RECOGNIZED AQUATIC AND WETLAND RESOURCES IN WESTERN PLACER COUNTY, CALIFORNIA

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Recognized Aquatic and Wetland Resources in Western Placer County

INTRODUCTION

Over the past 150 years, many of the natural communities in western Placer County have been converted to urban, rural, suburban, industrial, and agricultural uses. The County Planning Department, through the Placer Legacy program, is currently mapping and documenting what remains and what might be preserved. Vernal pool and riparian resources have been documented and mapped to some extent. Likewise, a considerable amount is known about the rivers, creeks, and streams. But, aside from the major reservoirs, little is known about the County's open water ponds. In addition, very little is known about the location and extent of non-vernal pool wetlands within western Placer County. Without this knowledge, planning for future development cannot accurately take into account the impact that development will have on wetlands in the area. To help fill this data gap, the County, with the help of an EPA grant, has funded a work program to map these under documented resources.

Before beginning the work, North Fork Associates prepared a Quality Assurance Project Plan (NFA, February 28, 2003) that was submitted to the County and the EPA. In general, we followed the methods described in Group B: Data Generation and Acquisition. In the early stages, North Fork Associates biologists provided the County with a detailed description of the habitat types and habitat attributes that would be mapped during the project. Once the photo-interpretation started, however, it became apparent that the level of effort needed to document the detailed attributes originally described far exceeded the constraints of both time allocation and budget. Consequently, the level of mapping detail was reduced to a scope that would fit within the time and budget framework of the EPA grant. This level of detail fits well with the existing Placer Legacy program and is described in the following sections.

GOALS AND OBJECTIVES

The primary goal of this study was to determine the location and extent of wetlands and open water habitats in western Placer County (Figure 1). To meet that goal, we mapped these features on aerial photographs, using USGS maps and aerial and ground surveys to check those results. The process is described in the Methods section. The criteria used for mapping are also discussed in the Methods section. All data were compiled in ArcView GIS for use by the County and other interested parties.

WETLAND CLASSIFICATION

No simple universal system is available for categorizing wetland types. To complicate matters further, not all wetlands in California are wet for 12 months. Most people recognize a marsh as a wetland because this type usually has standing water all year. But, vernal pools, which are special wetlands occurring in shallow depressions, are inundated during the winter and dry out by late spring or early summer. Seeps and other seasonal wetland may not exhibit surface inundation, but the soil is often saturated long enough to develop wetland indicators.

In a 1979 publication, Cowardin et al. developed a hierarchical system of classifying wetlands. The uppermost categories are marine, estuarine, riverine, lacustrine, and palustrine systems. Placer County does not have the first two systems, but it does have various types of the last three. Cowardin's system went on to describe lower levels of the hierarchy, but these levels are of little use when mapping large areas at relatively small scales.

All wetland and open water habitats in western Placer County were mapped as riverine, lacustrine, or palustrine. Riverine and lacustrine systems are open water habitats. That is, they are either too deep or have too much flowing water to support vegetation. Palustrine systems are wet, vegetated habitats. Riverine and lacustrine systems often have a palustrine component on the margins that is not strictly part of the riverine or lacustrine habitat. I some instances, features were so large and diverse that they could not be separated into components, and these were mapped as complexes. Figure 2 shows a small-scale map of the various wetland types overlaid on the USGS quadrangles. Figure 3 is a similar map overlaid on the mosaic of fall 2003 aerial photos. Also included on both figures are the vernal pool areas mapped in the early 1990s.

STUDY AREA

The study area, western Placer County, is defined roughly by Highway 49 and the American River on the east, Sacramento County to the south, Sutter County to the west, and Yuba County and Nevada County (roughly the Bear River) to the north. Figure 1 shows the study area on the USGS quadrangles for the region. The study area covers approximately 428 square miles and encompasses the rapidly growing cities of Roseville, Rocklin, and Lincoln.

Western Placer County can be divided into three geographic provinces. These areas are the valley floor, the lower foothills, and the upper foothills. The valley floor is generally considered the area west of State Route 65 and ranges in elevation from 40 to 150 feet. It is relatively flat and devoted to urbanization in the south and agricultural crops, primarily small grains such as rice and wheat, in other areas. There is a conspicuous lack of native woody vegetation in this area, other than along riparian corridors such as Auburn Ravine.

