points designed to be used with a spear-thrower (atlatl), fishing related items, bone and stone tools, and shell ornaments (Rosenthal et al. 2007:154). By this time, archeologists feel this village site was occupied year-round (White 2003a, 2003b). Colusa County looks to have had its first "town" about 4,500 years ago. Other early settlements along the river may also exist, although they are not yet discovered.

At about 1000 A.D., the bow and arrow was introduced into the area and new opportunities opened up for the hunter. Fishing technology also continued to improve during this period, and, not surprisingly fish remains make up increasingly larger percentages of food remains found at river side villages from this period onward (Rosenthal et al. 2007:160). The collection of the local wild seed crop, supplementing the diet of acorn, a staple since about 500 B.C., also increased during this time. Over time, the size of certain types of seeds collected became larger, leading some to suggest that the foundations of horticulture were beginning to take root in California's Central Valley (Rosenthal 2007:159).

Populations at the villages along the river continued to expand, and by the time of first written records, a village with three or four thousand residents was not uncommon, particularly at a good fishing spot where weirs could be constructed. Such was the case at Coru, "one of the largest (villages) in the valley," according to Bidwell who first saw it in 1843. Coru was probably selected as the primary settlement in the area for two principal reasons, it did not flood, a fact discovered by Bidwell when he used a canoe to travel there from Sutter's ranch (Sacramento) during the winter of 1844 without having to bother with portage and it had a great spot for a fish weir.

ETHNOLOGY

Patwin

The Patwin occupied the southern Sacramento Valley west of the Sacramento River from just north of the town of Princeton (or possibly as far north as Hamilton City), south to just below Colusa, south to San Pablo and Suisun bays. In the historic literature, they are often referred to as the Colus. Patwin territory extended approximately 90 miles north to south and 40 miles east to west. Distinction is made between the River Patwin, who resided in large villages near the Sacramento River, especially between Colusa and Knights Landing, and the Hill Patwin, whose villages were situated in the small valleys along the lower hills of the Vaca Mountains and Coast Range, with concentrations in Long, Indian, Bear, Capay,

Cortina and Napa valleys (Johnson 1978:350; Powers 1877:218). The term “Patwin” refers to the people belonging to the many small contiguous independent political entities in this area who shared linguistic and cultural similarities. Hill and River Patwin dialects are grouped into a North Patwin language, separate from South Patwin, spoken by people who live near present-day Knight's Landing and Suisun. Together, these are classified as southern Wintuan and belonging to the Penutian language family as do the languages of the Miwok and Costanoan peoples (Johnson 1978:350. 359, Kroeber 1925:351-354).

Politically, the Patwin were organized in small tribes or tribelets, each consisting of a primary village with satellite villages. Tribelets were autonomous and differed from other such units in minor cultural variations. Dialects might encompass several tribelets. Territories were vaguely defined, but included fishing and gathering areas used by the group. In each village, the leader or chief administered subsistence ventures, such as hunting or gathering, and presided over ceremonies. Social and economic activities were divided among families within a village, with certain families responsible for different specialties such as trapping ducks, collecting salt, making foot drums, or performing particular dances or shamanistic rituals (Johnson 1978:354-355).

Natural resources flourished in Patwin territory. They gathered seeds and plant foods and hunted game animals on the plains, shot or netted ducks and other migratory water fowl in the thick tule marshes, and netted salmon and other fish in the rivers and streams. Some of these activities were conducted by groups or families assigned to particular resource areas by a village chief. Acorns were a staple in the Patwin diet. Two types of Valley oak and rarely, live oak acorns, were gathered at communally-owned groves (Johnson 1978:355). To obtain salt, the Patwin scraped off rocks that were found near Cortina, burned a grass that grew on the plains, or obtained it in trade from the neighboring Pomo (Johnson 1978:355).

King salmon, silver salmon and steelhead trout that run from the ocean to freshwater rivers and streams were an important diet item. Explorers observed Patwin fishing for salmon with a boom net in 1854 (Heizer and Elsasser 1980: Figure 37). The Patwin also caught smaller fish and collected mussels from the river bottom. They attracted wild ducks by setting out realistic decoys, and drove the fowl into large nets stretched above the marshes. Hunters also netted mud hens, geese and quail. The Suisun tribelet pursued waterfowl in tule rafts (Powers 1877:220). The Patwin hunted large game, such as tule elk, deer, antelope and bear, and took many varieties of small animals, reptiles, insects and birds either to eat or to use for ceremonial and practical materials (Johnson 1978:355).

Ko-ru (Coru) was the tribal capital of the Ko-ru-si band of Patwin, and the village site sits underneath the community of Colusa. There were at least thirteen related villages situated north and south of *Ko-ru* along the Sacramento River from near the confluence with Sycamore Slough on the south to just north of Princeton. *Ko-ru* was abandoned after the epidemic of 1832, as the place was considered unhealthy. The new primary village of the River Patwin was established on the east side of the river across from the former “capital” (McComish in McComish and Lambert 1918:39).

Northeastern Pomo

The territory around Big Stony Creek, Salt Creek, and Snow Mountain including Stonyford belonged to a branch of Pomo-speakers identified as the Northeastern Pomo. Seven distinct and mutually unintelligible language divisions existed within this Pomoan language family, some more divergent than German and English (McLendon and Oswald 1978:274). The seven groups identified by linguists are: the Southeastern, Eastern, Northeastern, Northern, Central, Southern, and Kashaya Pomo.

6. CONSERVATION AND NATURAL RESOURCES

There was one principal settlement that housed a chief recognized by all group members. Other subsidiary villages were linked by political ties to the main community. All members of a group were at liberty to hunt, fish, and gather wild foods. Territorial boundaries were definite and property rights were established. In times of resource abundance, these rights could be, and were relaxed, allowing mutually acceptable freedom of land use. In general, Indians of the region were peaceful and relationships were amicable among the diverse peoples. Feuds and wars are known from stories and legends, but these battles do not appear to be of major consequence (Kroeber 1925:228-229).

The village of “*ba kam*” or “chaparral village” was located along Big Stony Creek, above the junction with Little Stony Creek. This village center controlled an important and valuable resource, salt. The main collection spot located along Salt Creek was called “*ch e e ti do*” or “salt field.” Payment was expected for either the product or access to the collection spot, and the lack of such, resulted in the so-called “Salt Wars” in the early nineteenth century (McLendon and Oswalt 1978:286).

Individual status was very important to both men and women in Pomo society, and involved a complex interaction of family status, background, wealth, and individual achievement. In contrast with many California tribes, the Pomo had the concept of “ownership” of particular areas for purposes of resource procurement, if not the European idea of unrestricted ownership of land parcels. Also, the Maru society and later the ghost society, along with kin relationships, were pervasive throughout the society (Meighan and Riddell 1972). For instance, membership in a profession, a way of gaining status, required sponsorship and tutoring by a family member already in the profession. Membership in a secret society also required sponsorship from a family member. Professions included chieftanship, shamanic roles, and specialized manufacturers (Loeb 1926).

The Northeastern Pomo hunted antelope, deer, and elk. This task either performed individually or communally, was one of the most important occupations of the men. Other animals they hunted include rabbits and squirrels. In addition to animals, they also relied on acorns, buckeye nuts, berries, and roots and bulbs. Like their neighbors, the Hill and River Patwin, various insects such as grasshoppers, caterpillars, and larvae provided an additional source of protein (Bean and Theodoratus 1978:290).

HISTORIC PERIOD BACKGROUND

John Bidwell, a Native American co-worker, Peter Lassen, and “a German named Joe Bruheim” swiftly proceeded north to catch up with the immigrant party and crossed into Colusa County in March 1843 and left us with the first written account. As Bidwell recalled, “In my chase for stolen horses I had come across a country that was to me a revelation. And as I proceeded up the valley, through what was later Colusa County, and beyond it, I was struck with wonder and delight in this almost interminable land of promise” (Bidwell in Rogers 1891:45).

Bidwell described the Patwin village at Colusa as one of the largest in the valley. He describes, “many other villages in the vicinity (of Colusa) on both sides of the river both above and below the Colus village,” and estimates, “I can truthfully say that the number of Indians within ten miles numbered not less than fifteen or twenty thousand” (Bidwell in Rogers 1891:41).

The first settler to build a home in the county was John S. Williams. Williams worked for Thomas Larkin. Larkin’s children had been awarded a Mexican Land Grant and both fulfill his obligations under the terms of the land grant and to keep squatters from settling on his new holdings, Larkin sent Williams in 1846 to build a home and establish a ranch. Larkin supplied a herd of 800 head of cattle to Williams on shares (Green in Rogers 1891:79; McComish in McComish and Lambert 1918:27). Williams, his wife, and

his herd of cattle headed north during the summer of 1847 and set up headquarters on the west side of the river about a mile and half south of Princeton (McComish in McComish and Lambert 1918:27).

Robert Semple had first visited Colusa County in 1847 during a trip to the Red Bluff area to visit friends. He rode up the valley along the west bank of the Sacramento River. According to McComish (in McComish and Lambert 1918:26), “The luxuriance of the vegetation in the vicinity of the Colus Indian village convinced him that here would be a good place for a settlement.” When Robert’s brother Charles arrived at Benicia from Kentucky in 1849 in his party were: another brother, John; one of Robert’s sons; a cousin, Will S. Green; and, James Yates (Green in Rogers 1891:347). Charles (Colonel) Semple had been talked into his brother’s scheme concerning building a town on the site of the Colus village at Salmon Bend, and bought 8,875 acres from John Bidwell in 1850. In the spring of 1850, Colonel Semple and a group of workmen came up the valley to establish a town and a landing along the river. The Colonel got it wrong and ended up about seven miles north of Coru at another village.

Semple quickly discovered his mistake and headed south. When they arrived, they found that other had beaten them to the site. Before Semple arrived, one other business in town was already in operation, and a residence was under construction. The future town of Colusa’s first business was, “...a little shanty on what is now Fifth Street, between the Riverside Hotel and the river” (McComish in McComish and Lambert 1918:52).

The settlement of Colusa prospered during the 1850s due to its location along two major transport and trade routes; the Sacramento River and an increasingly important land based route to the northern mines known as the Old River Road. Steam-powered boats, not unlike those plying the Mississippi during the same period, regularly navigated up and down the Sacramento River and Colusa County alone had at least five named landings where goods were exchanged in addition to the communities of Princeton, Colusa and Grimes which would eventually serve as major shipping points.

The hill country in the western part of the county saw the first settlers in 1852, two or three unnamed cattle ranchers, who had small herds roaming Spring Valley. Antelope Valley had four settlers by 1853, including John Sites (McComish in McComish and Lambert 1918:37). Bear Valley’s first resident was Godfrey Ingram who arrived in the fall of 1853.

The so-called “plains” between Colusa and the foothills to the west were settled slowly beginning in about 1853 starting with the area along the sloughs and creeks near Williams, Arbuckle and College City. The area around Maxwell and Delevan wouldn’t be inhabited by much other than cattle herds for additional ten or twelve years (Lambert 1918:58). Green (in McComish and Lambert 1918:58) states, “North of a due west line from Colusa there were no settlements on the plains, for agricultural purposes, until about 1868.”

W.H. Williams arrived on the plains in 1854 in the area where the future town bearing his name would be established to experiment with raising wheat and barley, something he had tried the year before in nearby Spring Valley (Rogers 1891:86; McComish and Lambert 1918:58). A year later, in 1855, Andrew Pierce settled near what would become College City, and the Weyand brothers, Gustav and Julius, put down roots near what would become Arbuckle (McComish and Lambert 1918:59).

Farmers were not the only ones arriving on the plains during this period. J.C. Stovall who arrived in 1858 and settled down with his herd six miles west of Williams. Stovall teamed up with another rancher to form the Stovall-Wilcoxson Company, who within sixty years, owned a thirty-five thousand plus acre ranch west of Williams.

6. CONSERVATION AND NATURAL RESOURCES

The 1850s saw the transition in the county from a ranching and trade based economy to one that increasingly included more intensive agriculture. Water for grain crops was weather dependant: with adequate rains, they prospered; without, failure. The years from 1850 to 1851 and 1854 to 1857 were so dry that it was reported that, "...most who had located on the plains pulled up stakes and turned their backs on its desolation and aridity." Another insult came in the form of a massive swarm of grasshoppers in 1855 which, "...ate up the pasturage, destroyed the oats and killed many of the trees" (Rogers 1891:75).

1876 was a pivotal year, with the "Northern Railway" tracks and construction locomotive reaching and entering southern Colusa County. The group continued laying tracks to the north without delay. Within ten days, "Arbuckle laid out, and the work of track laying to the place having been completed, a general jollification followed" (Rogers 1891:152).

Other landowners along the proposed Northern Railroad route wasted no time in capitalizing on their luck. As Roger's (1891:150) notes, several months before the railroad reached the county, "W.H. Williams, after laying out the town of Williams, circulates nicely-executed maps of the place." By June 23rd, railroad cars had reached the new community and, "In celebrating the event a great quantity of powder was burned, flags were hoisted, bunting fluttered everywhere, and the day closed with a dance" (Rogers 1891:152).

Both Williams and Arbuckle grew quickly as the Northern Railroad line was extended northward. By September 11th of that year, Arbuckle already had a post office, with T.R. Arbuckle in charge and, "the town of Willows being laid out, town lots selling rapidly" (Rogers 1891:154). By April 1877, Maxwell had also grown sufficiently to have opened a post office.

In less than a year after celebrating the arrival of the railroad, an exploding lamp caused a fire in the commercial district in Williams, destroying the Odd Fellows Hall, a general store located on the lower floor, a nearby livery stable, a wagon shop and a blacksmith shop (Rogers 1891:157).

The Northern Electric Railway Company was reorganized in 1918 as the Sacramento Northern Railroad Company. Their combined main line from Chico to San Francisco ran 185 miles and was the longest interurban railway line in North America. Although the Sacramento Northern expanded its passenger service by purchasing the San Francisco-Sacramento Railroad in 1928, the competition with automobile, bus and truck traffic took its toll. By the mid-1930s passenger traffic on the Sacramento to Chico route had been drastically reduced. The financial stability of the company was further impacted by the Depression economy, and natural disasters such as windstorms and flooding disrupting service and damaging facilities. The completion of the Bay Bridge in 1939 brought an end to the interurban passenger service. In 1940, the company completely abandoned passenger service.

It was not until 1916 that a good concrete road was built connecting Colusa and Williams. With the road paralleling the railroad, one could finally drive between Colusa, Williams, Arbuckle and Maxwell without having to leave the concrete surface. Within a few years, the north/south road (later State Route 45), connecting Princeton, Colusa, and Grimes, was improved as well. It would take many additional years to get a good, year-round surface on the various secondary roads. Roads and bridges cost money, and passing bond measures to pay for the improvements had a mixed record of success.

By 1926, the road paralleling the Southern Pacific railroad was officially designated at Highway 99W. Beginning in Sacramento at the 'I' Street Bridge, Highway 99W followed the west side of the river up to the valley to eventually meet and merge with the Highway 99E branch at Red Bluff. In the early 1960s,

construction began on a new interstate highway system, Interstate 5, and when “I-5” was completed, Highway 99W was relegated to a frontage road. Many businesses had developed in Arbuckle, Williams, and Maxwell to serve the travelers along Highway 99W, and it is not difficult to find survivors in each of these communities today.

In 1887, California passed the Wright Irrigation Act that authorized and regulated the formation of irrigation districts. On November 22, 1887 the Central Irrigation District was formed, incorporating 156,500 acres (McComish in McComish and Lambert 1918:227). It took nearly thirty years, and a number of different investors, but with the completion of the canal structure and the pumping facilities, the county could support its newest cash crop, rice. Rice had created a new demand for large quantities of water and the irrigation districts would supply it. In addition to the canal's completion, large individual pumping plants were installed for the new water-hungry rice crop on the Charles H. Glenn Farm and the Mudd Ranch and a second plant was installed on the Sacramento River at Sidde Landing.

Prior to widespread irrigation, the primary agricultural export could be summed up with one word - wheat. Farms of enormous size developed. The Glenn Ranch, then in the northern part of the county, at one time encompassed over 50,000 acres of land devoted to wheat (Rogers 1891:137). Farms several thousands of acres in size were not uncommon, and even today, the average size farm in the county is roughly 560 acres in size.

CULTURAL RESOURCES IN COLUSA COUNTY

There are 616 recorded cultural resources in Colusa County. These resources represent a cross section of previous human activity. From a fragment of a handstone used to mill seeds during the prehistoric period to one of the many historic period homes and businesses in the City of Colusa, the 616 resources record the imprint left by the unique variety of people who have made the county their home or helped it prosper.

The list will continue to grow as archeologists study new areas. Many of the 616 resources are known through the efforts of Mendocino National Forest and Bureau of Land Management archeologists involved in land inventories. By far the largest block, 260 resources, is the result of the 2002 City of Colusa Historic Resources Inventory. Most of the land in the county has not been examined for evidence of cultural resources and most historic period buildings have not been identified and documented. Many unique vestiges of the County's past wait to be discovered.

The 616 resource descriptions are listed in the records housed at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University as of August 6, 2009. The categories provide simple groupings of the resources based on shared characteristics. The 86 prehistoric period villages, for example, includes both permanent villages and more seasonally occupied camps, but all 86 areas showed evidence of repeated human occupation. The difference between the historic period building category and the historic period feature category is the fact that a building is still standing while a feature may be the remains of where a building once was, or other recognizable imprint such as a canal, railroad grade, or mine created during historic times.

The combined prehistoric and historic period resources are largely due to the simple fact that different peoples over time select the same choice spot for settlement and other activities. Some resources are special to the county such as the single historic ship, Colusa County's own Princeton Ferry (No. P-06-000560).

6.2 BIOLOGICAL AND NATURAL RESOURCES

The County's Planning Area contains a variety of biological communities and wildlife habitats that provide recreational opportunities and contribute to the overall functionality of valley and foothill ecosystems. This section describes biological resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect biological resources in the Planning Area.

METHODS

Biological resources within the Planning Area were identified through field reconnaissance, a review of pertinent literature, and database queries. The primary sources of data referenced for this section is derived from the following:

- California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (Skinner, Mark W. and Bruce M. Pavlik, Eds. 2001);
- A Manual of California Vegetation (Sawyer, John and Todd Keeler-Wolf 1995);
- Terrestrial vegetation of California (Barbour and Major 1988);
- Jepson Manual: Higher Plants of California (Hickman, James C. 1993);
- "Special Plants List." Natural Diversity Database. (California Dept. of Fish and Game);
- "Special Animals List." Natural Diversity Database. (California Dept. of Fish and Game);
- "Special Vascular Plants, Bryophytes, and Lichens List." Natural Diversity Database. (California Dept. of Fish and Game).
- Army Corps of Engineers Wetland Delineation Manual. (ACOE 1987)

KEY TERMS

The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

Hydric Soils. One of the three wetland identification parameters, according to the federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

Hydrophytic Vegetation. Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

Sensitive Natural Community. A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, are structurally complex, or are in other ways of special concern to local, state, or federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Game (CDFG) tracks sensitive natural communities in the California Natural Diversity Database (CNDDDB). Examples of sensitive natural communities in the Planning Area include northern hardpan vernal pools.