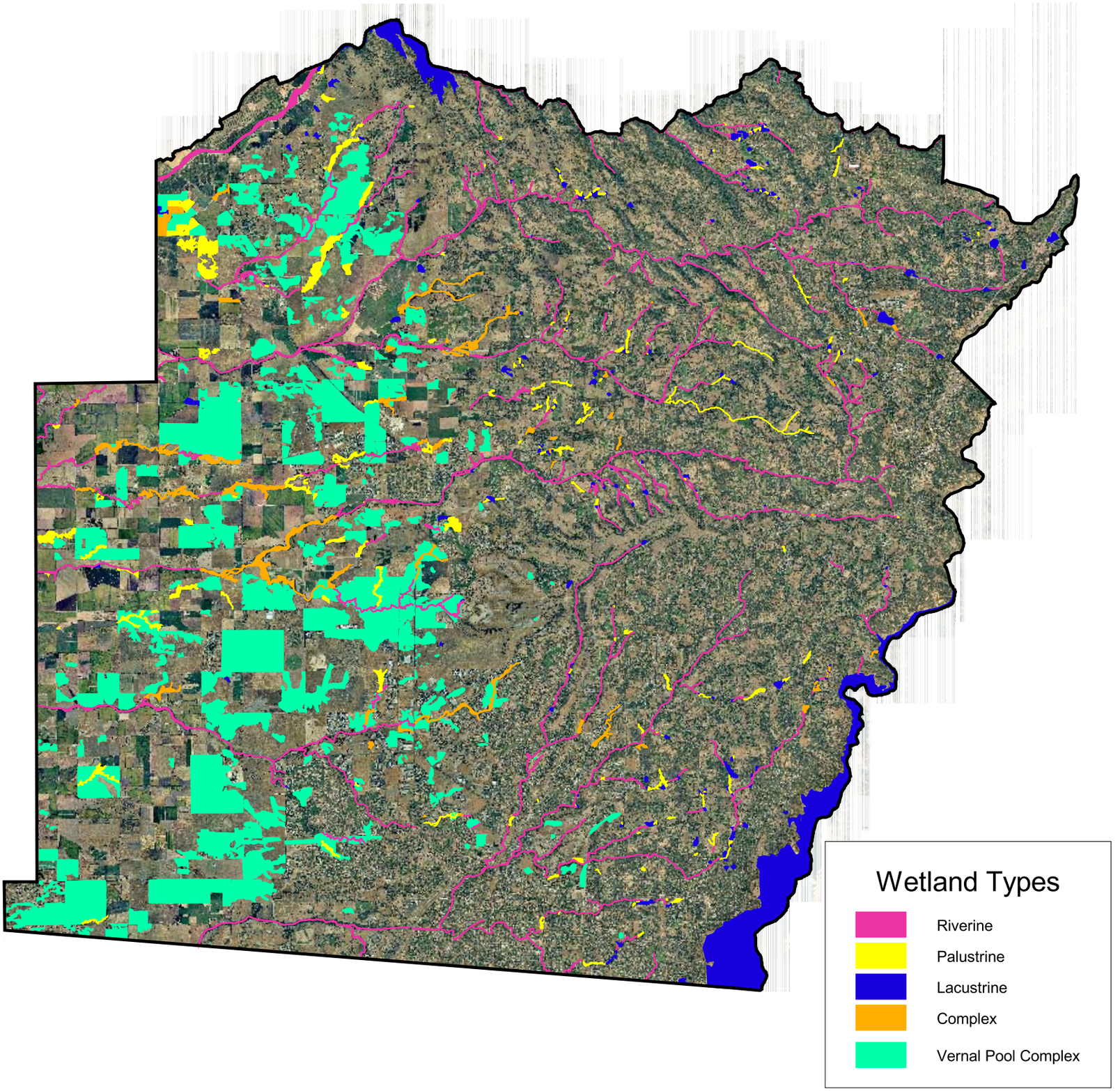
Somewhere east of Highway 65, the landscape changes from the flat valley to low undulating hills supporting grassland and oak woodland. It ranges in elevation from 150 to about 600 feet. This area was historically cattle country, and large portions of it are still devoted to that activity. However, much of it has been subdivided into smaller parcels ranging from one to twenty acres. The smaller parcels are often used for raising horses, orchards, and other activities.