Special-Status Species. Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term "special status" includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the CDFG as a species of concern (USFWS), rare (CDFG), or of special concern (CDFG);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

Wetlands and Other Waters of the U.S. Wetlands are ecologically complex habitats that support a variety of both plant and animal life. In a jurisdictional sense, the federal government defines wetlands in Section 404 of the Clean Water Act as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b] and 40 CFR 230.3). Under normal circumstances, the federal definition of wetlands requires three wetland identification parameters be present: wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to other waters of the U.S (see definition below for "other waters of the U.S."). The U.S. Army Corps of Engineers (USACE) is the responsible agency for regulating wetlands under Section 404 of the Clean Water Act, while the Environmental Protection Agency (EPA) has overall responsibility for the Act.

The CDFG does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under Streambed Alteration Agreements or they support state-listed endangered species; however, CDFG is a trustee agency, meaning that they manage the wildlife and habitats of the state in trust pursuant to California law.

"Other waters of the U.S." refers to those hydric features that are regulated by the Clean Water Act but are not wetlands (33 CFR 328.4). To be considered jurisdictional, these features must exhibit a defined

bed and bank and an ordinary high-water mark. Examples of other waters of the U.S. include rivers, creeks, intermittent and ephemeral channels, ponds, and lakes.

REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the state and nation including the CDFG, USFWS, USACOE, and the National Marine Fisheries Service. These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. Federal and state agencies are increasingly involved with projects at the local level in Colusa County. The following is an overview of the federal, state and local regulations that are applicable to implementing the General Plan.

FEDERAL REGULATIONS

Federal Endangered Species Act

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a “take” unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

Migratory Bird Treaty Act

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Section 668) protect these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews federal agency actions that may affect these species.

Clean Water Act – Section 404

Section 404 of the CWA regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACOE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” [33 C.F.R. §328.3(e)].

The USACOE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a federal implementation policy, which is intended to result in no net loss of wetlands.

Clean Water Act – Section 401

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the state.

Department of Transportation Act - Section 4(f)

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the Federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

STATE REGULATIONS

Fish and Game Code §2050-2097 - California Endangered Species Act

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code §1900-1913 California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the state. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFG 10 days in advance of approving a building site.

Fish and Game Code §3503, 3503.5, 3800 - Predatory Birds

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, possess, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

Fish and Game Code §1601-1603 - Streambed Alteration

Under the California Fish and Game Code, CDFG has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a "Streambed Alteration Agreement" from CDFG prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFG may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFG warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

Public Resources Code § 21000 - California Environmental Quality Act

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the federal or state endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e. candidate, or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFG. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened,

or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

Public Resources Code § 21083.4 - Oak woodlands conservation

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a County to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a County determines that there may be a significant effect to oak woodlands, the County must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the County.

California Oak Woodland Conservation Act

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California's oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the state.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

LOCAL REGULATIONS

Colusa County General Plan (1989)

The 1989 Colusa County General Plan Conservation Element contains goals, policies and measures that address the preservation, management, and utilization of the County's natural resources. The

6. CONSERVATION AND NATURAL RESOURCES

Conservation Element contains provisions for the conservation and protection of forests, water, rivers, soils, minerals, and air, as well as the preservation of agricultural uses, wildlife and fisheries. The Conservation Element identifies the types of uses which are compatible with resource utilization, specifies measures necessary for the protection of human life and ecological values, and provides for recreational uses and the preservation of the County's scenery.

Colusa County Voluntary Oak Woodlands Management Plan

The purpose of plan is to provide a consistent policy for conservation and use of oak woodlands throughout Colusa County. The plan provides direction to landowners, the local government, and developers. Lastly, the plan provides landowners in Colusa County with an opportunity to obtain funding through the California Oak Woodlands Conservation Program.

The plan's goals are to encourage: landowner stewardship through education and incentives; sustainable ranching practices; planning that is consistent with oak woodlands conservation; and public education and outreach regarding oak woodlands.

Conservation Easements

A conservation easement is a legal agreement between a landowner and a non-profit organization or government agency that limits certain uses of the land covered by the easement in order to protect its conservation values. It allows the landowner to continue to own and use the land and to sell it or pass it on to heirs. Each easement is individually negotiated and only certain rights to the land are purchased or donated. For example, the landowner might give up the right to build additional structures, while retaining the right to ranch or grow crops. Future owners are also bound by the easement's terms. An easement may apply to just a portion of the property, and need not require public access. If an easement is donated and it benefits the public by permanently protecting important conservation resources it may qualify as a tax-deductible charitable donation. Conservation easements can be useful for passing land on to the next generation. By removing the land's development potential, the easement lowers its market value, which in turn lowers estate tax. The landowner continues to pay property taxes that are usually assessed at a similar rate to properties protected under the Williamson Act.

ENVIRONMENTAL SETTING

Colusa County encompasses approximately 1,156 square miles in north central California, of which 1,151 square miles is land and six square miles is water. . The eastern part of the county is located in the Sacramento Valley, the western portion is in the Klamath/North Coast Range. The climate varies by region, but generally the county has cool, wet winters and hot, dry summers. Precipitation is normally in the form of rain, with snow in the higher elevations, and ranges from approximately 13 to 55 inches per year. Figure 6.2-1 illustrates the precipitation zones across the county.

Geomorphic Provinces

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about earth's geologic processes and history. Colusa County is located in portions of the Coast Range, and Great Valley geomorphic provinces of California.

Great Valley. The Great Valley is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River and its southern part is the San Joaquin Valley drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic (about 160 million years ago). Great oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor.

Coast Range (North). The Coast Range is a northwest-trending mountain range (2,000 to 4,000, occasionally 6,000 feet elevation above sea level). The range trends northwest and subparallel to the San Andreas Fault. To the west is the Pacific Ocean and to the east is the Great Valley. The Coast Range is composed of thick Mesozoic and Cenozoic sedimentary strata that dips beneath alluvium of the Great Valley. The northern Coast Range is dominated by irregular, knobby, landslide-topography of the Franciscan Complex.

Bioregions

The county is defined by two different bioregions including the Sacramento Valley, and Klamath/North Coast. Figure 6.2-2 illustrates the boundaries of the bioregions within Colusa County. A brief description of each bioregion is presented below.

Sacramento Valley. The Sacramento Valley Bioregion is a watershed of the Sierra Nevada that encompasses the northern end of the great Central Valley, stretching from Redding to the southeast corner of Sacramento County. The bioregion is generally flat, and is rich in agriculture. The eastern portion of the County falls within this bioregion, which has a climate that is characterized by hot dry summers and cool wet winters. Oak woodlands, riparian forests, vernal pools, freshwater marshes, and grasslands provide the major natural vegetation of the bioregion. This bioregion is the most prominent wintering area for waterfowl, attracting significant numbers of ducks and geese to its seasonal marshes along the Pacific Flyway. Species include northern pintails, snow geese, tundra swans, sandhill cranes, mallards, grebes, peregrine falcons, heron, egrets, and hawks. Black-tailed deer, coyotes, river otters, muskrats, beavers, ospreys, bald eagles, salmon, steelhead, and swallowtail butterflies are some of the wildlife that are common in this bioregion.

Klamath/North Coast. The Klamath/North Coast Bioregion in California's northwestern corner extends roughly one-quarter of the way down the 1,100-mile coast and east across the Coastal Range and into the Cascades. Much of this bioregion is covered by forest and is the state's wettest climate, with rainfall distribution varying widely from an average annual 38 to 80 or more inches. The western portion of the County falls within this bioregion, which is considered "Inland" with a climate that is drier with low rainfall in winter and hot, dry summers. Vegetation includes mixed conifer habitat of white fir, Douglas fir, ponderosa pine, Sierra lodgepole pine, incense cedar, sugar pine, red fir, Jeffrey pine, mountain hemlock, knobcone pine, western red cedar, red alder, redwood, tanoak, Pacific madrone, and chaparral. Wildlife in the bioregion includes deer, fox, black bear, mountain lion, California clapper rail, Aleutian Canada geese, elk, osprey, fisher, bank swallow, salmon, Otis blue butterfly, bald eagle, Point Arena mountain beaver, Swainson's hawk, willow flycatcher, western sandpiper, and Oregon silverspot butterfly.

6. CONSERVATION AND NATURAL RESOURCES

Natural and Agricultural Communities

Natural and agricultural communities both provide a variety of habitat for the biological resources in Colusa County. Sensitive habitats include those that are of special concern to resource agencies or those that are protected under federal, state, or local regulations.

Colusa County is a biologically diverse part of the state. According to the California Wildlife Habitat Relationship System there are 24 cover types (wildlife habitat classifications) in Colusa County out of 59 found in the state. These include: Agricultural, Annual Grassland, Barren, Blue Oak Woodland, Blue Oak-Foothill Pine, Chamise-Redshank Chaparral, Closed-Cone Pine-Cypress, Douglas Fir, Fresh Emergent Wetland, Klamath Mixed Conifer, Mixed Chaparral, Montane Chaparral, Montane Hardwood, Montane Hardwood-Conifer, Montane Riparian, Ponderosa Pine, Red Fir, Riverine, Urban, Valley Foothill Riparian, Valley Oak Woodland, Water, Wet Meadow, and White Fir. Table 6.2-1 identifies the total area by acreage for each cover type (wildlife habitat classification) found in Colusa County. Figure 6.2-3 illustrates the location of each cover type (wildlife habitat classification) within the County. A brief description of each cover type follows.

TABLE 6.2-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM	
Cover Types	Acreage
Agriculture	339,955.0
Annual Grassland	110,055.0
Barren	723.0
Blue Oak Woodland	77,111.9
Blue Oak-Foothill Pine	10,429.3
Chamise-Redshank Chaparral	35,366.4
Closed-Cone Pine-Cypress	7,181.8
Douglas-Fir	7,734.3
Freshwater Emergent Wetland	18,922.7
Klamath Mixed Conifer	3,506.9
Mixed Chaparral	53,765.4
Montane Chaparral	7,275.5
Montane Hardwood	29,822.6
Montane Hardwood-Conifer	10,727.1
Montane Riparian	36.0
Ponderosa Pine	4,167.4
Red Fir	312.3
Riverine	177.7
Unknown Shrub Type	103.3
Urban	9,326.8
Valley Foothill Riparian	3,636.6
Valley Oak Woodland	1,222.6
Water	6,963.3
Wet Meadow	26.4
White Fir	831.1
Total	739,380.3

SOURCE: SOURCE: CASIL GIS DATA, 2009, CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM, 2009

Conifer Forest

Closed-cone pine-cypress habitats are typically found on sites that are more rocky and infertile than the surrounding soils. Many stands are found on serpentine soils. Although, typically found at low elevations, due to the coastal distribution of much of this habitat type, interior stands may be found at elevations up to 6550 ft. Landforms are gentle to steep slopes where stands occur in interior California and coastal terraces or bluffs where distributed along coastal California.

Douglas fir habitat is typically found in hot, dry summers and cool, mild, wet winters. Temperatures range from 57-72 F in the summer to 32-46 F in the winter. Annual precipitation varies from 24-27 in, generally less than 15 percent falling during summer. Precipitation increases inland and at higher elevations. Snowfall ranges from 2 to 31 inches and rarely persists later than June. Topography is characterized by rugged, deeply dissected terrain and steep slopes, especially toward the south. Major soil types are sedimentary granitic, and Ultramafic parent materials of gabbro, peridotite, and serpentine.

Klamath mixed conifer habitat occupies a complex of mountain ranges in northern California which are characterized by rugged, deeply dissected terrain with steep slopes due to extensive glaciation. This area has a considerable amount of ultramafic parent material and soils with scattered areas of serpentinitic soils; it also overlays a very old and complex geological structure. Average slopes are 60 percent or more and valleys are narrow. Climatic conditions include warm, wet winters and hot dry summers with precipitation varying from 69 inches on the western (maritime) side to 24 inches on the eastern (continental) side. Snowfall is moderate, ranging from 2 to 60 in, with large amounts of snowfall occurring at the middle and high elevations where this habitat occurs.

Montane hardwood-conifer habitat generally occurs on coarse, well drained mesic soils, in mountainous terrain with narrow valleys. Slopes average approximately 57 percent with all aspects encountered. Winters are cool and wet; summers are hot and dry. Northern California Montane Hardwood-Conifer sites have less rainfall and fog than Redwood or Mixed Conifer habitats. In southern California, this habitat is found at higher elevations, and in moist canyons. Average rainfall is 25 to 65 in, with some fog. The growing season is 7 to 11 months, with 200 to 300 frost-free days.

Ponderosa pine habitat is found on suitable mountain and foothill sites throughout California except in the immediate area of San Francisco Bay, in the north coast area, south of Kern County in the Sierra Nevada and east of the Sierra Nevada Crest. Ponderosa pine is found on all aspects, depending on soils and location within the local elevational range. Mean annual temperature is generally less than 55 F and precipitation is greater than 33 inches except in southern California. Less than one-third of the precipitation is snowfall.

Red fir habitats are found on frigid soils over a wide range of topography exclusive of very wet sites. Annual precipitation ranges from 40 to 50 inches per year, primarily as snow that forms packs up to 15 feet in winter. Summers are dry, limiting tree growth to seasonally available soil moisture.

White fir habitats are found on a variety of soils developed from different parent material, including volcanic and igneous rocks, granitics, various metamorphics, and sedimentary material. Soils are coarse textured, well-drained, have poorly developed profiles, are often rocky, and are cold, with mean annual temperatures from 32 -50 F. Cooler north- and east-facing slopes are the most common sites throughout the state. Precipitation is between 30-70 inches mostly in the form of snow. Almost all precipitation falls between October and May.

Hardwood Woodland

Blue oak-foothill pine habitat occurs in a typically Mediterranean climate with hot, dry summers and cool, wet winters. Most precipitation falls as rain from November through April, averaging 20 to 40 inches within the primary range of blue oak. The frost-free growing season ranges from 150 to 300 days, with winter temperatures averaging 30 F and summer temperatures averaging 90 F. Soils are from a variety of generally well-drained parent materials, ranging from gravelly loam through stony clay loam, with soils commonly rich in rock fragments.

Blue oak woodland habitat is usually associated with shallow, rocky, infertile, well-drained soils from a variety of parent materials. The climate is Mediterranean, with mild wet winters and hot dry summers. Average annual precipitation varies from 20 to 40 inches over most of the range, although extremes are noted from 10 to 60 inches. Mean temperatures range from 75-96 F in summer to 29-42 F in winter. The growing season ranges from 6 months in the north to the entire year in the south, with 175 to 365 frost-free days.

Valley oak woodland habitat occurs in a wide range of physiographic settings but is best developed on deep, well-drained alluvial soils, usually in valley bottoms. Most large, healthy valley oaks are probably rooted down to permanent water supplies. Stands of valley oaks are found in deep sills on broad ridgetops in the southern Coast Range. Where this type occurs near the coast, it is usually found away from the main fog zone. The climate is Mediterranean, with mild, wet winters and hot, dry summers.

Valley-foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers, mild and wet winters. Temperatures range from 75 to 102 F in the summer to 29 to 44 F in the winter. Average precipitation ranges from 6-30 inches, with little or no snow. The growing season is 7 to 11 months.

Hardwood Forest

Montane hardwood habitat is found on a wide range of slopes, especially those that are moderate to steep. Soils are for the most part rocky, alluvial, coarse textured, poorly developed, and well drained. Soil depth ranges from shallow to deep. Summer temperatures vary between 68 and 77 F and winter vary from 37 to 45 F. Frost-free days range from 160 to 230. Annual precipitation varies from 110 inches in the northern Coast Range to 36 inches in the mountains of southern California.

Montane Riparian areas are found associated with montane lakes, ponds, seeps, bogs and meadows as well as rivers, streams and springs. Water may be permanent or ephemeral. The growing season extends from spring until late fall, becoming shorter at higher elevations. Most tree species flower in early spring before leafing out.

Shrub

Chamise-Redshank Chaparral is found where soils are thin with little accumulation of organic. Chamise may be a dominant shrub on some serpentine sites and is most common on south and west facing slopes, while redshank is found on all aspects. Chamise-Redshank Chaparral is found in a Mediterranean climate; rainfall is 38 to 63 cm (15 to 25 in), less than 20 percent of total precipitation falls in summer, and winters are mild. The predominant land forms are steep slopes and ridges.

Mixed Chaparral occurs on all aspects, but at lower elevations, it generally is found on north-facing slopes. Generally, it occurs on steep slopes and ridges with relatively thin, well-drained soils. Soils can be rocky, sandy, gravelly or heavy. The Mediterranean climate is characterized by cool, wet winters and hot, dry summers. Total rainfall is 38 to 63 cm (15 to 25 in) with less than 20 percent falling during the summer.

Montane chaparral can be found on shallow to deep soils, on all exposures, and from gentle to relatively steep slopes. It may dominate on more xeric sites, but occurs locally throughout the coniferous forest zone. Generally, climate is like that associated with the coniferous forest zone, cold winter temperatures with substantial precipitation. Summers are typically hot and dry. In the northern portion of the state, montane chaparral is found between 914 to 2743 m (3000-9000 ft).

Herbaceous

Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost free season averages 250 to 300 days (18 to 21 fortnights). Annual precipitation is highest in northern California.

Wet meadows occur where water is at or near the surface most of the growing season, following spring runoff. Hydrologically, they occupy lotic, sunken concave, and hanging sites. Lotic sites are those with main input flow (other than precipitation) from upstream sources; at least early in the growing season, water flows across them at depths of 4-8 inches. Downstream runoff is the principal output flow. Lotic sites are topographic basins but have a slight slope, which permits drainage of surface water. Percolation is nil due to the saturated or slowly permeable nature of underlying materials. Sunken concave sites also receive water input from upstream sources, but evapotranspiration is the main output flow. Percolation is slowed by heavy-textured soils and/or shallow bedrock; however, in contrast to lotic and hanging sites, soil of sunken concave sites may dry to considerable depth by fall. Hanging sites are watered by hydrostatic flows as springs or seeps. They frequently occur on rather steep slopes, and downstream runoff is the main output flow. Surface flows, although constant, are usually no more than 0.4 inches deep.

Fresh emergent wetland habitats occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing.

Other

There are a variety of other habitat types documented with Colusa County. These include aquatic habitats such as lacustrine (water) and riverine (rivers/creeks), and agricultural habitats (deciduous orchard, dryland grain crops, irrigated grain crops, irrigated hayfields, irrigated row and field crops, and rice). Additionally, Colusa County contains areas that are barren and urban.

MANAGEMENT LANDSCAPE

Land management in Colusa County can be classified into four general categories: Agricultural (Active Farming), Agricultural (Rangeland/Forestland), Wildlife/Natural Lands Reserve, and Urban. Table 6.2-2 presents a breakdown of the acreage within each category. Figure 6.2-4 provides an illustration of each

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management classification. The following section provides an overview of the largest federal, state, and non-profit land management/conservation organizations and their lands in Colusa County.

TABLE 6.2-2: MANAGEMENT LANDSCAPE

Management Classification	Acreage
Agricultural (Active Farming)	247,059.0
Wildlife/Natural Lands Reserve	36,259.5
Urban	7,314.8
Agricultural (Rangeland/Forestland)	449,626.0
Total	740,259.3

SOURCE: CASIL GIS DATA, 2009

National Forest Lands

MENDOCINO NATIONAL FOREST. The Mendocino National Forest is 913,306 acres and lies in parts of six counties, including Colusa, Lake, Glenn, Mendocino, Tehama, and Trinity. Elevations in the Forest range from 750 feet to 8092 feet, with the average elevation about 4000 feet. An estimated 60,000 acres of old growth occur here, including forests of Douglas-fir, Ponderosa Pine, White Fir, Tanoak, and Pacific madrone. The Mendocino National Forest is the only one of California's 18 National Forests that are not crossed by a paved road or highway and it is attractive to people seeking outdoor recreation. The Forest provides resources through logging and grazing, in addition to its recreational activities.