The eastern portion of the study area from Loomis to Auburn north consists of the steeper Sierra Nevada foothills covered with various types of oak woodland. It ranges in elevation from 600 to 1,200 feet. This part of the county, too, has been subdivided into smaller parcels, although orchards and horse pastures are still common from State Highway 193 north.

WESTERN PLACER COUNTY ENVIRONMENT

Topography

Topography in western Placer County is varied (Figure 4). The western portion is nearly flat or gently sloping. The central portion consists of rolling foothills with several higher ridges running east to west. The higher portions in the northeast corner are more highly dissected



north fork associates

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Photos taken Fall of 2002
by AirPhoto USA

Figure 3

Recognized Aquatic
and Wetland Resources
in Western Placer County
with Aerial Photo Basemap

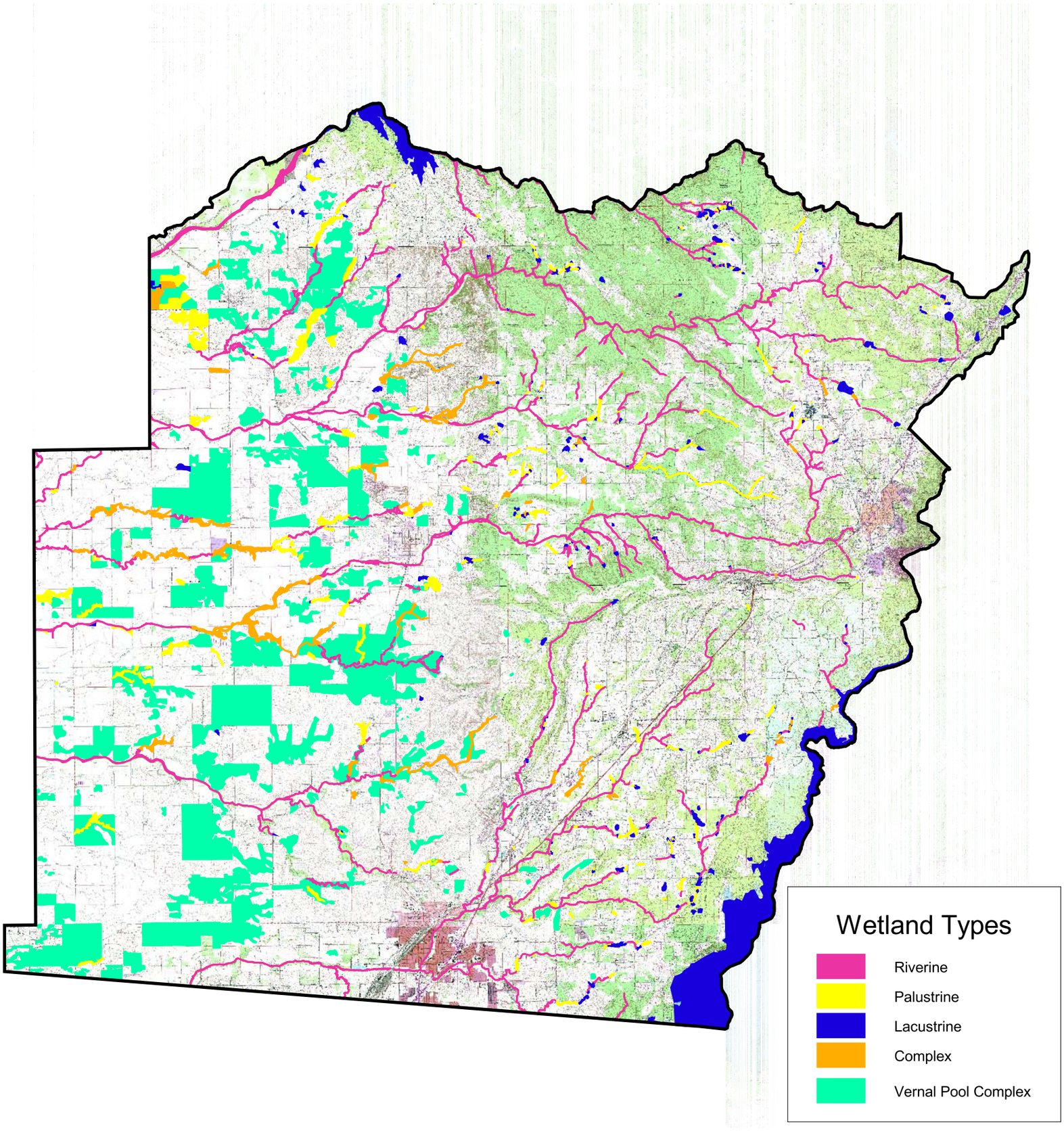

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Figure 2

Recognized Aquatic and Wetland Resources in Western Placer County with USGS Basemap

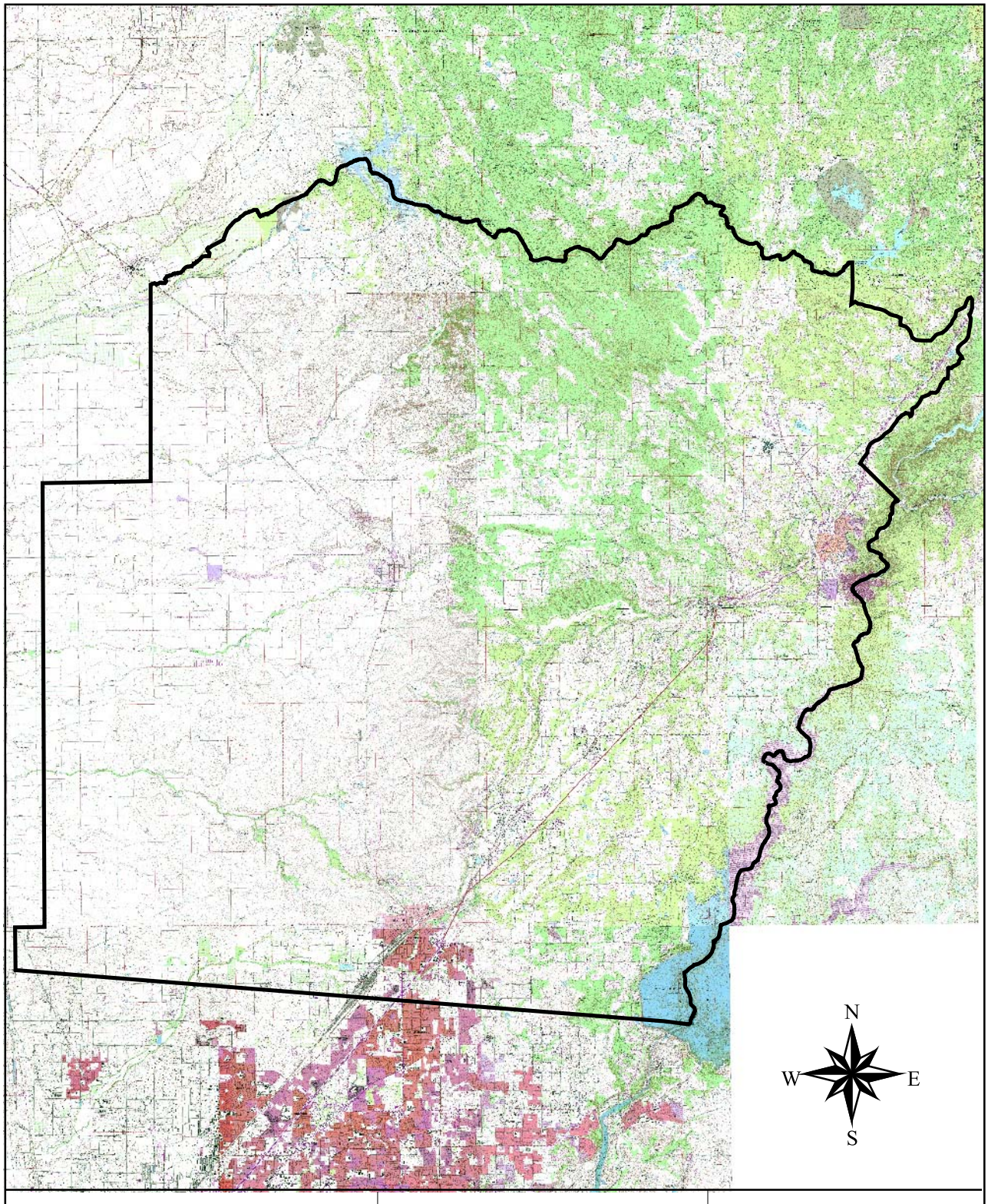

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Figure 1

Study Area with USGS Basemap

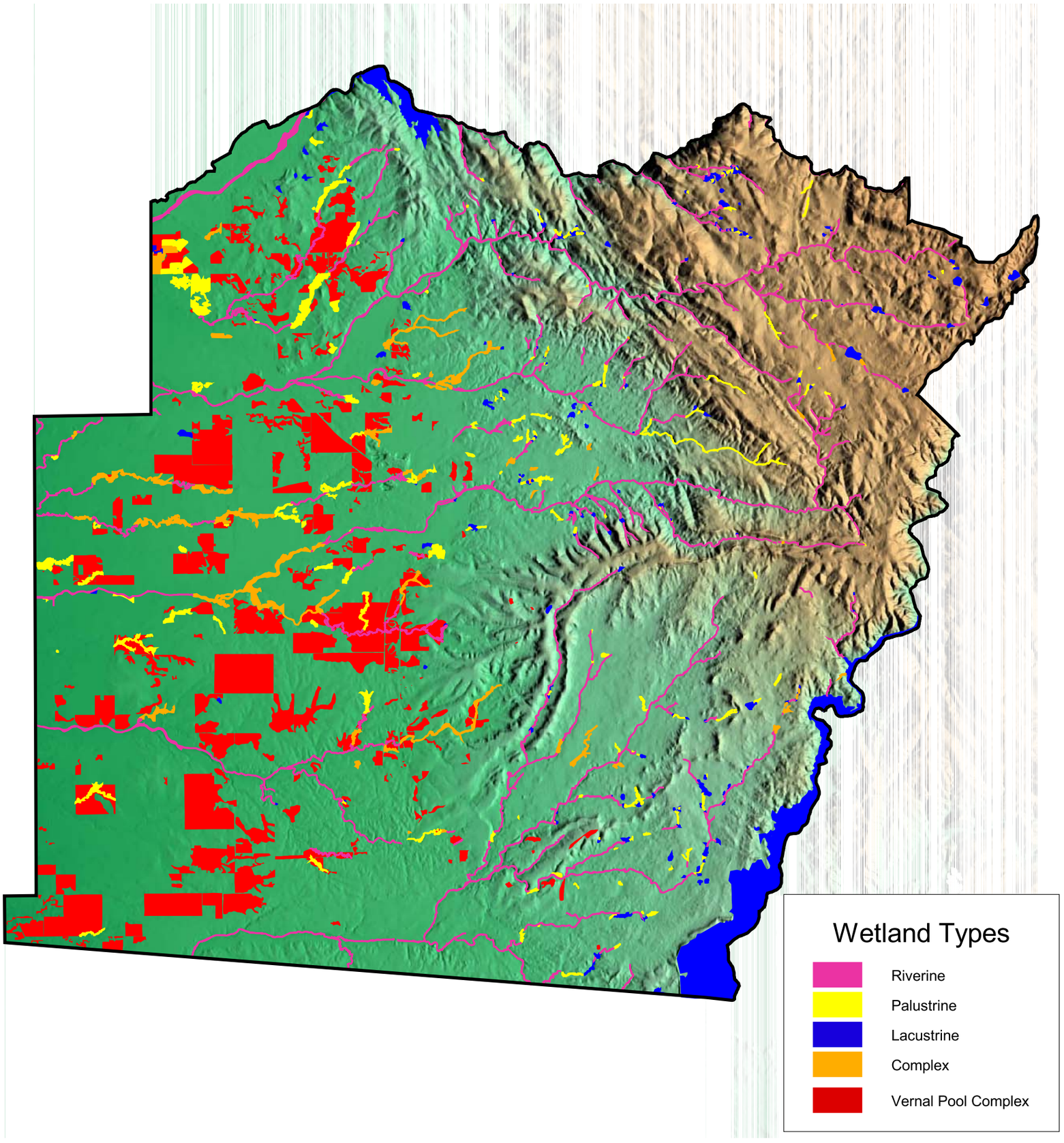

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Figure 4

Recognized Aquatic and Wetland Resources in Western Placer County with DEM Basemap

with steeper slopes and higher peaks and valleys. The primary effect of topography is the production of higher rainfall amounts and, therefore, greater and stronger runoff.