National Wildlife Refuges

The Sacramento National Wildlife Refuge Complex consists of five national wildlife refuges (NWR) and three wildlife management areas (WMA) that comprise over 35,000 acres of wetlands and uplands in the Sacramento Valley, California. In addition, there are over 30,000 acres of conservation easements in the Complex. The Refuges and easements are part of the USFWS; they serve as resting and feeding areas for nearly half the migratory birds on the Pacific Flyway.

COLUSA NATIONAL WILDLIFE REFUGE. The Colusa National Wildlife Refuge is a 4,507-acre refuge primarily consisting of intensively managed wetland impoundments, with some grassland and riparian habitat. This Wildlife Refuge typically supports wintering populations of more than 200,000 ducks and 50,000 geese. Wetland impoundments are intensively managed to provide optimal habitat for the dense concentration of wintering waterfowl, as well as habitat for resident wildlife and spring/summer migrants.

The grassland habitat supports several populations of endangered and sensitive species of plants. The refuge is a stronghold for populations of the endangered palmate-bracted bird's-beak and the threatened giant garter snake. About 35,000 visitors come to the refuge each year for wildlife viewing and 4,000 come to hunt waterfowl and pheasant.

DELEVAN NATIONAL WILDLIFE REFUGE. The Delevan National Wildlife Refuge is a 5,797-acre refuge consisting of over 4,500 acres of intensively managed wetlands and 1,200 acres of uplands. More than 200,000 ducks and 100,000 geese come to the refuge each winter. The Wildlife Refuge supports several endangered plants and animals: giant garter snake, wintering peregrine falcon and bald eagle, breeding tricolored blackbird, and a large colony of the endangered palmate-bracted bird's beak. Resident wildlife include grebe, heron, blackbird, beaver, muskrat, black tailed deer and other species typical of upland

and wetland habitats. Approximately 7,000 people hunt on the refuge each year and an estimated 1,000 visitors observe wildlife from a primitive roadside overlook along the Maxwell-Colusa Highway.

SACRAMENTO NATIONAL WILDLIFE REFUGE. The Sacramento National Wildlife Refuge is a 10,783-acre refuge consisting of about 7,600 acres of intensively managed wetlands, uplands, riparian habitat, and vernal pools. It typically supports wintering populations of more than 600,000 ducks and 200,000 geese. The refuge supports several endangered plants and animals, including transplanted colonies of palmate-bracted birds-beak, several species of fairy shrimp, vernal pool tadpole shrimp, giant garter snake, wintering peregrine falcon, bald eagle, and breeding tricolored blackbird. Resident wildlife includes grebe, heron, blackbird, golden eagle, beaver, muskrat, black-tailed deer, and other species typical of upland and wetland habitats. Approximately 9,000 people hunt on the refuge each year, and 73,000 people use the visitor center, auto tour route, and walking trail.

WILLOW CREEK-LURLINE WILDLIFE MANAGEMENT AREA. The Willow Creek-Lurline Wildlife Management Area is an approximately 20,000 acre area that has been approved for acquisition of conservation easements on privately owned wetlands to protect fall/winter habitat for waterfowl. Approximately 12,000 acres of the Wildlife Management Area are privately owned for the purpose of waterfowl hunting. Conservation easements have been acquired on approximately 6,000 acres, requiring landowners to maintain land in wetlands. The area is surrounded by intensive agriculture (rice and other grains). These privately-owned lands are closed to public access.

NORTH CENTRAL VALLEY WILDLIFE MANAGEMENT AREA. The North Central Valley Wildlife Management Area was established primarily to protect wintering habitat for waterfowl. Under the North Central Valley WMA the USFWS has the authority to purchase conservation easements on up to 48,750 acres of private lands located within an 11 county area of the Sacramento Valley. Within this management area, the Service has purchased conservation easements on 11,811 acres from willing landowners to protect wildlife habitat. In exchange for payment, the landowners agree to maintain wetlands and other habitats on their property in perpetuity. These Wildlife Management lands are privately owned and not open for public access.

State Recreational Areas

Colusa-Sacramento River State Recreation Area. The Colusa-Sacramento River State Recreation Area has 67 acres along the Sacramento River. Wildlife in the area includes deer, raccoons, opossums, foxes, skunks and muskrats, which are sheltered by riverbank cottonwood and willow trees. Wild grape and fig are among many other shrubs, trees and plants along the river. Common bird species include ring-necked pheasants, California quail, mallard ducks, Canada geese, western meadowlarks, northern flickers and ospreys. This facility provides 14 campsites, picnic sites, and a launch ramp for small boats, and is also within walking distance of the City of Colusa's downtown.

State Wildlife Areas

COLUSA BYPASS WILDLIFE AREA. This 1,248 acre wildlife area is mostly grasslands with several rows of willows and cottonwood trees that line the eastern edge of the property. Excess water is diverted into the area from the Sacramento River during high flows in the winter. The area provides a significant amount of cover for mammals and both resident and migratory birds. Hunting is allowed and opportunities are mostly for upland game, including deer, pheasant, snipe, and dove. Bird watching and wildlife viewing are also common.

SACRAMENTO RIVER WILDLIFE AREA. This 4,014 acres of wildlife area is located in 14 separate units along the west and east side of the Sacramento River in Butte, Glenn, and Colusa Counties. The wildlife area is a riparian forest dominated by cottonwood, willow, ash, sycamore, and box elder trees with a dense understory of wild grape, pipevine, poison oak and grasslands, oxbow lakes, and gravel bars. Common wildlife along the river includes otters, beavers, gray fox, bobcat, western pond turtles, ash-throated flycatchers, great blue herons, egrets, and a variety of birds of prey. Hunting is allowed and opportunities are mostly for deer, quail, turnkey, and dove. Fishing, trapping, and bird watching are also common.

U.S. Reclamation Projects

EAST PARK RESERVOIR. East Park Reservoir was authorized in 1907 by the federal government as a storage facility to provide irrigation waters, under the Orland Project. East Park Reservoir is in the northwestern part of Colusa County few miles southeast of Stonyford and northwest of Lodoga. The total land area around the reservoir is 2,468 acres and the total water surface is 1,820 acres. Common mammals are wild pigs, coyotes, blacktail deer, tule elk, ground squirrels and black-tailed jackrabbits. Canada geese, bald eagles, a wide variety of ducks and bird species, and the special status tri-colored blackbird can be seen around the reservoir. East Park Reservoir provides opportunities for camping, boating, picnicking and fishing.

TEHAMA-COLUSA CANAL. The Tehama-Colusa Canal is a canal that carries diverted water from the Red Bluff Diversion Dam along a 110-mile canal. The canal initially carries 2,530 cubic feet per second, and at its terminus 1,700 cubic feet per second. The canal was built from 1965 to 1980. An 80-foot dam called Funks Dam controls water flow along the Tehama-Colusa Canal. Funk Reservoir backs up behind the dam Five pump plants take water from the canal and feed it into the Colusa County water distribution grid.

American Land Conservancy

BEAR VALLEY RANCH. A conservation easement over the 16,513-acre Bear Valley Ranch was acquired by the American Land Conservancy in 2001. The conservation easement permanently precludes development on the property, while permitting traditional cattle ranching. The ranch is known as having one of the state's most spectacular wildflower displays. This conservation easement was funded by the California Wildlife Conservation Board and the David and Lucile Packard Foundation. The easement is monitored by California Rangeland Trust.

SULPHUR CREEK. The American Land Conservancy acquired 1,531 acres in the Sulphur Creek valley in 1999. The Sulphur Creek valley is part of a 6,500-acre watershed located in the coastal range. From 2002 to 2005, the American Land Conservancy oversaw a three-year restoration effort on the property that was funded by the California Wildlife Conservation Board. The area was once heavily mined for gold, but is now known for the natural hot springs that are part of the historic Wilbur Hot Springs resort. The American Land Conservancy sold the resort to subject to a conservation easement that precludes development of the land and protects the oak woodlands, grasslands and riparian habitat.

PAYNE RANCH. A conservation easement over the 3,140-acre Payne Ranch was acquired by the American Land Conservancy in 2006. Payne Ranch is a private working cattle ranch in Colusa County. The southern border of the Payne Ranch is contiguous to 27,245 acres specially-designated as the Cache Creek Wilderness Area, home to one of the largest free roaming Tule Elk populations in California, the second largest wintering bald eagle population in the state, as well as numerous rare and endangered plant and animal communities. The conservation easement conserves the agricultural, ecological, and

scenic resources of the property while contributing to the environmental health of the surrounding 70,000-acre Cache Creek Natural Area. The Payne Ranch connects to two other American Land Conservancy projects in the region – Bear Valley Ranch and Sulphur Creek, which together conserve nearly 20,000 acres that contribute to the region’s rich biodiversity. The conservation easement was funded by the California Wildlife Conservation Board.

REGIONALLY IMPORTANT HABITAT AND WILDLIFE

Oak Woodlands

Oak woodlands are rich in wildlife and are a favored place for people to recreate, build their homes, and pursue their livelihoods. Unfortunately, oak woodlands are disappearing throughout the state. They are being lost to intensive agriculture, woodcutting, housing and other urban development, and where they remain they have had regenerative problems.

Colusa County contains approximately 133,000 acres of oak woodlands and ten different oak species including: interior live oak (*Quercus wislizeni*), canyon live oak (*Q. chrysolepis*), black oak (*Q. kelloggii*), scrub oak (*Q. berberidifolia*), valley oak (*Q. lobata*), Oregon white oak (*Q. garryana*), blue oak (*Q. douglasii*), leather oak (*Q. durata*), Huckleberry oak (*Q. vaccinifolia*), and Palmer’s oak (*Q. Palmeri*). These oak woodlands are classified into the following six communities: blue oak woodland, blue oak / foothill pine woodland, montane hardwood, montane hardwood-conifer, valley oak woodland, and valley foothill riparian. Table 6.2-3 provides a breakdown of the acreage associated with each oak woodland community. Figure 6.2-5 provides an illustration showing the distribution of oak woodlands within Colusa County.

Community	Acreage
Blue Oak Woodland	77,111.9
Blue Oak-Foothill Pine	10,429.3
Montane Hardwood	29,822.6
Montane Hardwood-Conifer	10,727.1
Valley Foothill Riparian	3,636.6
Valley Oak Woodland	1,222.6
Total	132,950.0

SOURCE: CASIL GIS DATA, 2009

Large private ranches make up the bulk of the oak woodlands in the foothills located on the west side of Colusa County. Within these oak-covered landscapes, cattle production has become the primary economic activity. The county’s cattle industry is the fifth largest contributor to its economy, behind rice, almonds, tomatoes and walnuts. In addition, productive ranches provide many benefits to all county residents including; wildlife habitat, open-space, recreation lands, honey bee forage, fire control, weed management, and remote watersheds that produce abundant clean water.

Oak woodlands harbor a rich diversity of native plant and wildlife species. The combination of the county’s mild Mediterranean climate and the abundant food provided by acorns allow many animal species to remain here year-round. Oak woodlands also provide critical wintertime habitat to migratory species that spend their summers at higher elevations. Because of these qualities, oak woodlands are thought to have the richest wildlife species abundance of any habitat in California with estimates of 331

species according to the CDFG. Oak woodlands provide habitat for a number of threatened and endangered species. Additionally, many of the state's species of special concern are found within oak woodlands. Because oak woodlands are widely distributed, they often create a mosaic of plant communities in which other less common habitats occur such as vernal pools, wetlands, grasslands, and riparian.

As the county's population grows, there will be continuing pressure to convert oak woodlands to more intensive uses such as housing and ranchettes. The problems associated with development in oak woodlands often creates infrastructure problems and decreases wildlife habitat values. Fire safety needs increase because a greater population is at risk and because there are more opportunities for wildfire ignition by human activities.

Tule Elk Population

Tule elk are endemic to California and the most specialized elk in North America. It is the smallest subspecies of all American elks, with the average weight of adult males only 450 - 550 pounds and adult females only at 375 - 425 pounds. In its historic range, the tule elk once occupied much of California's Central Valley. Their range spanned east of the foothills of the Sierra Nevada west to the coast line and north from the headwaters of the Sacramento River south to the Tehachapi Mountains.

Accounts in journals and diaries of early explorers indicate that approximately 500,000 tule elk inhabited the State. Between 1800 and 1840 hide and tallow hunters took large numbers of elk. In 1873 a law was passed to fully protect tule elk, although at that time it was unclear if any even remained. By the turn of the century, the population of elk had expanded and was causing extensive damage to fences, crops, and irrigated pasture. At this time, the California Academy of Science took over a tule elk relocation effort whereby they relocated 235 tule elk to 22 different locations, including Cache Creek. Tule elk at Cache Creek were allowed to expand their range and, until the summer of 1986, did not cause significant damage to private property. Currently there are 21 herds of tule elk throughout California with numbers estimated at about 3,800.

Competition with domestic stock has been shown to be a minor threat to tule elk. However, overgrazing or high intensity grazing can leave large areas with no food value for the elk for extended periods of time. Conflicts between ranchers and elk have historically posed a problem. Elk are an increasingly popular game animal, and management efforts in the last few decades have caused the population to grow. As the numbers increase so does the incidence and intensity of damage to agriculture.

Continued human development and encroachment is a threat to tule elk. A large portion of their range is on private property with no permanent protection. There is a constant threat of development or subdividing the properties into small ranches. One of the other major threats is habitat degradation and invasive noxious weeds. Exotic weed species (star thistle) is a large problem for the Cache Creek herd, as it has taken over many acres of otherwise suitable habitat.

Deer Population

Columbian black-tailed deer (*Odocoileus hemionus columbianus*) are not recognized as a special-status species; however, preserving deer habitat and migration corridors is of concern to the CDFG in many foothill and mountainous regions of California. The CDFG has divided the State into 11 Deer Assessment Units (DAUs). Colusa County's is located within Unit 5 (Central Sierra) and Unit 8 (Central Coast-North). The deer herds of Unit 5 are largely migratory deer located within the west slope of the Sierra Nevada Mountain range, with smaller resident populations along the Sacramento Valley floor including Colusa

County. The deer herds of Unit 8 largely resident animals that exhibit some upslope/downslope movement with seasonal changes in weather and forage conditions.

Deer within Colusa County are common within the forest communities where common habitat includes several oak species, western mountain mahogany, chamise, riparian-wetland areas, willow/birch, ceanothus, and manzanita. Deer are also common in the foothill communities where common habitat includes oak-woodland, oak-annual grass savanna, and chaparral shrub stands. Deer are less common, but can be found in the valley floor in agricultural fields, pastures, and riparian areas.

Salmon and Steelhead Trout Fisheries

Salmon and steelhead trout are anadromous fish species that are present in the Sacramento River Basin. Anadromous fish are born in freshwater rivers and streams, and then migrate to the Pacific Ocean to grow and mature before returning to their place of origin to spawn. The Sacramento River system produces most of the Chinook salmon (*Oncorhynchus tshawytscha*) and a large percentage of the steelhead trout (*Oncorhynchus mykiss*) in California.

Anadromous fish resources once flourished naturally in the Sacramento River system, but as a result of habitat destruction from water storage/diversion projects, mining, sedimentation, and bank degradation, they are protected species under the Endangered Species Act. The Sacramento River system has historically supported steelhead trout and four distinct spawning runs of Chinook salmon: fall, late fall, winter, and spring. The salmon runs have declined since the late 1800s and are now characterized as episodic. The Central Valley steelhead was federally listed as threatened in 2003. The fall/late fall-run salmon is a federal and state species of concern, and a candidate species for federal listing. The spring-run Chinook salmon population is listed as threatened by both federal and state agencies. Winter-run Chinook salmon population is listed as a federally and state endangered species. Populations of Central Valley Steelhead and Chinook salmon are supported by hatcheries within the Sacramento River Basin.

Water remaining behind the dams by the start of the spawning run in October is often warmed by summer heat. Warm water and low water elevation are harmful to most coldwater anadromous fish species. Riparian vegetation is critical for the maintenance of high quality fish habitat. It provides cover, controls temperature, stabilizes stream banks, provides food, and buffers streams from erosion and impacts of adjacent land uses. Riparian vegetation also affects stream depth, current velocity, and substrate composition. The decline of riparian communities in California is a factor contributing to the loss of high quality fish habitat.

WATERSHEDS

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 6.2-4 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

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TABLE 6.2-4: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION

Watershed Level	Approximate Square Miles (Acres)	Description
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES, 2009

Hydrologic Regions/Units in Colusa County

The majority of Colusa County is considered part of the Sacramento River Hydrologic Region. However, a small, north-western corner of the County contributes its drainage to the Pacific through the North Coast Hydrologic Region.

SACRAMENTO RIVER HYDROLOGIC REGION. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties, and small areas of Alpine and Amador counties. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains.

NORTH COAST HYDROLOGIC REGION. The North Coast hydrologic region covers approximately 12.46 million acres (19,470 square miles) and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties, and small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties. Extending from the Oregon border south to Tomales Bay, the region includes portions of four geomorphic provinces.

HYDROLOGIC UNITS. Within Colusa County there are five hydrologic units. These include the Cache Creek, Cortina, Colusa Basin, Stony Creek, and Upper Elmira.

Hydrologic Areas

For purposes of planning on a County-wide basis, hydrologic areas are generally considered to be the appropriate watershed planning level. As specific projects within the County are developed the hydrologic area level may be too large in terms of scale, and a hydrologic subarea may be considered more appropriate. The remainder of this section is based on the hydrologic area level for watershed planning purposes.

Colusa County is located within 12 hydrologic areas. These include: Bear Creek, Butte Basin, Cortina Creek, East Blue Ridge, Fouts Springs, Glenn Colusa, Logan Creek, Lower Cache Creek, Middle Cache

Creek, Stone Corral, Sycamore Sutter, and Whiskey Creek. Table 6.2-5 provides a breakdown of the acreages of each watershed within Colusa County. Figure 6.2-6 provides an illustration of each watershed.

TABLE 6.2-5: WATERSHEDS (HYDROLOGIC AREAS)

Community	Acreage
Bear Creek	65,746.00
Butte Basin	43,200.20
Cortina Creek	11,327.50
East Blue Ridge	33.72
Fouts Springs	110,769.00
Glenn Colusa	288,804.00
Logan Creek	2,916.90
Lower Cache Creek	48.65
Middle Cache Creek	570.15
Stone Corral Creek	94,779.10
Sycamore-Sutter	103,713.00
Whiskey Hill	18,348.90
Total	740,257.12

SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES, 2009

Impaired Water Bodies

Section 303(d) of the federal Clean Water Act requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish Water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

Five watersheds within Colusa County have Section 303(d) listed impaired water bodies. The impaired water bodies are located within the Butte Basin, Glenn Colusa, Sycamore-Sutter, East Blue Ridge, and Bear Creek hydrologic areas. These hydrologic areas extend beyond the county boundary so not all impaired water body segments are located within Colusa County. The pollution source is predominantly agricultural and crop related, although mercury, and resource extraction is also a pollution source. There are a few pollution sources that are not currently known.

SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the CNDDb, the CNPS Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within the region.

Special Status Plants

The search revealed documented occurrences of the 43 special status plant species within Colusa County. Table 6.2-6 provides a list of special-status plant species that are documented in the region,

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their habitat, and current protective status. Figure 6.2-7 illustrates the location of each documented occurrence.