Rainfall

The rainy season in the western county occurs between November and May, and the majority falls between December and March. Rainfall amounts are largely the result of topography and increase rapidly from the valley floor to the higher foothills. Average precipitation at Roseville is 18 inches and at Lincoln it is 20 inches. Rocklin receives over 20 inches and Auburn gets over 35 inches.

Geology and Soils

The area immediately around Auburn consists of Jurassic and Triassic metavolcanic rocks. The remainder of the upper foothills is composed of Mesozoic granitic rocks. Pliocene nonmarine sediments occur between the granitic rocks to the east and Highway 65 between Roseville and Lincoln. These sediments form the Mehrten Formation, which consists of a variety of cemented material, and is well known for supporting some of the best vernal pools along the east side of the Central Valley. Eocene deposits of he Ione Formation form small pockets associated with the Mehrten. West of highway 65, is a large extent of Pliocene and Pleistocene nonmarine sediments. These tend to form coarse, well drained soils. Further to the west, more recent alluvial fan deposits form coarse to fine grained soils.

Soils in the upper and lower foothills of western Placer County include Auburn, Sobrante, Andregg, Caperton, Sierra, Exchequer, and Inks. The upper foothill soils are shallow to moderately deep and are typically well drained. As a result, much of the rainfall in this region finds its way into streams either through direct runoff or groundwater discharges. The Exchequer-Inks soils occur over shallow volcanic rock. Inks soils are formed from consolidated or cemented sediments derived from volcanic rock. This is one of the primary Mehrten Formation soils.

Valley soils include San Joaquin, Cometa, Fiddyment, Kasberg, Ramona, Kilga, Redding, and Corning Series. Several of these are Alfisols and have dense, subsurface clay layers that impede water percolation. Wetlands are often found on these soils because they tend to hold water, especially in depressions.

Land Use

Western Placer County has a variety of land uses including urban centers and agriculture. Most of the county is in private hands. Roseville, Rocklin, and Lincoln are rapidly growing urban communities in the southern part of the county. Loomis, Penryn, and Auburn still retain some of the rural atmosphere that once was more common in the area. Outside the city limits of these communities, residential lots are larger and the population density is lower.

The far western part of the county is devoted to crop production. Rice is a common crop on the heavy clay soils of the northwest. The thinner soils of the valley and lower foothills are used for livestock grazing. Orchards are still relatively common from Newcastle north and east to Auburn. This part of the county also has a few vineyards, and small strawberry patches are common on open ground throughout the foothills.

METHODS

Available GIS Data

The Placer Legacy program has developed a number of GIS data layers for various parts of the county. These are available for viewing at www.placer.ca.gov/planning/legacy/legacy-maps.htm. These data sets can be made available in GIS format to approved users.

Mapping Criteria

As mapping progressed, it became clear that guidelines were needed to help determine what was to be mapped. Western Placer County supports a large and extensive system of wetland caused by leaking water delivery canals, irrigation runoff, irrigated pastures, and others. For the most part, the wetland types were excluded from this analysis.

Natural and manmade habitats: Rivers and streams in western Placer County are natural features, although many have been substantially affected by man's activities. Because so few wetlands in western Placer County are natural, decisions had to be made about what to include. Wetlands associated with impoundments were usually mapped, especially if they were large and connected to other habitats. Very small or isolated wetlands and open water habitats were usually not mapped. These usually occur on small parcels (one to five acres, or so) and are not amenable to long-term conservation by public agencies. For the most part, wet areas created by leaky canals and pipelines, or from irrigation runoff, were not mapped, although some might be within the Corps' 404 regulatory authority.

Habitat value: Habitat value played a large part in determining what was mapped. Areas that that had species, habitat, or structural diversity were typically mapped, even though they were the result of human activities. Markham Ravine in Lincoln and portions of lower Auburn Ravine are good examples. These area support several habitat types and provide structural diversity that would not otherwise exist in the region. Mapped areas that support wetlands, open water, and riparian vegetation were particularly highly rated. We also looked at wetlands and open water habitats to see whether they were contiguous with other similar habitats. Small isolated ponds, for example, were often not mapped. Ponds in or near streams usually were. Some county streams have stretches with natural channels and good habitat and stretches where the channel has been realigned and channelized. In these cases, the good stretches were mapped and the channelized stretches may not have been (we were not always consistent with this guideline).