TABLE 6.2-6: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
Plants		
<i>Amsinckia lunaris</i> bent-flowered fiddleneck	--;--;1B	Cismontane woodland, valley and foothill grassland. 50-500M.
<i>Anisocarpus scabridus</i> scabrid alpine tarplant	--;--;1B	Upper montane coniferous forest. Open stony ridges, metamorphic slopes of mountain peaks, and cliffs in or near red fir forest. 1650-2300M.
<i>Antirrhinum subcordatum</i> dimorphic snapdragon	--;--;4	Chaparral, lower montane coniferous forest. Generally on serpentine or shale in foothill woodland or chaparral on S. and W. facing slopes. 185-800M.
<i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i> Sonoma canescent manzanita	--;--;1B	Chaparral, lower montane coniferous forest. Sometimes found on serpentine. 180-1700M.
<i>Arctostaphylos manzanita</i> ssp. <i>elegans</i> Konocti manzanita	--;--;1B	Chaparral, cismontane, lower montane coniferous forest. Volcanic soils. 395-1400M.
<i>Astragalus rattanii</i> var. <i>jepsonianus</i> Jepson's milk-vetch	--;--;1B	Cismontane woodland, valley and foothill grassland, chaparral. Commonly on serpentine in grassland or openings in chaparral 320-700M.
<i>Astragalus tener</i> var. <i>ferrisiae</i> Ferris' milk-vetch	--;--;1B	Meadows, valley and foothill grassland. Subalkaline flats on overflow land in the Central Valley; usually seen in dry adobe soil. 5-75M.
<i>Atriplex cordulata</i> Heartscale	--;--;1B	Chenopod scrub, meadows, seeps, Sandy soils in the valley and foothill grasslands (Dry alkaline flats)
<i>Atriplex depressa</i> Brittlescale	--;--;1B	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools (Alkaline flats and clay soils)
<i>Atriplex joaquinian</i> San Joaquin spearscale	--;--;1B	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub 1-250M.
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> Big-scale balsamroot	--; --;1B	Chaparral, cismontane woodland, and valley and foothill grassland (Open, grassy slopes, and valleys, sometimes on serpentine soils)
<i>Botrychium crenulatum</i> scalloped moonwort	--;--;2	Bogs and fens, meadows, lower montane coniferous forest, freshwater marsh, moist meadows, near creeks. 1500-2670M.
<i>Brodiaea coronaria</i> ssp. <i>rosea</i> Indian Valley brodiaea	--;CE;1B	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland, meadows. Serpentine gravelly creek bottoms, and in meadows and swales. 335-1450M.
<i>California macrophylla</i> round-leaved filaree	--;--;1B	Cismontane woodland, valley and foothill grassland. Clay soils. 15-1200M.
<i>Calycadenia micrantha</i> small-flowered calycadenia	--;--;1B	Chaparral, valley and foothill grassland, meadows and seeps, lower montane coniferous forest. Rocky talus, sparsely vegetated areas. Occasionally on roadsides, sometimes on serpentine. 5-

TABLE 6.2-6: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
		1500M.
<i>Carex klamathensis</i> Klamath sedge	--;--;1B	Meadows and seeps, chaparral, cismontane woodland. Serpentine. 1000-1140M.
<i>Castilleja rubicundula</i> ssp. <i>rubicundula</i> pink creamsacs	--;--;1B	Chaparral, meadows, and seeps, valley and foothill grassland. Openings in chaparral or grasslands. Serpentine. 20-900M.
<i>Chlorogalum pomeridianum</i> var. <i>minus</i> dwarf soaproot	--;--;1B	Chaparral, valley and foothill grassland. Serpentine. 240-970M.
<i>Cordylanthus palmatus</i> palmate-bracted bird's-beak	FE;CE;1B	Chenopod scrub, valley and foothill grassland. Usually on Pescadero silty clay which is alkaline, with <i>Distichilis</i> , <i>Frankenia</i> , etc. ETC. 5-155M.
<i>Cryptantha excavat</i> deep-scarred cryptantha	--;--;1B	Cismontane woodland. Sandy, gravelly, dry stream banks. 100-500M.
<i>Delphinium recurvatum</i> Recurved larkspur	--; --;1B	Cismontane woodland and valley and foothill grasslands (Alkaline soils)
<i>Didymodon norrisii</i> Norris' beard moss	--;--;2	Cismontane woodland, lower montane coniferous forest. Moss from intermittently mesic sites. On rocks. 600-1700M.
<i>Epilobium nivium</i> Snow Mountain willowherb	--;--;1B	Upper montane coniferous forest, chaparral. In crevices of rocky outcrops, and dry talus and shale slopes. 785-2500M.
<i>Eriastrum brandegeae</i> Brandegee's eriastrum	--;--;1B	Chaparral, cismontane woodland on barren volcanic soils; often in open areas. 345-1000M.
<i>Eriastrum tracyi</i> Tracy's eriastrum	--;CR;1B	Chaparral, cismontane woodland. Gravelly shale or clay; often in open areas. 315-760M.
<i>Eriogonum nervulosum</i> Snow Mountain buckwheat	--;--;1B	Chaparral. Dry serpentine outcrops, balds, and barrens. 300-2100M.
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy	--;--;1B	Valley and foothill grassland. Alkaline, clay slopes and flats. 0-975M.
<i>Fritillaria pluriflora</i> adobe-lily	--;--;1B	Chaparral, cismontane woodland, foothill grassland. Usually on clay soils; sometimes serpentine. 55-820M.
<i>Harmonia hallii</i> Hall's harmonia	--;--;1B	Chaparral. Serpentine hills and ridges. Open, rocky areas within chaparral. 500-900M.
<i>Hesperolinon drymarioides</i> drymaria-like western flax	--;--;1B	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Serpentine soils, mostly within chaparral. 390-1000M.
<i>Hibiscus lasiocarpus</i> woolly rose-mallow	--;--;2	Marshes and swamps (freshwater). Moist, freshwater soaked river banks and low peat islands in sloughs; in California, known from the Delta Watershed. 0-150M.
<i>Horkelia bolanderi</i> Bolander's horkelia	--;--;1B	Lower montane coniferous forest, chaparral, meadows, valley and foothill grassland. Grassy margins of vernal pools and meadows. 450-850M.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	--;--;1B	Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and

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TABLE 6.2-6: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
Coulter's goldfields		grasslands. 1-1400M.
<i>Layia septentrionalis</i> Colusa layia	--;--;1B	Chaparral, cismontane woodland, valley and foothill grassland, scattered colonies in fields and grassy slopes in sandy or serpentine soil. 145-1095M.
<i>Lotus rubriflorus</i> red-flowered bird's-foot-trefoil	--;--;1B	Valley and foothill grassland, cismontane woodland. Most recent sightings' from sterile, red soils-volcanic mudflow deposits. 200-425M.
<i>Lupinus milo-bakeri</i> Milo Baker's lupine	--;CT;1B	Cismontane woodland, valley and foothill grassland in roadside ditches, dry gravelly areas along roads, and along small streams. 360-440M.
<i>Lupinus sericatus</i> Cobb Mountain lupine	--;--;1B	Chaparral, cismontane woodland, lower montane coniferous forest. In stands of knobcone pine-oak woodland, on open wooded slopes in gravelly soils; sometimes on serpentine. 180-1500M.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	--;--;1B	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales, adobe or alkaline soils. 5-950M.
<i>Neostapfia colusana</i> Colusa grass	FT;CE;1B	Vernal pools. Usually in large, or deep vernal pool bottoms; adobe soils. 5-110M.
<i>Sidalcea keckii</i> Keck's checkerbloom	FE;--;1B	Cismontane woodland, valley and foothill grassland. Grassy slopes in blue oak woodland. 180-425M.
<i>Silene campanulata</i> ssp. <i>campanulata</i> Red Mountain catchfly	--;CE;4	Lower montane coniferous forest, chaparral. State listed endangered, but CNPS list 4; Rocky dry shallow serpentine soil. 420-1200M.
<i>Streptanthus morrisonii</i> Morrison's jewel-flower	--;--;1B	Chaparral, cismontane woodland, closed-cone coniferous forest. Serpentine. The complex has been mapped as the species, though at least 4 ssp. have been recognized. 210-910M.
<i>Trichocoronis wrightii</i> var. <i>wrightii</i> Wright's trichocoronis	--;--;2	Marshes and swamps, riparian forest, meadows and seeps, vernal pools. Mud flats of vernal lakes, drying river beds, alkali meadows. 5-435M.

SOURCE: DFG CNDDDB 2009

ABBREVIATIONS:

FE	FEDERAL ENDANGERED
FT	FEDERAL THREATENED
CE	CALIFORNIA ENDANGERED SPECIES
CT	CALIFORNIA THREATENED
CR	CALIFORNIA RARE (PROTECTED BY NATIVE PLANT PROTECTION ACT)
1B	CNPS - RARE, THREATENED, OR ENDANGERED
2	CNPS - RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE
4	CNPS - PLANTS OF LIMITED DISTRIBUTION - A WATCH LIST

Special Status Animals

The search revealed documented occurrences of the 38 special status animal species within Colusa County including: eight invertebrates, four amphibians/reptiles, 16 birds, and 10 mammals. Table 6.2-7 provides a list of the special-status animal species that are documented in Colusa County, their habitat, and current protective status. Figure 6.2-8 illustrates the location of each documented occurrence.

TABLE 6.2-7: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
Invertebrates		
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	FT;--	Endemic to grasslands of the central valley, central coast mtns., and south coast mtns., in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.
<i>Cicindela hirticollis abrupta</i> Sacramento Valley tiger beetle	FSC;--	Sandy areas, dry paths or fields.
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	FT;--	Occurs only in the central valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.
<i>Lepidurus packardii</i> vernal pool tadpole shrimp	FE;--	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed & highly turbid.
<i>Ochthebius relictus</i> Wilbur Springs minute moss beetle	--;--	Aquatic; known only from Wilbur Hot Springs Area, Colusa County; 1250 ft elevation. Inhabits the shoreline of the creek at Wilbur Hot Springs.
<i>Paracoenia calida</i> Wilbur Springs shore fly	--;--	Endemic to Wilbur Hot Springs, Colusa County. Inhabits all but the hottest portion of the hot springs effluent; water temp 20-40 degrees Celsius.
<i>Saldula usingeri</i> Wilbur Springs shorebug	--;--	Requires springs/creeks with high concentration of NA, CL, & LI. Found only on wet substrate of spring outflows.
<i>Trachykele hartman</i> serpentine cypress wood-boring beetle	--;--	Larvae develop in argent cypress. Restricted to Napa, Colusa, and Lake Counties.
Amphibians/Reptiles		
<i>Actinemys marmorata</i> western pond turtle	--;CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.
<i>Rana boylei</i> foothill yellow-legged frog	FSC;CSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.
<i>Spea hammondi</i> western spadefoot toad	FSC;CSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.
<i>Thamnophis gigas</i> Giant garter snake	FT;CT	Freshwater marshes, sloughs, ponds, small lakes or low gradient streams with adjacent upland areas. Also has adapted to drainage canals, irrigation ditches, and agricultural wetlands especially flooded rice fields.
Birds		
<i>Accipiter cooperii</i> Cooper's hawk	MBTA; Raptor	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, and in canyon bottoms on riper flood-plains; also in live oaks.
<i>Agelaius tricolor</i> tricolored blackbird	FSC;CSC	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey

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TABLE 6.2-7: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
		within a few km of the colony.
<i>Aquila chrysaetos</i> golden eagle	MBTA; CP	Rolling foothills, mountain areas, sage juniper flats, and desert. Cliff walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.
<i>Athene cuniculari</i> Burrowing owl	FSC; CSC/ Raptor	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
<i>Branta hutchinsii leucopareia</i> cackling (=Aleutian Canada) goose	FD;--	Winter resident of agricultural lands.
<i>Buteo swainsoni</i> Swainson's hawk	FSC; CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranches. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.
<i>Charadrius montanus</i> mountain plover	FSC/ MBTA	Short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms. Short vegetation, bare ground & flat topography. Prefers grazed areas and areas with burrowing rodents.
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	FSC/FC; CE	Nesting restricted to river bottoms and other mesic habitats where humidity is high.
<i>Egretta thula</i> snowy egret	FSC/ MBTA	Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas; marshes, tidal flats, streams, wet meadows, and borders of lakes.
<i>Elanus leucurus</i> white-tailed kite	MBTA; CP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated dense-topped trees for nesting and perching.
<i>Falco mexicanus</i> prairie falcon	FSC/ MBTA; Raptor	Inhabits dry, open terrain, either level or hilly breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.
<i>Haliaeetus leucocephalus</i> bald eagle	FSC/FD; CE/CP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within one mile of water. Nests in large, old-growth, or dominant live three w/open branches especially ponderosa pine. Roosts communally in winter.
<i>Nycticorax nycticorax</i> black-crowned night heron	MBTA;--	Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.
<i>Pandion haliaetus</i> osprey	MBTA; Raptor	Ocean shore, bays, fresh water lakes, and larger streams. Large nests built in tree tops within 15 miles of a good fish producing body of water.
<i>Plegadis chihi</i> White-faced Ibis	--; CSC	Nests in dense, fresh emergent wetlands.
<i>Riparia riparia</i> bank swallow	--;CT;--	Restricted to riparian areas with vertical cliffs and banks with fine-textured or sandy soils while breeding.

TABLE 6.2-7: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COLUSA COUNTY

Species	Status	Habitat
Mammals		
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	--;CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open hangings from walls and ceilings. Roosting sites limited. Extremely sensitive to human disturbance.
<i>Lasionycteris noctivagans</i> silver-haired bat	--;--	Primarily a coastal & montane forest dweller feeding over streams, ponds & open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes & rarely under rocks. Needs drinking water.
<i>Lasiurus blossevillei</i> western red bat	FSC;CSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat at edges & mosaics with trees that are protected from above & open below with open areas for foraging.
<i>Lasiurus cinereus</i> hoary bat	--;--	Prefers open habitat or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. requires water.
<i>Martes americana humboldtensis</i> Humboldt marten	--;CSC	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County. Associated with late succession coniferous forests, prefer forests with low, overhead cover.
<i>Martes pennanti pacifica</i> Pacific fisher	FC;CSC	Occurs in intermediate to large-tree stages of coniferous forests and deciduous-riparian habitats with a high percentage of canopy closure.
<i>Myotis ciliolabrum</i> western small-footed myotis	FSC;--	Wide range of habitats mostly arid wooded & brushy uplands near water. Seeks cover in caves, buildings, mines & crevices. Prefers open stands in forests and woodlands. Requires drinking water. Feeds on a wide variety of small flying insects.
<i>Myotis yumanensis</i> Yuma myotis	FSC;--	Reside in open forests and woodland habitats with sources of water over which to feed. Roost in buildings, mines, caves, and crevices.
<i>Perognathus inornatus</i> San Joaquin Pocket Mouse	FSC;--	Annual grassland and scrub habitats with fine-textured soil conditions.
<i>Taxidea taxus</i> American badger	--;CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils and open, uncultivated ground. Prey on burrowing rodents. Dig burrows.

SOURCE: DFG CNDDDB 2009

ABBREVIATIONS:

- FE FEDERAL ENDANGERED
- FT FEDERAL THREATENED
- FC FEDERAL CANDIDATE
- FSC FEDERAL SPECIES OF CONCERN
- FD FEDERAL DELISTED
- MBTA PROTECTED BY MIGRATORY BIRD TREATY ACT
- CE CALIFORNIA ENDANGERED SPECIES
- CT CALIFORNIA THREATENED
- CP CALIFORNIA FULLY PROTECTED UNDER §3511, 4700, 5050 AND 5515 FG CODE
- CSC CDFG SPECIES OF SPECIAL CONCERN

Special Status Communities

The search revealed documented occurrences of the eight sensitive natural communities within Colusa County and a brief description follows. Figure 6.2-9 illustrates the location of each natural community.

COASTAL AND VALLEY FRESHWATER MARSH. Coastal and Valley Freshwater Marsh is found along the coast and in coastal valleys near river mouths and around the margins of lakes and springs, and they are the most extensive in the upper portion of the Sacramento-San Joaquin River Delta. This natural community is common in the river oxbows and other areas of a flood plain. This natural community is found in areas that lack significant stream/river current and are permanently flooded by fresh water (rather than brackish, alkaline, or variable). Prolonged saturation permits accumulation of deep, peaty soils. Perennial, emergent monocots up to 4-5m tall dominate this habitat. They often form completely closed canopies.

GREAT VALLEY COTTONWOOD RIPARIAN FOREST. Great Valley Cottonwood Riparian Forest is found in fine-grained alluvial soils near perennial or nearly-perennial streams that provide subsurface irrigation even when the channel is dry. These sites are inundated yearly during spring, resulting in annual input of nutrients, soil, and new germination sites. This natural community is a dense, broadleaved, winter-deciduous riparian forest dominated by Fremont's cottonwood (*Populus fremontii*) and San Joaquin willow (*Salix goodingii*). Understories are dense, with abundant vegetative reproduction of canopy dominants. California wild grape (*Vitis californica*) is the most conspicuous vine species. Scattered seedlings and saplings of shade-tolerant species such as Box elder (*Acer negundo*) or Oregon ash (*Fraxinus latifolia*) may be found, but frequent flooding prevents their reaching into the canopy.

GREAT VALLEY MIXED RIPARIAN FOREST. Great Valley Mixed Riparian Forest is found on relatively fine-textured alluvium somewhat back from active river channels. These sites experience overbank flooding (with abundant alluvial deposition and groundwater recharge) but not too severe physical battering or erosion. This natural community is a tall, dense, winter-deciduous, broadleaved riparian forest with a tree canopy that is fairly well closed and moderately to densely stocked with several species including Box elder (*Acer negundo*), California black walnut (*Juglans hindsii*), California sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*) and San Joaquin willow (*Salix goodingii*), red willow (*Salix laevigata*), and shining willow (*Salix lucida*). Understories consist of these taxa plus shade-tolerant shrubs like buttonbush (*Cephalanthus occidentalis*) and Oregon ash (*Fraxinus latifolia*). Several vine species are conspicuous in both tree and shrub canopies.

GREAT VALLEY WILLOW SCRUB. The Great Valley Willow Scrub are found along all of the major rivers and most of the smaller streams throughout the Great Valley watershed. This natural community is an open to dense, broadleaved, winter-deciduous shrubby streamside thicket dominated by any of several willow species (*Salix* spp.). Dense stands usually have little understory or herbaceous component, while more open stands have grassy understories, usually dominated by introduced species.

NORTHERN CLAYPAN VERNAL POOL. Northern Claypan Vernal Pool is found on lower terraces and basin rims, toward the valley trough in the Central San Joaquin Valley north to Glenn and Colusa counties. The sites are considered fairly old, circum-neutral to alkaline, Si-cemented hardpan soils. They are often more or less saline. Pools may be small (a few square meters) or quite large (covering several ha) and they generally have lower overall plant coverage compared to other vernal pool communities.

SERPENTINE BUNCHGRASS. Serpentine Bunchgrass grassland occurs on chemically unique serpentine soils, and is primarily composed of purple needlegrass (*Nassella pulchra*) and a variety of native and introduced annual plants.