Mixed categories: Areas of high habitat value are often also areas with more than one category of wetlands and open water. Persons using the data set should realize that polygons mapped as riverine or lacustrine usually also include palustrine habitats on the edges of those systems. Ponds, for example, usually have a substantial fringe of freshwater marsh, a palustrine system. Where the area mapped was large and complex it was mapped as a miscellaneous category. The best of these mixed habitats includes a riparian canopy of trees and shrubs.

Temporal changes: The extent of the various systems changes annually in some mapped polygons. For example, a pond might appear as open water (lacustrine) in February and as cattail marsh (palustrine) in September. Likewise, some streams may be mostly open water, flowing water (riverine) during the winter but have a large wetland fringe (palustrine) during

the summer and fall. These annual shifts provide a variety of wildlife habitats throughout the year.

A second temporal change affects how the maps are viewed. Wetlands obvious at one season may not be so obvious in another, and this can affect what the view sees. Wetlands mapped on summer aerials may not be readily identified on winter aerials. Also, some wetlands obvious in late spring or early summer may not be apparent on fall aerials.

Perennial, intermittent, and ephemeral systems: Perennial streams were always mapped. Intermittent streams were usually mapped, except where they have been converted to ditches for considerable distances. This conversion is most apparent in the valley portion of the county west of Highway 65. Ephemeral streams were rarely mapped. These are areas that may be within the Section 404 authority of the Corps of Engineers, but are too narrow and too extensive to map.

Scale and edge matching: Some of the aerial sets had very high resolution, allowing us to use very large scales while looking for mappable features. Many natural wetlands, mostly seeps and springs, are small or obscured by tree and shrub cover. For the most part these were not mapped. On the other hand, marshes and wetland complexes created in part by man tend to be large and in open areas, and these were readily mapped. Consequently, most of the mapped wetland features are areas affected by human activities.

The various aerials used for this study did not match perfectly. As a result, the viewer may see some map polygons offset slightly from what the aerial shows. This probably occurred because the polygon was mapped on another aerial that was not matched exactly. Other data sets show similar offsets, again, probably the result of poorly matched aerials.

USGS maps: We attempted to map all features shown as blueline streams or bodies of open water shown on USGS quadrangle maps. In some cases, particularly rapidly growing areas such as Rocklin and Roseville, what is shown on the maps and what is evident on recent aerial photographs were vastly different.

Regulatory issues: The Corps of Engineers regulates activities in "waters of the United States" as prescribed by the federal Clean Water Act. The definition of waters of the United States includes wetlands, which also are sometimes described as special aquatic sites.

Except for isolated wetlands, the Corps would probably regulate all mapped areas. The Regional Water Quality Control Board regulates all Corps areas under Section 401 of the Clean Water Act. It now regulates isolated wetlands under the state Porter-Cologne Water Quality Act. The Department of Fish and Game regulates perennial and intermittent streams, and some ponds, but may not claim jurisdiction over ephemeral drainages with no riparian cover.

This map is not intended to show all potentially regulated areas. Few if any ephemeral drainages have been mapped. Many of the unmapped stock ponds may also be regulated by one or more of the agencies. Ditches, and wetlands emanating from leaky canals and pipelines may also be regulated, but these were rarely mapped.

Aerial Mapping

A series of aerial photographs were used for this project. Dates ranged from March 1999 to January 2003. These also covered a period of months. Summer photographs were particularly useful in some areas because wetland areas are usually obvious during the dry parts of the year.

The final map was prepared on the fall 2003 series of photographs in order to match this data set with existing data (see Appendix A)

Field Documentation

Field identification of the mapped features took place throughout the study period, with the emphasis occurring after the draft map was complete. Aerial reconnaissance was conducted on one occasion to cover as much ground as possible as well as view landscapes not available to see from the ground.

Map Metadata

All map data is in California State Plane, Zone 3, NAD 27.

PLACER COUNTY WATER MANAGEMENT

The first water distribution system in the county was developed in the early 1850s to provide water for mining operations. By the 1890s, agriculture began to replace mining as the dominant economic force in the county, and the canal system began to supply more water to orchards, farms, and ranches in western Placer County. A substantial orchard and fruit packing industry arose in the foothills between Folsom and Lincoln in the early part of the 20th century. Remnants of this industry are still evident, but it is nowhere near as extensive as it was between 1935 and 1950.