VALLEY NEEDLEGRASS GRASSLAND. Valley Needlegrass Grassland is a mid-height (to 2 feet) grassland dominated by perennial, tussock-forming purple needlegrass (*Nassella pulchra*). Native and introduced annuals occur between the perennials, often exceeding the bunchgrasses in cover. They are usually found on fine-textured (often clay) soils, moist or even waterlogged during the winter, but very dry in the summer. Often associated with Oak Woodlands on moister, better drained sites.

WILDFLOWER FIELD. Wildflower Fields are a mix of herb-dominated types noted for conspicuous annual wildflower displays. Dominance varies from site to site and from year to year at a particular site. They are usually found on fairly poor sites (droughty, low in nutrients), associated with Grasslands or Oak Woodlands on surrounding, more productive sites.

6.3 HYDROLOGY AND WATER QUALITY

Colusa County contains both surface and ground water resources. Water used for urban and community land uses comes almost exclusively from groundwater sources. Therefore, the discussion of groundwater resources and groundwater quality in Colusa County is included in Section 3.1- Community Services and Facilities. The analysis in this section focuses on surface water resources within Colusa County. The information in this section was derived primarily from the 2008 Colusa County Groundwater Management Plan (GMP), the Northern California Water Association, and the U.S. Bureau of Reclamation.

REGULATORY SETTING

FEDERAL REGULATIONS

Clean Water Act (CWA)

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for small Municipal Separate Storm Sewer Systems (MS4s) covered under the CWA to efficiently regulate numerous storm water discharges under a single permit. Permittees must meet the requirements in Provision D of the General Permit, which require the development and implementation of a Storm Water Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. The SWMP must include the following six minimum control measures:

- 1) Public Education and Outreach on Storm Water Impacts
- 2) Public Involvement/Participation

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- 3) Illicit Discharge Detection and Elimination
- 4) Construction Site Storm Water Runoff Control
- 5) Post-Construction Storm Water Management in New Development
- 6) Redevelopment and Pollution Prevention/Good Housekeeping for Municipal Operations

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the Federal Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWC.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the RWQCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from construction sites statewide. Stormwater discharges from industrial and construction activities in the Central Valley Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

STATE REGULATIONS

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the

SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Water Quality Control Plan for the Central Valley Region

The Water Quality Control Plan for the Central Valley Region (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term “water quality standards,” as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region’s ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act.

LOCAL REGULATIONS

1989 Colusa County General Plan

The existing (1989) Colusa County General Plan contains multiple policies that seek to protect water quality and hydrologic resources. These policies include requirements to control and treat surface water runoff prior to discharge into surface water bodies, the conservation of water resources, and coordination with state and federal water regulators to monitor water quality.

Colusa County Resource Conservation District (CCRCD) Long Range Plan

The CCRCD Long Range Plan (2008-2013) provides a foundation whereby resource concerns within Colusa County may be identified, studied, and addressed. The Long Range Plan will be reviewed annually and remain effective for a period of five years. The CCRCD anticipates that water quality and quantity will remain a priority resource concern well into the timeframe of the Long Range Plan. The CCRCD will engage in the following activities to address this vital natural resource:

- Provide technical support and educational outreach to promote practices that limit sediment, nutrient, and pesticide discharges
- Support programs that decrease or remove illegal waste dumped in waterways and eradicate and manage invasive species
- Seek grant funding to assist landowners implement conservation practices that address water quality issues
- Promote irrigation practices that reduce irrigation runoff and increase water use efficiency
- Promote conservation practices that address water use efficiency in urban areas

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- Survey riparian habitat and plan restoration needs with interested landowners
- Work with all agencies of authority to reduce and control flooding
- Integrate the Colusa County Groundwater Management Plan
- Strengthen partnerships with local irrigation districts, reclamation districts, and other stakeholders in addressing water quality and conservation to insure a reliable supply for all beneficial purposes

Sacramento Valley Integrated Regional Water Management Plan

Northern California water suppliers in partnership with local governments, environmental representatives and state and federal agencies continue to refine an "Integrated Regional Water Management Plan for the Sacramento Valley" (Regional Plan). The Regional Plan is designed to protect Northern California water rights and supplies and it will serve as a roadmap for present and future generations to provide water for farms, cities, birds, fish and recreation.

SURFACE WATER BODIES

The Sacramento River is the only major naturally occurring water body in Colusa County. The four major man-made water bodies in the County are the Colusa Basin Drainage Canal, the Tehama Colusa Canal, the Glenn Colusa Canal, and the East Park Reservoir. The following discussion provides information on the location, ownership, infrastructure, and an overview of the operational practices of the major water bodies that relate to or are within Colusa County.

Sacramento River

The Sacramento River is the only major naturally occurring water body in Colusa County. It runs north-south through the eastern part of the County and passes through on its way to the Delta and San Francisco Bay. Many tributary streams flow from the mountains on both sides of the valley into the Sacramento River. According to a 2005 report by the Glenn County Department of Agriculture, flows in the Sacramento River near Grimes in Southern Colusa County range from 6,500 cubic feet per second (cfs) to 16,900 cfs for the period of record of 1946-2003 (GMP, 2008).

According to the GMP, data is not currently available to characterize the stream/aquifer interaction along the Sacramento River through Colusa County. To properly determine groundwater–surface water interaction, it is necessary to have nested monitoring wells located in close proximity to a stream gage. The nested monitoring wells must be completed in the very shallow groundwater zone that is directly connected to a surface water system, and in the deeper zones as well. The existing well locations are not suitable for characterizing the stream/aquifer interaction. The Department of Water Resources (DWR) Northern District has stated that existing data is inadequate to characterize the system (GMP, 2008).

Colusa Basin

The Colusa Basin is a flat, lowland on the Sacramento Valley floor and extends from the City of Orland south to Knights Landing, and the Sacramento River and the Coastal Range foothills form its eastern and western boundaries, respectively. The Colusa Basin watershed is approximately 1,620 square miles (over one million acres) and lies within Glenn, Colusa, and northern Yolo Counties.

Most of the land in the Basin is used primarily for agricultural production and also contains three national wildlife refuges: Sacramento, Delevan, and Colusa. Reclamation District No. 2047 (RD 2047) was formed in 1919, prompted by the inadequacy of the existing drainage facilities with the Colusa Basin

(GMP, 2008). Increased development of the Colusa Basin caused return flows from irrigation to create flooding problems downstream of the irrigated areas (GMP, 2008). RD 2047 developed a plan to construct physical works to handle the irrigation return flow. The principle feature of the RD 2047 plan was the Colusa Basin Drainage Canal.

Colusa Basin Drainage Canal

The manmade Colusa Basin Drainage Canal conveys stormwater runoff and agricultural return flows from the Colusa Basin watershed and discharges to the Sacramento River at Knights Landing. The canal begins at the junction with Willow Creek and flows southerly to its terminus at the Knights Landing Ridge Outfall Gates. The Colusa Basin Drainage Canal is designed to convey irrigation drainage flows to the Knights Landing Outfall Gates for discharge into the Sacramento River. During high flows, the Knights Landing Outfall Gates are closed and water in the Colusa Basin Drain is often diverted through the Knights Landing Ridge Cut to the Yolo Bypass. The Colusa Basin Drain is the single largest source of agricultural return flows to the Sacramento River (GMP, 2008).

The Colusa Basin Drainage Canal has thirty-two naturally occurring ephemeral creeks, fourteen of which are in Colusa County, that drain flows from the foothill area (USBR, 2000). Those in Colusa County include:

- Cortina Creek
- Freshwater Creek
- Glenn Valley Slough
- Manor Slough
- Salt Creek
- Spring Creek
- Sycamore Slough
- Elk Creek
- Funks Creek
- Lurline Creek
- Petroleum Creek
- Sand Creek
- Stone Corral Creek
- Walters Creek

Runoff in these creeks typically begins in late fall, peaking in mid-winter, and decline to no flow in late spring (GMP, 2008). This runoff generally passes through the Colusa Basin with little impairment for consumptive use and continues to the Sacramento River or Yolo Bypass through the Colusa Basin Drain. There is little to no naturally occurring water supplies in the Colusa Basin in the summer other than groundwater (GMP, 2008). Water from the Sacramento River was initially diverted and used for irrigation use; however, after the construction of the Colusa Basin Drain, irrigators started reusing the irrigation return flows.

Tehama Colusa Canal

The Tehama Colusa Canal receives water from the settling basin at Red Bluff Diversion Dam. Groundbreaking ceremonies for the canal took place July 31, 1965. The canal is 110.9 miles long. It travels south from Red Bluff Diversion Dam through Tehama, Glenn, Colusa Counties, and into Yolo County, and terminates about two miles south of Dunnigan, California. The initial capacity of the canal is 2,530 cubic feet per second, diminishing to 1,700 cubic feet per second at the terminus.

The Tehama Colusa Canal System diverts water from the Sacramento River for use by various water districts across the region. The canal system is owned by the U.S. Bureau of Reclamation (USBR) and operated by the Tehama Colusa Canal Authority (TCCA). The dam at Red Bluff is owned and operated by

the USBR. Within this arrangement exists a network of release structures and pumps that frequently result in complex flow conditions in the canals and pipes that deliver water to the districts. The TCCA's mission statement is: *"... to secure, protect, and develop dependable and affordable sources of water and to operate, maintain, and improve the works essential to deliver such water."* Operating two canal systems for the USBR (the Tehama Colusa Canal, 110 miles long and the Corning Canal, 15 miles long), the combined system serves 17 water districts.

Glenn Colusa Canal

The Glenn Colusa Canal is operated by the Glenn Colusa Irrigation District (GCID). GCID is the largest water district in the Sacramento Valley. Located approximately eighty miles north of Sacramento, California, the district boundaries cover approximately 175,000 acres; of which 153,000 acres are deeded property and 138,800 are irrigable. There are 1,076 landowners in the District and an additional 300 tenant water users. There are an additional 5,000 acres of private habitat land, and winter water supplied by GCID to thousands of acres of rice land provides valuable habitat for migrating waterfowl during the winter months.

GCID's main pump station, its only diversion from the Sacramento River, is located near Hamilton City. The District's 65-mile long Main Canal conveys water into a complex system of nearly 1,000 miles of canals, laterals and drains, much of it constructed in the early 1900s.

From its first diversions until 1964, GCID relied upon its historic water rights and adequate water supply from the Sacramento River hydrologic system which receives rainfall and snowmelt from a 27,246 square mile watershed with average runoff of 22,389,000 acre-feet, providing nearly one-third of the state's total natural runoff. In 1964, after nearly two decades of negotiations with the United States, GCID along with other Sacramento River water rights diverters entered into "Settlement Water Contracts" with the USBR. These Settlement Contracts were necessary at that time to allow the USBR to construct, operate, and divert water for the newly constructed Central Valley Project. The contract provided GCID with water supply for the months of April through October for 720,000 acre-feet of base supply, and 105,000 acre-feet of Central Valley Project water that is purchased during the months of July and August. During a designated critical year when natural inflow to Shasta Reservoir is less than 3.2 million acre-feet, GCID's total supply is reduced by 25 percent, to a total of 618,000 acre-feet.

Additionally, the District has rights under a (SWRCB permit to "winter water" from November 1 through March 31 at a 1,200 cfs diversion rate. This water supply is used for rice straw decomposition and waterfowl habitat. The permit provides 150,000 acre-feet for rice straw decomposition and 32,900 acre-feet for crop consumption.

Groundwater can be used to supplement GCID's supplies, with 5,000 acre-feet available from District wells, and approximately 45,000 acre-feet from privately owned landowner wells.

East Park Reservoir

East Park Dam, which forms East Park Reservoir, is part of the Orland Project. Completed in 1910, the dam was authorized under the Reclamation Act of June 17, 1902 and stores irrigation waters diverted and impounded from Stony Creek, Little Stony Creek, Squaw Creek, and Little Indian Creek. East Park Reservoir measures 2.7 miles in length and encompasses an area of 1,820 acres. The reservoir has a total capacity of 52,000 acre-feet. There are 25 miles of shoreline, ten miles of which are available for recreation. East Park Reservoir is located approximately 20 miles west of the town of Maxwell. The small

town of Stonyford lies a few miles northwest of the reservoir, and the smaller community of Lodoga is near the southeastern corner.

Total land area around the reservoir is 2,468 acres. Approximately 1,630 acres at the reservoir is used by the public for recreation, including boating, fishing, and bird watching. There are approximately 200 acres of wetlands and 1,200 acres of upland wildlife areas. Cattle graze on approximately 1,900 acres during the off-season. Currently, the reservoir is open to the public approximately April through the end of September.

Proposed Sites Reservoir

The proposed Sites reservoir has been identified by the DWR and the CALFED Bay-Delta Program (CALFED) as one of the most cost-effective and environmentally beneficial new facilities under consideration in California (Northern California Water Association {NCWA}, 2010). The California legislature first recognized the potential for a project at Sites in 1993 (AB 2315, Chapter 415, Statutes of 1993). The CALFED Record of Decision (ROD) provides that "CALFED will join local partners in Stage 1 (seven years) to evaluate" Sites reservoir. A joint planning Memorandum of Understanding for the reservoir between federal and state agencies and local interests in the Sacramento Valley was signed in November 2000.

The CALFED ROD also states that the project, if ultimately constructed, could enhance water supply reliability for environmental, urban and agricultural uses throughout the state. Sites would provide water supplies in average and dry years for urban, agricultural and environmental purposes, increase Delta outflows during critical times, improve flood control, enhance groundwater recharge, contribute to the Environmental Water Account (EWA), and improve flexibility for existing projects, such as Shasta Reservoir (NCWA, 2010).

The proposed location of the Sites off-stream storage project is approximately 10 miles west of Maxwell in Antelope Valley. The reservoir would have a storage capacity of 1.9 million acre-feet (possibly larger) and would enhance water management flexibility throughout the state. Sites reservoir can greatly increase reliability of water supplies in the Sacramento Valley and other areas of the state by reducing water diversions on the Sacramento River during critical fish migration periods. In addition, by providing additional storage and operational benefits, Sites reservoir would be a critical component of an integrated water management and water development program for the Sacramento Valley.

Sites reservoir, as an off-stream project, would be filled primarily by pumped diversions from the Sacramento River. Water would be diverted into the reservoir during peak flow periods in winter months (for example, during flood years like 1997 and 1998). To minimize potential impacts of existing diversions on Sacramento River fisheries, Sites would release water back into valley conveyance systems (such as the Glenn Colusa Irrigation District Canal and Tehama Colusa Canal) in exchange for water that would otherwise have been diverted from the Sacramento River. This undiverted summer water could become available for other downstream uses in the Bay-Delta.

SEASONAL AND LONG TERM WATER QUALITY

Under the USGS National Water Quality Assessment Program, the USGS conducted an intensive study of the Sacramento River Basin and collected data between 1995 and 1998. Through the sampling process, indicator streams were determined based upon the characterization that they drain small to intermediate sized watersheds with relatively homogeneous land use and geology. The Colusa Basin Drain basin is located entirely in the Sacramento Valley and was chosen as an indicator stream to

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determine the impacts of agriculture on stream-water quality (GMP, 2008). At the indicator water quality station, Colusa Basin Drain at Road 99E near Knights Landing, it was determined that pH levels were generally on the higher end, with declining suspended sediment concentrations over the two-year sampling period. The higher concentrations of mercury correlate with suspended sediment because much of the load of total mercury is transported with the suspended material.

The findings of the USGS study also indicated that the water of the Sacramento River and its major tributaries is generally of good quality; the amount of dissolved solids in the Sacramento River and its major tributaries (Yuba, Feather, and American rivers) was low at all of the sampled locations. Higher median concentrations of dissolved solids occurred at agricultural sites such as the Sacramento Slough and Colusa Basin Drain, but those are diluted upon mixing with Sacramento River water (GMP, 2008). Nutrient concentrations such as nitrate also were low throughout the Sacramento River Basin (GMP, 2008), and drinking-water standards for nitrate were not exceeded during the course of this study. The concentrations of molinate and other pesticides (used in rice farming) measured during this study in the Colusa Basin Drain or in the Sacramento River, represent a significant improvement over concentrations measured in previous years (GMP, 2008).

SEASONAL AND LONG TERM HYDROLOGY

Climate has a direct impact upon the availability of water in Colusa County. According to the data collected by the Western Regional Climate Center, the average annual precipitation is 15.64 inches per year and average snowfall is 0.5 inches per year (GMP, 2008). The annual average temperature is approximately 61°F, with an average high of 96.6°F in July and 36.1°F in January.

Rainfall in the Sierra Nevada, Coast Range, and Cascade Mountains contribute to surface water flow and groundwater recharge in the Sacramento River Basin. The general direction of surface water flow is toward the center of the valley, flowing south. Water diversions, evaporation, and groundwater recharge reduce flows as the Sacramento River approaches the Delta. Peak flow typically occurs in the months January through March and minimum flows typically occur September through November (GMP, 2008).

SURFACE WATER SUPPLY CONTRACTS

Settlement Contracts

USBR currently contracts with approximately 145 water districts, water purveyors, or private users for water rights to the Sacramento River. The total amount of water under the settlement contracts is approximately 2.2 million acre-feet and cover a total of almost 440,000 acres of land bordering the Sacramento River and its tributaries between Redding and Sacramento. The Settlement Contracts were originally executed in 1964 with a term not to exceed 40 years. New contracts have been executed with approximately 145 existing Sacramento River Settlement Contracts.

The Settlement Contracts include a Base Supply and Project Water. The Base Supply is the amount that reflects the agreed-upon water right of the respective entity. This is generally regarded as pre-1914 water rights and reflects water that would be available to the respective entities under “natural” conditions.

Project Water represents the amount of water the USBR agrees to provide from its Central Valley Project yield. Altogether, there are 42 contractors in Colusa County, representing an estimated total contract amount of 763,000 acre-feet, with approximately 84 percent Base Supply and 16 percent

Project Supply. Approximately eight percent or 60,000 acre-feet is within contracts with entities within the non-organized areas. The balance, or 92 percent of the contract amount, is managed by water purveyors, some of which serve land in both Colusa County and Glenn or Yolo Counties (GMP, 2008). Under the provisions of the Settlement Contracts both the Base Supply and Project Supply could be reduced by 25 percent of the total contract amount.

Long Term Renewal Contracts

In accordance with the Central Valley Project Improvement Act (CVPIA), the USBR negotiated long-term water service contracts in 2007. According to Section 3404c of the CVPIA, Renewal of Existing Long-Term Contracts requires the USBR to renew any existing long-term repayment or water service contract for the delivery of water from the Central Valley Project for a period of 25 years and may renew such contracts for successive periods of up to 25 years each. It is anticipated that as many as 113 CVP (Central Valley Project) water service contracts, located within the Central Valley of California, may be renewed during this negotiation process (GMP, 2008). There are seven water service contracts within the County, including with Colusa County. The total contract amount is 224,586 acre-feet, of which 20,000 acre-feet is with Colusa County. Colusa County has subcontracted the 20,000 acre-feet to seven water purveyors.

The long-term renewal contracts, unlike the Settlement Contracts, have no specified reduction in delivery; during critically dry or water-short years, the water supply available from the Project will be allocated among the contractors. There is no minimum allocation, thus it is conceivable that no water would be delivered.

Also, the long-term renewal contracts contain a tiered pricing provision. The Base Supply is 80 percent of the total contract amount, and Tier 1 and Tier 2 supplies represent 10 percent each of the remaining contract amount. Each tier has an incrementally higher water cost. The Tier 1 and Tier 2 water, which is available in most years, is not used due to the incremental higher cost of water. To illustrate the use of contract water in relation to the contract amount, in 2003, 137,302 acre-feet was delivered by the USBR, representing 76 percent of the total 179,668 acre-feet of Base Supply (GMP, 2008).

6.4 SCENIC RESOURCES

Colusa County possesses numerous scenic resources, many of which are found in the natural areas within the unincorporated county. These resources not only enhance the quality of life for Colusa County residents, but are a significant attraction that brings tourists to the region. Landscapes can be defined as a combination of four visual elements: landforms, water, vegetation, and man-made structures. Scenic resource quality is an assessment of the uniqueness or desirability of a visual element. This section reviews and summarizes Colusa County's key scenic resources.

METHODOLOGY

This section was prepared based on existing reports and literature for the Colusa County. Additional sources of information included the California Department of Transportation's (Caltrans) Designated Scenic Route map for Colusa County. A reconnaissance-level visual resource survey of the County was conducted in the fall of 2009.

KEY TERMS

Scenic Highway Corridor. The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

Scenic Highway/Scenic Route. A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, General Plans in California were required to include a Scenic Highways Element.

View Corridor. A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a City or county.

REGULATORY SETTING

STATE

California Department of Transportation – California Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from the Caltrans Scenic Highway Coordinators.

If a route is not included on a list of highways eligible for scenic highway designation in the Streets and Highways Code Section 263 et seq., it must be added before it can be considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

When a local jurisdiction nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic highway designation protects the scenic values of an area. Jurisdictional boundaries of the nominating agency are also considered, and the agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

To receive official designation, the local jurisdiction must follow the same process required for official designation of State Scenic Highways. The minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

ENVIRONMENTAL SETTING

Colusa County is largely defined by its rural agricultural setting. Much of the County is in active agricultural production, consisting of numerous farming operations, some of which cover thousands of contiguous acres of land. The County is also home to three National Wildlife Refuges, two National Wildlife Management Areas, one State Recreation Area, two State Wildlife Areas, three Land Conservancy Areas, and a wide variety of habitat types and surface water resources that contribute to the scenic beauty and quality of life in Colusa County. These visual and scenic resources are described in greater detail below.

Scenic Highways and Corridors

According to the California Scenic Highway Mapping System, administered by Caltrans, there are no officially designated scenic highways or scenic corridors in Colusa County. However, there are two Eligible State Scenic Highway Corridors in Colusa County that have not yet been officially designated.

1. In southwestern Colusa County the segment of SR 20 between the County line and the junction of SR 20 and SR 16 is eligible for designation as a State Scenic Highway.
2. In southwestern Colusa County the segment of SR 16 between the County line and the junction of SR 20 and SR 16 is eligible for designation as a State Scenic Highway.

Natural Scenic Resources

Colusa County encompasses an outstanding variety of natural vistas and landscapes. The following section describes the significant scenic resources found in the county.

Agricultural Lands. As described throughout the Background Report, much of the land Colusa County is currently in active agricultural production. While not a natural condition of the land, agricultural lands are perceived by many viewers as having a relatively high level of scenic value. Agricultural lands in Colusa County consist of orchards, row crops, and rice fields. Agricultural lands provide scenic viewsheds largely void of man-made structures. Many viewers perceive large swaths of land neatly covered in various types of crops as having a very high scenic value.

The eastern half of the County is dominated by a “checkerboard” of large acreage farms, with land ownership and road alignments generally following square mile section lines. Views of agricultural lands in the eastern portion of the County are expansive, and framed primarily by the rolling foothills of the Coast Range to the west and the jagged peaks of the Sutter Buttes to the east.

In the western portions of the County, large farms give way to much larger cattle and sheep ranches, cultivated fields give way to arid rangeland, and the flat terrain found throughout the eastern portions of the County transitions into rolling hills and spectacular upland valleys. Further west, the land becomes even more rugged and wild as elevations increase up to 7,000 feet in the Mendocino National Forest and the wilderness areas surrounding Snow Mountain.

Sutter Buttes. The Sutter Buttes are a small circular complex of eroded volcanic lava domes which rise above the flat plains of the Central Valley of California. The highest peak, South Butte, reaches about 2,130 feet (650 m) above sea level. The Buttes are located just outside of Yuba City, California in the Sacramento Valley, the northern part of the Central Valley. They are named for John Sutter, who received a large land grant from the Mexican government. The Sutter Buttes also hold the title of being

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the world's smallest mountain range. While not located within Colusa County, the Sutter Buttes provide a distinct visual backdrop to the eastern portion of Colusa County.

The indigenous Maidu referred to the Sutter Buttes as *Esto Yamani* and the native Patwin called them *Onolai*, both names roughly translate to mean The Middle Mountains. They were regarded as a spiritual place for renewal and sustenance rather than a place to live or build villages. A tour of the Sutter Buttes can yield historical markers, rock walls, the remains of old stone corrals, building foundations, historic homes and even a circular stone-lined well right beside the road. Several cemeteries are scattered around the Buttes.

Snow Mountain. Snow Mountain is a mountain with two 7,000+ summits named Snow Mountain East and Snow Mountain West, located on the border of Colusa County and Lake County in the northwestern portion of Colusa County. The East peak is the highest point of both counties. The mountain is part of the Pacific Coast Ranges mountain system and it is the first tall peak in the California Coast Ranges north of San Francisco. On clear days, the peak can be seen from Mount Diablo, and from several peaks in the Mayacamas Mountains, such as Mount Saint Helena, and Mount Konocti. Usually, the peaks are quite prominent from the California Central Valley, moreover the Sacramento Valley, such as from Interstate 5. On clear days the peaks can be seen from most vantage points in Colusa County. Like its name states, the summits and nearby high mountains get snowfall in winter, and the snowpack can last until June. The mountain gives its name to the 37,700-acre Mountain Wilderness in the Mendocino National Forest.

National Wildlife Refuges and Wildlife Management Areas

The Sacramento National Wildlife Refuge Complex consists of five national wildlife refuges (NWR) and three wildlife management areas (WMA) that comprise over 35,000 acres of wetlands and uplands in the Sacramento Valley, California. In addition, there are over 30,000 acres of conservation easements in the Complex. The Refuges and easements are part of the USFWS; they serve as resting and feeding areas for nearly half the migratory birds on the Pacific Flyway.

Colusa National Wildlife Refuge. The Colusa National Wildlife Refuge is a 4,507-acre refuge primarily consisting of intensively managed wetland impoundments, with some grassland and riparian habitat. This Wildlife Refuge typically supports wintering populations of more than 200,000 ducks and 50,000 geese. Wetland impoundments are intensively managed to provide optimal habitat for the dense concentration of wintering waterfowl, as well as habitat for resident wildlife and spring/summer migrants.

The grassland habitat supports several populations of endangered and sensitive species of plants. The refuge is a stronghold for populations of the endangered palmate-bracted bird's-beak and the threatened giant garter snake. About 35,000 visitors come to the refuge each year for wildlife viewing and 4,000 come to hunt waterfowl and pheasant.

Delevan National Wildlife Refuge. The Delevan National Wildlife Refuge is a 5,797-acre refuge consisting of over 4,500 acres of intensively managed wetlands and 1,200 acres of uplands. More than 200,000 ducks and 100,000 geese come to the refuge each winter. The Wildlife Refuge supports several endangered plants and animals: giant garter snake, wintering peregrine falcon and bald eagle, breeding tricolored blackbird, and a large colony of the endangered palmate-bracted bird's beak. Resident wildlife include grebe, heron, blackbird, beaver, muskrat, black tailed deer and other species typical of upland and wetland habitats. Approximately 7,000 people hunt on the refuge each year and an estimated 1,000 visitors observe wildlife from a primitive roadside overlook along the Maxwell-Colusa Highway.

Sacramento National Wildlife Refuge. The Sacramento National Wildlife Refuge is a 10,783-acre refuge consisting of about 7,600 acres of intensively managed wetlands, uplands, riparian habitat, and vernal pools. It typically supports wintering populations of more than 600,000 ducks and 200,000 geese. The refuge supports several endangered plants and animals, including transplanted colonies of palmate-bracted birds-beak, several species of fairy shrimp, vernal pool tadpole shrimp, giant garter snake, wintering peregrine falcon, bald eagle, and breeding tricolored blackbird. Resident wildlife includes grebe, heron, blackbird, golden eagle, beaver, muskrat, black-tailed deer, and other species typical of upland and wetland habitats. Approximately 9,000 people hunt on the refuge each year, and 73,000 people use the visitor center, auto tour route, and walking trail.

Willow Creek-Lurline Wildlife Management Area. The Willow Creek-Lurline Wildlife Management Area is an approximately 20,000 acre area that has been approved for acquisition of conservation easements on privately owned wetlands to protect fall/winter habitat for waterfowl. Approximately 12,000 acres of the Wildlife Management Area are privately owned for the purpose of waterfowl hunting. Conservation easements have been acquired on approximately 6,000 acres, requiring landowners to maintain land in wetlands. The area is surrounded by intensive agriculture (rice and other grains). These privately-owned lands are closed to public access.

North Central Valley Wildlife Management Area. The North Central Valley Wildlife Management Area was established primarily to protect wintering habitat for waterfowl. Under the North Central Valley WMA the USFWS has the authority to purchase conservation easements on up to 48,750 acres of private lands located within an 11 county area of the Sacramento Valley. Within this management area, the Service has purchased conservation easements on 11,811 acres from willing landowners to protect wildlife habitat. In exchange for payment, the landowners agree to maintain wetlands and other habitats on their property in perpetuity. These Wildlife Management lands are privately owned and not open for public access.

State Recreational Areas

Colusa-Sacramento River State Recreation Area. The Colusa-Sacramento River State Recreation Area has 67 acres along the Sacramento River. Wildlife in the area includes deer, raccoons, opossums, foxes, skunks and muskrats, which are sheltered by riverbank cottonwood and willow trees. Wild grape and fig are among many other shrubs, trees and plants along the river. Common bird species include ring-necked pheasants, California quail, mallard ducks, Canada geese, western meadowlarks, northern flickers and ospreys. This facility provides 14 campsites, picnic sites, and a launch ramp for small boats, and is also within walking distance of the City of Colusa's downtown.

State Wildlife Areas

COLUSA BYPASS WILDLIFE AREA. This 1,248 acre wildlife area is mostly grasslands with several rows of willows and cottonwood trees that line the eastern edge of the property. Excess water is diverted into the area from the Sacramento River during high flows in the winter. The area provides a significant amount of cover for mammals and both resident and migratory birds. Hunting is allowed and opportunities are mostly for upland game, including deer, pheasant, snipe, and dove. Bird watching and wildlife viewing are also common.

SACRAMENTO RIVER WILDLIFE AREA. This 4,014 acres of wildlife area is located in 14 separate units along the west and east side of the Sacramento River in Butte, Glenn, and Colusa Counties. The wildlife area is a riparian forest dominated by cottonwood, willow, ash, sycamore, and box elder trees with a dense understory of wild grape, pipevine, poison oak and grasslands, oxbow lakes, and gravel bars. Common

wildlife along the river includes otters, beavers, gray fox, bobcat, western pond turtles, ash-throated flycatchers, great blue herons, egrets, and a variety of birds of prey. Hunting is allowed and opportunities are mostly for deer, quail, turnkey, and dove. Fishing, trapping, and bird watching are also common.

US Reclamation Projects

EAST PARK RESERVOIR. East Park Reservoir was authorized in 1907 by the federal government as a storage facility to provide irrigation waters, under the Orland Project. East Park Reservoir is in the northwestern part of Colusa County few miles southeast of Stonyford and northwest of Lodoga. The total land area around the reservoir is 2,468 acres and the total water surface is 1,820 acres. Common mammals are wild pigs, coyotes, blacktail deer, tule elk, ground squirrels and black-tailed jackrabbits. Canada geese, bald eagles, a wide variety of ducks and bird species, and the special status tri-colored blackbird can be seen around the reservoir. East Park Reservoir provides opportunities for camping, boating, picnicking and fishing.

American Land Conservancy

BEAR VALLEY RANCH. A conservation easement over the 16,513-acre Bear Valley Ranch was acquired by the American Land Conservancy in 2001. The conservation easement permanently precludes development on the property, while permitting traditional cattle ranching. The ranch is known as having one of the state's most spectacular wildflower displays. This conservation easement was funded by the California Wildlife Conservation Board and the David and Lucile Packard Foundation. The easement is monitored by California Rangeland Trust.

SULPHUR CREEK. The American Land Conservancy acquired 1,531 acres in the Sulphur Creek valley in 1999. The Sulphur Creek valley is part of a 6,500-acre watershed located in the coastal range. From 2002 to 2005, the American Land Conservancy oversaw a three-year restoration effort on the property that was funded by the California Wildlife Conservation Board. The area was once heavily mined for gold, but is now known for the natural hot springs that are part of the historic Wilbur Hot Springs resort. The American Land Conservancy sold the resort to subject to a conservation easement that precludes development of the land and protects the oak woodlands, grasslands and riparian habitat.

PAYNE RANCH. A conservation easement over the 3,140-acre Payne Ranch was acquired by the American Land Conservancy in 2006. Payne Ranch is a private working cattle ranch in Colusa County. The southern border of the Payne Ranch is contiguous to 27,245 acres specially-designated as the Cache Creek Wilderness Area, home to one of the largest free roaming Tule Elk populations in California, the second largest wintering bald eagle population in the state, as well as numerous rare and endangered plant and animal communities. The conservation easement conserves the agricultural, ecological, and scenic resources of the property while contributing to the environmental health of the surrounding 70,000-acre Cache Creek Natural Area. The Payne Ranch connects to two other American Land Conservancy projects in the region – Bear Valley Ranch and Sulphur Creek, which together conserve nearly 20,000 acres that contribute to the region's rich biodiversity. The conservation easement was funded by the California Wildlife Conservation Board.

National Forests

Mendocino National Forest. The Mendocino National Forest is 913,306 acres and lies in parts of six counties, including Colusa, Lake, Glenn, Mendocino, Tehama, and Trinity. Elevations in the Forest range from 750 feet to 8,092 feet, with the average elevation about 4,000 feet. An estimated 60,000 acres of old growth occur here, including forests of Douglas-fir, Ponderosa Pine, White Fir, Tanoak, and Pacific

madrone. The Mendocino National Forest is the only one of California's 18 national Forests that are not crossed by a paved road or highway and it is attractive to people seeking outdoor recreation. The Forest provides resources through logging and grazing, in addition to its recreational activities.

Rivers

Sacramento River. The Sacramento River traverses the eastern portion of Colusa County in a north-south direction, stretching from the northern county border to the southern county border. South of the City of Colusa, the Sacramento River generally demarcates the County's eastern boundary. The Sacramento River corridor in Colusa County provides numerous opportunities for recreational activities such as hiking, camping, hunting, fishing, boating and other water sports. The river corridor is home to countless plant, animal and aquatic species and numerous habitat types. Areas of the river corridor have been developed with parks and boat launch facilities to provide for public access to the river. The Sacramento River feeds, and is fed by, numerous creeks, streams and tributaries throughout Colusa County and neighboring Counties.

6.5 AIR QUALITY

This section discusses the overall regulatory framework for air quality management in California and the region, including national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), and describes existing air quality conditions in Colusa County. This section also includes a discussion of climate change and greenhouse gasses. Information presented in this section is based in part on information gathered from the Colusa County Air Pollution Control District (APCD) and the California Air Resources Board (CARB).

REGULATORY SETTING

FEDERAL REGULATIONS

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

Energy Policy Act of 1992 (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Federal Climate Change Policy

According to the EPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The federal government's goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR", "Climate Leaders", and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

STATE REGULATIONS

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible

for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code [§39606(b)], which are similar to the federal standards.

Air Quality Standards

NAAQS are determined by the EPA. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM₁₀) and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 6.5-1.

Like the EPA, CARB also designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant in air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as nonattainment.

CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

Tanner Air Toxics Act

California regulates Toxic Air Containments (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses.

These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

California Strategy to Reduce Petroleum Dependence (AB 2076)

AB 2076 (Chapter 936, Statutes of 2000) requires the California Energy Commission (CEC) and the CARB to develop and submit to the Legislature a strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation energy efficiency as well as the use of non-petroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles.

The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce inroad gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles; and increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

Assembly Bill 1493

In 2002, then Governor Gray Davis signed AB 1493. AB 1493 required the CARB to develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state.” To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California’s existing motor vehicle emission standards in 2004.

Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24 percent between 2009 and 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufactures filed suit against the CARB to prevent enforcement of CCR 13 1900 and CCR 13 1961 as amended by AB 1493 and CCR 13 1961.1 (Central Valley Chrysler-Jeep et al., v. Catherine E. Witherspoon, in her official capacity as Executive Director of the California Air Resources Board et al.). The suit, being heard in the U.S. District Court for the Eastern District of California, contends that California’s implementation of regulations that in effect regulate vehicle fuel economy violates various federal laws, regulations, and policies.

On December 21, 2005, CARB requested a waiver of federal preemption of California's Greenhouse Gas Emissions Standards. The waiver would allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles. The waiver was requested after the CARB developed regulations based on AB 1493. In November 2007, California filed a lawsuit against the EPA for failing to act on California's tailpipe emissions waiver request, which the EPA then responded to by rejecting California's waiver request. California filed a lawsuit to reverse the EPA's decision in January 2008. Subsequently, in 2009 the EPA reconsidered the waiver request and granted a waiver to implement its greenhouse gas emissions standards for cars after a three and a half year period.

California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change.

CARB, which is part of Cal-EPA, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining state ambient air quality standards as set forth in the California Clean Air Act of 1988. In addition to developing regulations, CARB develops motor vehicle emission standards for California vehicles.

Assembly Bill 1007

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) required the California Energy Commission to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The Energy Commission prepared the plan in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. In preparing the State Alternative Fuels Plan, the Committee incorporated and built on the work by the Bio-Energy Interagency Working Group, the work of other agencies, and also examined the broader suite of alternative fuels that could benefit California's transportation market.

As required by Assembly Bill 1007, the State Alternative Fuels Plan (Plan) presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Bioenergy Action Plan – Executive Order #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

Governor’s Low Carbon Fuel Standard (Executive Order #S-01-07)

Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard shall be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

Climate Action Program at Caltrans

In December 2006, Caltrans issued a Climate Action Program. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO₂ from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that “the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards).”

Senate Bill 97 (SB 97)

Senate Bill 97 was signed by the Governor on August 24, 2007. This bill would provide that in an environmental impact report, negative declaration, mitigated negative declaration, or other document required by CEQA for either transportation projects funded under the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or projects funded under the Disaster Preparedness and Flood Prevention Bond Act of 2006, the failure to analyze adequately the effects of greenhouse gas emissions otherwise required to be reduced pursuant to regulations adopted under the Global Warming Solutions Act of 2006 does not create a cause of action for a violation of CEQA. The bill would provide that this provision shall apply retroactively for any of the above documents that are not final and shall be repealed on January 1, 2010.

The bill would require the OPR, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation

or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. The OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to the California Global Warming Solutions Act of 2006.

Senate Bill 375

SB 375 requires the CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The 18 MPOs in California will prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled (VMT) in their respective regions and demonstrate the ability for the region to attain CARB's targets. CARB would later determine if each region is on track to meet their targets. Builders also would get relief from certain environmental reviews under California Environmental Quality Act if they build projects consistent with the new sustainable community strategies. In addition, cities would get extra time -- eight years instead of five -- to update housing plans required by the state.

LOCAL AND REGIONAL REGULATIONS

Northern Sacramento Valley Air Quality Attainment Plan

As specified in the California Clean Air Act of 1988 (CCAA), Chapters 1568-1588 it is the responsibility of each air pollution control district and air quality management district within the State to attain and maintain California's ambient air quality standards. The CCAA requires that an Attainment Plan (Plan) be developed by all non-attainment districts for ozone (O₃), carbon monoxide (CO), sulfur oxides (SO_x), and nitrogen oxides (NO_x) that are either receptors or contributors of transported air pollutants. The purpose of the Plan is to comply with the requirements of the CCAA as implemented through the California Health and Safety Code. Districts are required to update the Plan every three years.

The Northern Sacramento Valley (NSV) is classified as a moderate nonattainment area for State 1-hour ozone standard. The NSV comprises the northern portion of the Sacramento Valley Air Basin and includes the counties of Butte, Colusa, Glenn, Tehama, Shasta and the northern portions of Yuba & Sutter. The NSV is generally rural in nature, with a low population density and a predominately agricultural economy. Its industrial base is dominated by agricultural/construction support operations, although small scale manufacturing is also found throughout the region.

Health and Safety Code section 41503(b) requires that control measures for the same emission sources be uniform throughout the air basin. To meet this requirement the NSV has coordinated the development of the Plan and established specific rule adoption protocols through the Technical Advisory Committee (TAC) of the Sacramento Basinwide Control Council.

The Plan was initially submitted to CARB on September 16, 1991. CARB held a public hearing on the Plan on July 9, 1992 and found the Plan to conform to several elements of the CCAA, but also identified several deficiencies. CARB gave conditional approval of the Plan to allow time for completing plan modifications after consultation with the districts. The Plan includes the all feasible control measures applicable to the NSV, emission accounting and ranking of measures by cost-effectiveness, and provisions to develop area and indirect source control measures. The Plan did not fully satisfy the CCAA requirement for permitting rules and several districts did not make the cost-effectiveness findings.

After evaluating the progress achieved with the 1991 Plan, the NSV shifted the primary emphasis from the adoption of stationary source control measures to motor vehicle emission reductions. Because mobile sources are the single largest contributor to ozone pollution, the 1994 Plan concentrated on

reducing these emissions through the implementation of Indirect Source Review (ISR) programs and Transportation Control Measures (TCMs). Several stationary source measures previously considered in the 1991 Plan were deemed not applicable or not offering cost-effective emission control and were removed from the list.

The 1997 triennial update to the Plan addressed the progress made implementing the 1994 Plan and proposed modifications to the strategies necessary to attain the State ozone standard at the earliest practicable date. Like the 1994 Plan, the 1997 Plan focused on the adoption and implementation of control measures for stationary sources, mobile sources, area wide sources, indirect sources and addressed public education programs. The Plan also addressed the transport of pollutants from the upwind metropolitan areas to the NSV. With the State Implementation Plan (SIP) as the state's established control strategy for the future, the CARB found that the NSV districts would not be required to prepare a comprehensive plan update for 1997. Instead, districts were directed to focus on implementing their existing control strategies and SIP commitments.

As with the 1997 Plan, the 2000 and 2003 Plan were focused on implementing existing control strategies and SIP commitments. In the 2000, 2003 and 2006 Plan updates, districts endeavored to incorporate three general principles to guide them in their planning process: (1) Air quality modeling to identify the reductions needed and to design effective emission reduction strategies; (2) Comprehensive emission reduction programs that take advantage of current emission control technologies; and (3) Address the impacts of pollutant transport in the attainment demonstration.

Colusa County Air Pollution Control District

The mission of the Colusa County Air Pollution Control District is to protect the public health while balancing economic and air quality considerations.

The District is governed by a five member Board of Directors. All five Board members are County Supervisors. The Air Pollution Control Officer is appointed by the Board and serves as Executive Director of the District. The Board of Directors appoints five citizens to the District's Hearing Board, which considers appeals for rule variances and other similar matters. The Hearing Board is a quasi-judicial body.

The Board of Directors also appoints an Air District Advisory Committee to discuss and advise the Board and District staff on general air quality programs and issues.

As required by the state and federal Clean Air Act, the District is responsible for air monitoring, permitting, enforcement, long-range planning, regulatory development, education, and public information activities related to air quality. Local districts are the primary mechanism for air quality management. Districts must implement rules and regulations and provide enforcement for the attainment and maintenance of the California and national ambient air quality standards.

Colusa County General Plan

The existing Colusa County General Plan includes the following policies related to air quality:

CO-11 Future air quality shall be maintained by continuing to encourage a compact development pattern and by encouraging alternative modes of transportation (transit, bicycle, and pedestrian).

CO-12 A Colusa County Non-Attainment Plan shall be developed and implemented if and when Colusa County no longer meets state and national air quality standards.

SACRAMENTO VALLEY AIR BASIN

County County is located within the Sacramento Valley Air Basin (SVAB). The SVAB is the northern half of California's Great Valley and is bordered on three sides (west, north, and east) by mountain ranges, with peaks in the eastern range above 9,000 feet. Figure 6.5-1 delineates the boundary of the SVAB. The SVAB is approximately 13,700 square miles and essentially a smooth valley floor with elevations ranging from 40 to 500 feet. The rolling valley is interrupted by the Sutter Buttes, an area of 80 square miles in northern Sutter County, which rise abruptly to more than 2,100 feet above the valley floor.

The SVAB consists of 13 counties and is split into two planning sections based on the degree of pollutant transport from one area to the other and the level of emissions within each area. The Colusa County area belongs to the Northern Sacramento Valley Air Basin (NSVAB), which is composed of the seven northern-most counties of the SVAB. These counties include Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba.

The NSVAB has been categorized as "moderately" non-attainment for ozone and particulate matter under the state standards. The air basin of the Sacramento Valley is about 200 miles long in a north-south direction, and has a maximum width of about 150 miles, although the width of the valley floor only averages about 50 miles.

Air Movement

The Sacramento Valley portion of the air basin forms a bowl, bounded on the west by the Coast Ranges, on the north by the Cascade Range, and on the east by the Sierra Nevada. These mountain ranges reach heights exceeding 7,000 feet above sea level. During summer, the wide, flat expanse of the Sacramento Valley provides an ideal environment for the formation of photochemical smog. Moreover, the prevailing winds in the Sacramento Valley blow from south to north, driven by the marine air traveling through the Carquinez Strait. These winds can transport pollutants from the broader Sacramento area and from the San Francisco Bay Area to the Northern Sacramento Valley Air Basin. The mountain ranges that surround the Northern Sacramento Valley Air Basin provide a physical barrier to continued movement of the air mass, significantly hindering the dispersal of pollutants.

Generally, the County experiences moderate to very poor capability to disperse pollutants nearly 80 percent of the time. This is, in large measure, due to the relatively stable atmosphere which acts to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to pollutants. In valley locations under 1,000 ft, they create a "lid" under which pollutants are trapped. Dust and other pollutants can become trapped within these inversion layers and will not disperse until atmospheric conditions become more unstable. This situation creates concentrations of pollutants at or near the ground surface which pose significant health risks for plants, animals, and people.

Inversions occur in the SVAB with great frequency in all seasons. The most stable inversions occur in late summer and fall. The summertime inversions are often the result of marine air pushing under an overlying warm air mass. These are termed "marine inversions" and are generally accompanied by brisk afternoon winds, which provide good air circulation.

In contrast, many autumn inversions are the result of warm air subsiding in a high-pressure cell where accompanying light winds do not provide adequate dispersion. Autumn inversions limit vertical mixing,

creating a very stable layer of air with very light or calm winds. These inversions are usually present on clear cold nights during late fall and winter. In the morning, these ground based inversions are weakened and eventually eliminated by solar heating. As a result, they are strongest in the late night and early morning, when ground-level temperatures are coldest and solar radiation is low.

Seasonal Pollution Variations

Carbon monoxide, oxides of nitrogen, particulate matters, and lead particulate concentrations in the late fall and winter are highest when there is little interchange of air between the valley and the coast and when humidity is high following winter rains. This type of weather is associated with radiation fog, known as tule fog, when temperature inversions at ground level persist over the entire valley for several weeks and air movement is virtually absent.

Pollution potential in the Colusa County area is relatively high due to the combination of air pollutant emissions sources, transport of pollutants into the area and meteorological conditions that are conducive to high levels of air pollution. Elevated levels of particulate matter (primarily very small particulates or PM₁₀) and ground-level ozone are of most concern to regional air quality officials.

Local carbon monoxide "hot spots" are important to a lesser extent. Ground-level ozone, the principal component of smog, is not directly emitted into the atmosphere but is formed by the reaction of reactive organic gases (ROG) and nitrogen oxides (NO_x) (known as ozone precursor pollutants) in the presence of strong sunlight. Ozone levels are highest in Colusa County during late spring through early fall, when weather conditions are conducive and emissions of the precursor pollutants are highest.

Surface-based inversions that form during late fall and winter nights cause localized air pollution problems (PM₁₀ and carbon monoxide) near the emission sources because of poor dispersion conditions. Emission sources are primarily from automobiles. Conditions are exacerbated during drought-year winters.

CRITERIA POLLUTANTS

The EPA uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Each criteria pollutant is described below.

Ozone (O₃) is a photochemical oxidant and the major component of smog. While O₃ in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O₃ at ground level are a major health and environmental concern. O₃ is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O₃ levels occur typically during the warmer times of the year. Both VOCs and NO_x are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents.

The reactivity of O₃ causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O₃ not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O₃ for several hours at relatively low concentrations has been found to significantly

reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks.

Nitrogen dioxide (NO₂) is a brownish, highly reactive gas that is present in all urban atmospheres. NO₂ can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O₃) and acid rain, and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO₂ in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO_x). NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O₃. NO_x forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

Sulfur dioxide (SO₂) affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. SO₂ is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO₂ results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

Particulate matter (PM) includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO₂ and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO₂) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

Respirable particulate matter (PM₁₀) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter in Colusa County is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM₁₀ causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

Fine particulate matter (PM_{2.5}) consists of small particles, which are less than 2.5 microns in size. Similar to PM₁₀, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also

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formed through the reaction of other pollutants. As with PM₁₀, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the EPA created new Federal air quality standards for PM_{2.5}.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment.

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

ODORS

Typically odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

NATURALLY OCCURRING ASBESTOS

The EPA Region 9 office is working in areas of California to address concerns about potential effects of naturally occurring asbestos. Naturally occurring asbestos can take the form of long, thin, separable fibers. Natural weathering or human disturbance can break naturally occurring asbestos down to microscopic fibers, easily suspended in air. There is no health threat if asbestos fibers in soil remain undisturbed and do not become airborne. When inhaled, these thin fibers irritate tissues and resist the

body's natural defenses. Asbestos, a known carcinogen, causes cancers of the lung and the lining of internal organs, as well as asbestosis and other diseases that inhibit lung function.

Asbestiform minerals occur naturally in rock and soil as the result of natural geologic processes, often in veins near earthquake faults in the coastal ranges and the foothills of the Sierra Nevada mountains. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in bodies of ultramafic rock or along their boundaries. Asbestos is much less likely to be associated with non-ultramafic rock types.

Ultramafic rocks are igneous rocks that form in high temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite, a type of metamorphic rock. Asbestos is the generic term for the naturally occurring fibrous (asbestiform) varieties of six silicate minerals, including chrysotile which is found in serpentinite and is the most common in California.

Serpentinite is an ultramafic rock that has a greasy or waxy appearance and may be dark to light green, brown, yellow or white. Small amounts of chrysotile asbestos are common in serpentinite. Other forms of asbestos such amphibole asbestos also occur with serpentinite, but such occurrences are less common than chrysotile asbestos.

Because of the correlation of asbestos and ultramafic rocks, the location of ultramafic rocks provides insight to the potential for naturally occurring asbestos in each county. The California Department of Conservation, Division of Mines and Geology mapped the location of ultramafic rocks within California, which is limited to the foothill regions of the Sierra Nevada, Coastal Range, and Cascade Range.

SENSITIVE RECEPTORS

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals and schools.

AMBIENT AIR QUALITY

Both the EPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and state ambient air quality standards are summarized in Table 6.5-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the state standards are more stringent. This is particularly true for ozone and particulate matter between 2.5 and 10 microns in diameter.

TABLE 6.5-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	--	0.09 ppm
	8-Hour	0.075 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm

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TABLE 6.5-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Nitrogen Dioxide	Annual	--	0.03 ppm
	1-Hour	0.53 ppm	0.18 ppm
Sulfur Dioxide	Annual	0.03 ppm	--
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	--	0.25 ppm
PM10	Annual	--	20 ug/m3
	24-Hour	150 ug/m3	50 ug/m3
PM2.5	Annual	35 ug/m3	12 ug/m3
	24-Hour	15 ug/m3	--
Lead	30-Day Avg.	--	1.5 ug/m3
	3-Month Avg.	1.5 ug/m3	--

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2008

Notes: ppm = parts per million, ug/m3 = Micrograms per Cubic Meter

The EPA established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The 1-hour ozone standard was phased out and replaced by an 8-hour standard of 0.075 ppm. Implementation of the 8-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U.S. Supreme Court in a decision issued in February of 2001.

In 1997, new national standards for fine particulate matter diameter 2.5 microns or less (PM_{2.5}) were adopted for 24-hour and annual averaging periods. The current PM₁₀ standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, CARB staff recommended lowering the level of the annual standard for PM₁₀ and establishing a new annual standard for PM_{2.5}. The new standards became effective on July 5, 2003, with another revision on November 29, 2005.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within Colusa County and the entire NSVPA are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

It should be noted that Colusa County is subject to significant ozone transport from the Sacramento area.

Attainment Status

In accordance with the California Clean Air Act (CAA), the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the

applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The EPA designates areas for ozone (O₃), carbon monoxide (CO), and nitrogen dioxide (NO₂) as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For sulfur dioxide (SO₂), areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

Colusa County has a national designation for either Unclassified or Attainments for all criteria pollutants. The County has a state designation as “moderately” non-attainment for ozone and non-attainment for PM₁₀. The County is designated either attainment or unclassified for the remaining state standards.

TABLE 6.5-2: STATE AND NATIONAL ATTAINMENT STATUS

Criteria Pollutants	State Designations	National Designations
8-Hour Ozone	Nonattainment/Transitional	Unclassified/Attainment
PM10	Nonattainment	Unclassified
PM2.5	Attainment	Unclassified/Attainment
Carbon Monoxide	Unclassified	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Standard
Lead	Attainment	No Federal Standard
Hydrogen Sulfide	Unclassified	No Federal Standard
Visibility Reducing Particles	Unclassified	No Federal Standard

SOURCES: CALIFORNIA AIR RESOURCES BOARD (2010). WWW.ARB.CA.GOV/DESIG/ADM/ADM.HTM

Air Quality Monitoring

The Colusa County APCD and CARB maintain one air quality monitoring site in Colusa County, located on Sunrise Blvd. in the City of Colusa. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. Data obtained from the Colusa monitoring site over the last 3-year period is shown in **Table 6.5-3**.

TABLE 6.5-3: AMBIENT AIR QUALITY MONITORING DATA (COLUSA- SUNRISE BLVD.)

Pollutant	Cal.	Fed.	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
	Primary Standard				
Ozone (O ₃) (1-hour)	0.09 ppm for 1 hour	NA	2006	0.084	0/NA
			2007	0.080	0/NA
			2008	0.091	0/NA

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TABLE 6.5-3: AMBIENT AIR QUALITY MONITORING DATA (COLUSA- SUNRISE BLVD.)

Ozone (O ₃) (8-hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hour	2006	0.077	2/1
			2007	0.068	0/0
			2008	0.082	6/1
Particulate Matter (PM ₁₀)	50 ug/m ³ for 24 hours	150 ug/m ³ for 24 hours	2006	69.0	*/*
			2007	43.0	0/0
			2008	90.3	62.4/0
Fine Particulate Matter (PM _{2.5})	No 24 hour State Standard	35 ug/m ³ for 24 hours	2006	61.0	NA/2.9
			2007	58.0	NA/0
			2008	169.6	NA/*

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2006, 2007, AND 2008.

NOTES:

PPM = PARTS PER MILLION.

UG/M³ = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE

CLIMATE CHANGE AND GREENHOUSE GASSES

Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), ozone (O₃), water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs).

Human-caused emissions of these GHGs, in excess of natural ambient concentrations, are responsible for enhancing the greenhouse effect (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006a).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO₂ in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (California Energy Commission 2006a).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon

dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (California Energy Commission 2006a). This category was followed by the electric power sector (including both in-state and out of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (California Energy Commission 2006a).

Effects of Global Climate Change

The effects of increasing global temperature are far reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs is anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to a California Energy Commission report, the snowpack portion of the supply could potentially decline by 70 to 90 percent by the end of the 21st century (CEC 2006c). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and, according to the CEC report, it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (CEC 2006c). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (CEC 2006c). As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (California Climate Change Center 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

PUBLIC HEALTH. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25 to 35 percent under the lower warming range, to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or

6. CONSERVATION AND NATURAL RESOURCES

below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

WATER RESOURCES. A vast network of man-made reservoirs and aqueducts capture and transport water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25 percent of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as 1 month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70 to 90 percent. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

AGRICULTURE. Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development will change, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

FORESTS AND LANDSCAPES. Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30 percent toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90 percent.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

RISING SEA LEVELS. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

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7. ECONOMIC DEVELOPMENT

This section provides an overview of Colusa County's economy, including employment and labor force characteristics, primary industry sectors, major employers, taxable sales, and spending patterns. The analysis generally discusses current data (2009), 2000 Census data, and trends over the past 10 years. Section 1.2, Agriculture, discusses economic data specific to the County's agricultural industry.

EMPLOYMENT CHARACTERISTICS

Labor Force

Since 2000, Colusa County has seen an increase in population from 18,804 to 22,162 persons countywide, an increase of 3,358 persons or 17.9 percent. During this same time period, the County's labor force has increased from 9,260 to 11,470, 2,210 persons or 23.9 percent. Over the past 10 years, the unemployment rate in Colusa County has fluctuated from a low of 11.5 percent in 2000 to a high of 18.4 percent in 2009 as shown in Table 7-1. The high in 2009 was also accompanied by a commensurate increase in the total labor force. The total number of employed persons in the County has increased steadily since 1999, with an exception from 2000 to 2001 which saw a slight decrease of 230 employed persons.

Table 7-1 identifies the annual average employment. There is substantial seasonal employment, which results in fluctuations in the employment rate on a monthly basis, which is primarily related to the agricultural industry.

TABLE 7-1: LABOR FORCE AND EMPLOYMENT

Year*	Labor Force	Employed	Unemployed	% Unemployed	% Change
2009	11,470	9,370	2,100	18.4%	44.8%
2008	10,550	9,100	1,450	13.7%	10.7%
2007	10,300	9,100	1,200	11.9%	-4.2%
2006	10,000	8,800	1,200	12.4%	-3.9%
2005	9,900	8,600	1,300	12.9%	-6.2%
2004	9,550	8,240	1,310	13.7%	4.4%
2003	9,510	8,140	1,370	14.4%	4.6%
2002	9,450	8,140	1,310	13.9%	12.0%
2001	9,130	7,960	1,170	12.8%	9.3%
2000	9,260	8,190	1,070	11.5%	-23.5%
1999	8,730	7,330	1,400	16.0%	-21.3%

SOURCE: CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT, 2010

Job growth was estimated to increase at a modest rate of 0.9 percent annually from 2000 to 2009. The annual average job growth rate is less than the population growth rate, 0.9 percent versus 1.8 percent respectively from 2000 to 2009. Table 7-2 identifies estimated job growth from 2000 to 2009.

In 2000, there were 3,719 workers in the unincorporated County; 2,805 workers were employed in the County and 914 persons worked outside of the County. In 2000, there were 3,786 jobs in unincorporated Colusa County, meaning that the County imported 981 workers.

7. ECONOMIC DEVELOPMENT

TABLE 7-2: PROJECTED JOBS

	2000	2009
Unincorporated Colusa County	3,687	3,994
Percent Change		7.7%
Annual Percent Change		0.9%

SOURCE: ESRI, 2009

In the unincorporated County, most workers are employed with services positions (21 percent), with management, business, and financial operation positions and professional and related occupations the second highest types of positions held by employees. Professional, administrative support, and farming, fishing and forestry occupations each represent just over one out of 10 workers. Table 7-3 identifies jobs by occupation; please note that these occupations may be held in a variety of industries. For example, both a farm operation and retail business may have employees with a variety of occupations, such as management, administrative support, service, and transportation staff.

TABLE 7-3: JOBS BY OCCUPATION (2009)

	Number	Percent
Management, Business, and Financial Operations	634	16%
Professional and Related Occupations	496	12%
Sales	280	7%
Administrative Support	436	11%
Services	844	21%
Farming, Fishing, and Forestry	443	11%
Construction/Extraction	180	5%
Installation, Maintenance, and Repair	204	5%
Production	164	4%
Transportation and Material Moving	324	8%

SOURCE: ESRI, 2009

Industry and Occupation

County-wide, the services industry employs the majority of employees, followed by the farm industry. Table 7-4 summarizes industry employment trends (subsets of individual industries are shown in italics) for Colusa County from 1990 to 2009. During this period, the most significant rate of employment growth occurred in the government services industry, with local government employment increasing by 81 percent. The services industry has also shown strong growth, 39 percent. Within the services industry, there has been a significant increase in wholesale trade employment, 600%, while retail trade and transportation/warehousing/utilities decreased 17 percent and 13 percent respectively. Chart 7-1 shows the distribution of jobs within the services industry from 2008 to 2009. The farm industry has shown a slight decrease in its share of overall employment, from 34 percent in 1990 to 30 percent in 2009, but has shown 10 percent growth in the total number of employees.

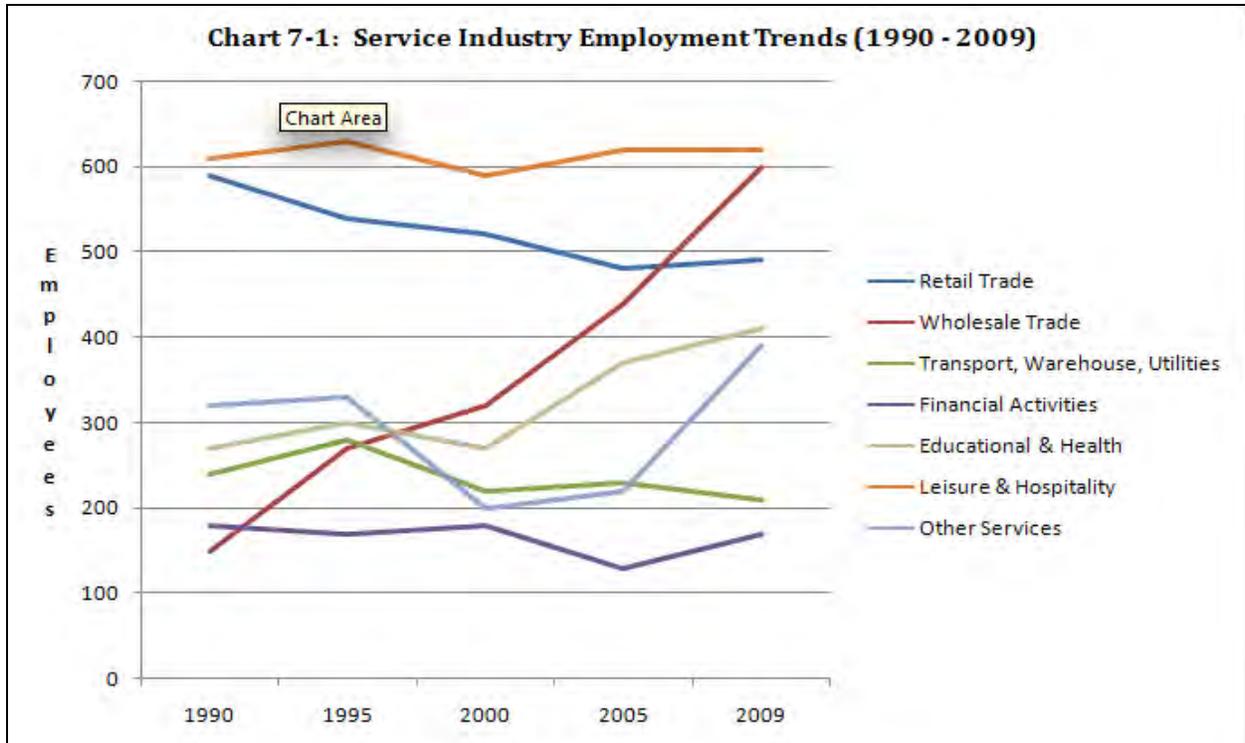
7. ECONOMIC DEVELOPMENT

TABLE 7-4: INDUSTRY EMPLOYMENT TRENDS

	1990		1995		2000		2005		2009		Total Change 1990- 2009
	Number	Percent									
Farm	2,280	34%	2,400	35%	2,560	34%	2,460	31%	2,510	30%	10%
Goods Producing	830	12%	730	11%	970	13%	980	12%	920	11%	11%
<i>Mining, Logging, and Construction</i>	220	3%	70	1%	100	1%	130	2%	110	1%	-50%
<i>Manufacturing - Durable Goods</i>	240	4%	160	2%	230	3%	30	0%	30	0%	-88%
<i>Manufacturing - Nondurable Goods</i>	370	6%	490	7%	650	9%	830	11%	790	9%	114%
Service Providing	3,610	54%	3,830	55%	4,070	54%	4,440	56%	5,010	59%	39%
<i>Wholesale Trade</i>	150	2%	270	4%	320	4%	440	6%	600	7%	300%
<i>Retail Trade</i>	590	9%	540	8%	520	7%	480	6%	490	6%	-17%
<i>Transportation, Warehousing & Utilities</i>	240	4%	280	4%	220	3%	230	3%	210	2%	-13%
<i>Financial Activities</i>	180	3%	170	2%	180	2%	130	2%	170	2%	-6%
<i>Educational & Health Services</i>	270	4%	300	4%	270	4%	370	5%	410	5%	52%
<i>Leisure & Hospitality</i>	610	9%	630	9%	590	8%	620	8%	620	7%	2%
<i>Other Services</i>	320	5%	330	5%	200	3%	220	3%	390	5%	22%
Government	1,260	19%	1,300	19%	1,770	23%	1,960	25%	2,110	25%	67%
<i>Federal Government</i>	120	2%	90	1%	90	1%	80	1%	80	1%	-33%
<i>State Government</i>	60	1%	50	1%	80	1%	60	1%	70	1%	17%
<i>Local Government</i>	1,080	16%	1,160	17%	1,600	21%	1,820	23%	1,960	23%	81%

SOURCE: CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT, 2010

7. ECONOMIC DEVELOPMENT



In the unincorporated areas, Colusa County's work force is employed in a broad range of industries, with agriculture, forestry, fishing and hunting accounting for 29 percent of jobs and educational, health and social services comprising 16 percent of jobs; while both manufacturing; and transportation, warehousing, and utilities each account for 8 percent. The top five occupation categories are services; professional and related occupations; management, business, and financial operations; farming, fishing, and forestry; and administrative support. In 2000, the services industry and agriculture, forestry, and related industry sectors each represented approximately 30 percent of industries. However, in the past nine years, this has shifted, with the services industry now representing 36 percent of industries, a 22 percent increase in employees, while employment in the agriculture and related industry has decreased by 5 percent and now represents 26 percent of all industries. With the exception of the manufacturing and the transportation, warehousing, and utilities industries, which showed a decrease in share of employment, other industries remained relatively stable. Table 7-5 summarizes unincorporated Colusa County's jobs by industry in 2000 and 2009.

TABLE 7-5: JOBS BY INDUSTRY

	2000		2009	
	Number	Percent	Number	Percent
Agriculture, forestry, fishing and hunting, and mining	1,095	29%	1,038	26%
Construction	186	5%	200	5%
Manufacturing	317	8%	225	6%
Wholesale trade	165	4%	164	4%
Retail trade	278	7%	318	8%
Transportation, warehousing, and utilities	293	8%	286	7%
Information	16	<1%	13	<1%
Finance, insurance, real estate, rental and leasing	94	3%	127	3%
Services	1,157	31%	1,421	36%
<i>Professional, scientific, management, administration</i>	129	3%	N/A	-
<i>Educational, health and social services</i>	599	16%	N/A	-
<i>Arts, entertainment, recreation, and services</i>	275	7%	N/A	-
<i>Other services</i>	154	4%	N/A	-
Public administration	185	5%	202	5%

SOURCE: US CENSUS, 2000; ESRI, 2009

Major Employers

Table 7-6 shows that the largest employers in Colusa County provide employment in the agricultural and/or services industries. The primary employers in Colusa County each have over 250 employees: Colusa County (government services) with 368 employees and Colusa Indian Community (entertainment services) with 550 employees. Ten employers have from 100 to 249 employees and 13 have from 50 to 99 employees. Of the major employers, 12 are industries related to agriculture and the remainder are food/entertainment services, local government, school districts, health services, and other services.

TABLE 7-6: MAJOR EMPLOYERS (COLUSA COUNTY)

Employer Name	Location	Industry	Employees*
Over 250 Employees			
Colusa Indian Community	Colusa	Casino/Entertainment	550
County of Colusa	Colusa	Local Government	368
100 to 249 Employees			
Colusa Regional Medical Center	Colusa	Health Services	117
California Family Food LLC	Arbuckle	Agriculture – Crop Preparation	100
Colusa Unified School District	Colusa	Education	150
De Pue Warehouse Co	Williams/Maxwell	Rice-Wholesale	100-249
Elvira Sandoval	Williams	Labor Contractor	170
Granzellas, Inc.	Williams	Restaurant/retail	130
Morning Star Trucking Co/ Morning Star Packing	Williams	Trucking and Tomato products, processing and packaging	100-249

7. ECONOMIC DEVELOPMENT

TABLE 7-6: MAJOR EMPLOYERS (COLUSA COUNTY)

Employer Name	Location	Industry	Employees*
Petersen Ranch Farms	Arbuckle	Farms	100-249
Premier Mushrooms LP	Colusa (CIP)	Mushrooms	100-249
T & P Farms	Arbuckle	Farms	100
50 to 99 Employees			
ACC-Gwg LLC	Williams	Rice Products	60
Adams Grain Co	Arbuckle	Trucking-Contract Hauling	50-99
Adams Vegetable Oils Inc	Arbuckle	Oils-Essential (Whls)	50-99
Alsco-Geyer Irrigation Inc	Arbuckle	Irrigation Design & Installation	70
American Rice Inc.	Maxwell	Rice Mill	60
California Family Foods LLC	Arbuckle	Rice Dryer, Storage & Mill	75
Colusa County Canning Co	Williams	Processing Consultants	50-99
Perinatal Outreach Ed Program	Colusa	Health Services	62
Pierce Union Joint Unified School District	Arbuckle	Education	70
Stadium Sports	Colusa	Department Stores	50-99
Sun Valley Rice Co LLC	Dunnigan	Rice Mill	98
Sunsweet Dryers River Bend	Colusa	Fruit & Vegetable Growers & Shippers	50-99
Valley West Care Ctr	Williams	Health Services	50-99

*FOR SOME EMPLOYERS, ONLY THE RANGE OF EMPLOYEES WAS AVAILABLE.

SOURCE: CENTER FOR ECONOMIC DEVELOPMENT, 2009; CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT, 2010; DE NOVO PLANNING GROUP, 2010

Travel to Work

The majority of unincorporated Colusa County residents, 53 percent, drove less than 20 minutes or more to work. Eight percent of residents drive more than 60 minutes to work. Most workers in unincorporated Colusa County, 68 percent, drive alone to work and 19 percent carpool. Four percent of residents work from home. Table 7-7 identifies travel time to work for unincorporated Colusa County residents and Table 7-8 identifies commute methods in 2000. Figure 7-1 illustrates Countywide travel occurring to and from Colusa County for employment purposes; this figure includes City of Colusa and Williams residents and employees in addition to the unincorporated areas.

TABLE 7-7: TRAVEL TIME TO WORK (2000)

	Number	Percent
Less than 10 minutes	1,061	29%
10-19 minutes	940	26%
20-24 minutes	439	12%
25-34 minutes	605	17%
35-59 minutes	354	10%
60+ minutes	288	8%

SOURCE: ESRI, 2009

TABLE 7-8: COMMUTE METHOD (2000)

	Number	Percent
Drive Alone	2,515	68%
Carpooled	715	19%
Public Transportation	4	0.1%
Walked	181	5%
Other	133	4%
Work at Home	140	4%

SOURCE: ESRI, 2000

SALES AND SPENDING

Taxable Sales

Taxable sales indicate the value of all transactions subject to sales tax. The California Board of Equalization publishes quarterly data regarding retail sales, total taxable sales, and the number of businesses with a sales tax permit. Total taxable sales do not reflect the gross sales since some transactions are not subject to sales tax. As shown in Tables 7-9 and 7-10, taxable sales increased by 48 percent from 2000 to 2008. While countywide, both retail sales and total taxable sales show steady increases since 2000, retail sales in the unincorporated area decreased by almost \$9 million from 2006 to 2008 and total taxable sales in the unincorporated area decreased by approximately \$33 million from 2000 to 2004, but have shown an overall increase of approximately \$35 million from 2000 to 2008.

TABLE 7-9: TAXABLE SALES (TOTAL COUNTY AND UNINCORPORATED COUNTY) 2000 - 2008

Year	Retail Sales		Total Taxable Sales	
	Total County	Unincorporated County	Total County*	Unincorporated County*
2008	\$160,177,000	\$50,579,000	\$328,738,000	\$178,486,000
2006	\$175,696,000	\$59,804,000	\$291,577,000	\$139,659,000
2004	\$153,732,000	\$49,380,000	\$245,004,000	\$111,416,000
2000	\$128,795,000	\$39,778,000	\$222,558,000	\$143,952,000

*APPROXIMATELY 15 TO 20 PERCENT OF TOTAL TAXABLE SALES THAT ARE NOT ALLOCATED TO EITHER CITY OR THE UNINCORPORATED COUNTY, SO THE TOTAL SALES FOR THE UNINCORPORATED COUNTY MAY BE UNDERCOUNTED

SOURCE: STATE BOARD OF EQUALIZATION, 2010

Table 7-10 identifies taxable sales by category for the unincorporated County in 2000 and 2008. The categories with the largest percentage increases in sales were, respectively: home furnishings and appliances (314 percent), service stations (187 percent), apparel (93 percent), other retail stores (88 percent), and non-retail businesses (80 percent). While the total number of sales tax permits increased by 5 percent, there was a 19 percent increase in permits for retail businesses and a 12 percent decrease in permits for non-retail businesses. Although the number of non-retail business permits decreased, this category still showed an 80 percent increase in taxable transactions.

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TABLE 7-10: TAXABLE SALES (UNINCORPORATED COUNTY) 2000-2008

	2000		2008		% Change in Permits	% Change in Taxable Transactions
	Sales Tax Permits	Taxable Transactions	Sales Tax Permits	Taxable Transactions		
Retail Stores						
Apparel	6	\$232,000	6	\$447,000	0%	93%
General Merchandise	7	\$3,870,000	9	\$4,776,000	29%	23%
Food	23	\$13,765,000	24	\$11,166,000	4%	-19%
Eating and Drinking Places	52	\$16,212,000	54	\$29,252,000	4%	80%
Home Furnishings and Appliances	4	\$249,000	11	\$1,098,000	175%	314%
Building Material and Farm Implements	24	\$23,968,000	20	\$10,262,000	-17%	-57%
Auto Dealers and Auto Supplies	20	\$35,707,000	21	\$35,200,000	5%	-1%
Service Stations	7	\$12,646,000	13	\$36,316,000	86%	187%
Other Retail Stores	71	\$22,146,000	96	\$41,660,000	35%	88%
Retail Totals	214	\$128,795,000	254	\$160,177,000	19%	24%
All Other Outlets (Non-retail)	283	\$93,763,000	250	\$168,561,000	-12%	80%
Totals	479	\$222,558,000	504	\$328,738,000	5%	48%

SOURCE: STATE BOARD OF EQUALIZATION, 2000; STATE BOARD OF EQUALIZATION, 2008

2009 Consumer Spending – Unincorporated Colusa County

Table 7-11 identifies consumer spending patterns in 2009 for the unincorporated county. Consumer spending data is from the ESRI Market Profile and represents the amount spent by households on a variety of goods and services. Expenditures are shown by broad budget categories that are not mutually exclusive. ESRI notes that consumer spending does not equal business revenue. For each of the categories, Table 7-11 identifies the total amount spent, average spent, and the spending potential index. The spending potential index (SPI) compares the amount spent in a specified area with the U.S. average. The SPI is useful in identifying categories where there is spending potential that is not being met. This information indicates that there is additional spending potential in the categories of apparel and services, education, and household furnishings. The SPI for shelter is also relatively low, which most likely represents that housing costs in Colusa County are moderate.

TABLE 7-11: CONSUMER SPENDING (2009)

Category	Spending
Apparel & Services: Total \$	\$5,047,832
Average Spent	\$1,316.56
Spending Potential Index	53
Computers & Accessories: Total \$	\$679,643
Average Spent	\$177.26
Spending Potential Index	78

TABLE 7-11: CONSUMER SPENDING (2009)

Category	Spending
Education: Total \$	\$2,957,214
Average Spent	\$771.29
Spending Potential Index	61
Entertainment/Recreation: Total \$	\$10,286,019
Average Spent	\$2,682.77
Spending Potential Index	83
Food at Home: Total \$	\$14,314,334
Average Spent	\$3,733.42
Spending Potential Index	82
Food Away from Home: Total \$	\$9,868,101
Average Spent	\$2,573.77
Spending Potential Index	77
Health Care: Total \$	\$12,558,623
Average Spent	\$3,275.50
Spending Potential Index	87
HH Furnishings & Equip: Total \$	\$5,792,896
Average Spent	\$1,510.89
Spending Potential Index	70
Investments: Total \$	\$4,968,191
Average Spent	\$1,295.79
Spending Potential Index	90
Retail Goods: Total \$	\$78,994,430
Average Spent	\$20,603.10
Spending Potential Index	80
Shelter: Total \$	\$43,222,842
Average Spent	\$11,273.26
Spending Potential Index	72
TV/Video/Sound Equipment: Total \$	\$3,603,416
Average Spent	\$939.83
Spending Potential Index	77
Travel: Total \$	\$5,413,984
Average Spent	\$1,412.06
Spending Potential Index	76
Vehicle Maintenance & Repairs: Total \$	\$2,992,371
Average Spent	\$780.46
Spending Potential Index	83

SOURCE: ESRI, 2009

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