Three agencies store or distribute water in Placer County: Placer County Water Agency, Nevada Irrigation District, and Pacific Gas & Electric.

Placer County Water Agency has 165 miles of canals in the County, and the majority of these are in the western Placer County study area. The Nevada Irrigation District has 425 miles of canals and 300 miles of pipelines in four counties. These agencies supply water for various uses, but does not always know how the water is used. Once it is delivered, the buyer may use it for irrigation, stock ponds, or other uses. Pacific Gas & Electric accumulates and stores water, but much of its water is purchased by the other water agencies for dispersal.

Most of the lacustrine habitats in western Placer County are the result of water deliveries to stock ponds. In addition, many of the wetlands occur because of leaky canals and pipelines, and from agricultural runoff.

WESTERN PLACER COUNTY WETLANDS AND OPEN WATER HABITATS

The map and GIS files included with this report show the locations of substantial riverine, lacustrine, and palustrine systems in western Placer County. Most of the riverine features are natural features, whereas most of the lacustrine features are the result of mans activities. Palustrine features in the western County are a mix of man-induced and natural wetlands.

The Corps of Engineers often refers to areas that have flowing or standing water and lack vegetation as “other waters,” and these are mapped as riverine and lacustrine respectively. Wetlands, on the other hand, are waters of the United States that are vegetated, and these are mapped as palustrine. Figure 5 and Figure 6 show various wetland types that have been mapped.

Typical vernal pool complex adjacent to cultivation.

Irrigation-influenced palustrine area in foothills.

Riverine corridor (Coon Creek)

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Photos taken July 4, 2003

Figure 5

Typical Wetland Types
in Western Placer County

Riverine Systems

Riverine systems are linear open water habitats characterized by the presence of flowing water. Examples are rivers, streams, creeks, and other drainages. Streams may be further classified by the duration of running water. Perennial streams have flowing water all year. The American River and the Bear River are natural perennial streams. Intermittent streams flow during and for some time after the rainy season, but they are usually dry before the beginning of the next rainy season. Intermittent streams often have a large groundwater component. Many western Placer County streams were intermittent, and a few may have been naturally perennial. Ephemeral streams flow only and shortly after periods of rainfall, and they do not have a strong groundwater component. Cowardin et al. did not discuss ephemeral streams, but many of these are regulated by the Corps of Engineers.

The American River on the southern county line and the Bear River on the northern county line are the primary riverine systems in the western part of the county. Both rivers have been dammed at lower elevations and reservoirs have formed behind the dams. A portion of Folsom Lake on the American River forms the southeast corner of the county. To the north, Camp Far West Reservoir along the Bear River is partially in Placer County. Coon Creek, Auburn Ravine, Secret Ravine, and Miners Ravine are other significant watersheds in the county. These stream systems have their origins at middle elevations. Numerous creeks arise in the lower foothills just east of highway 65.

The primary watersheds of the county are now and probably were historically perennial streams. That is, they had flowing water for the entire year. Snowmelt, seeps, springs, and other discharged groundwater permitted at least some year round flow. Creeks forming in the lower foothills (roughly highway 65 west) probably lacked sufficient groundwater discharges to create year round flow. These streams were more likely ephemeral (flowing only during and shortly after rainfall) or intermittent (flowing for portions of the year and dry for the remainder). Irrigation, urban runoff, and other sources of water have converted many of these intermittent and ephemeral streams to perennial or nearly perennial status. In addition, some streams are used by various water agencies as conveyance facilities that may carry high flows for short periods.

Lacustrine Systems

Lacustrine systems are open water habitats characterized by the presence of standing water deep enough to prevent the growth of rooted vegetation. Lakes and ponds are examples. As near as we can tell, western Placer County has no natural lacustrine systems. However, the diversion and impoundment of water over the years has created numerous lacustrine areas. Folsom Lake and Camp Far West Reservoir are large, manmade lacustrine habitats. The many stock ponds in the western County are also lacustrine systems.

Western Placer County now has a large number of ponds. Many were created as a water source for livestock, but rural homeowners also have created a many smaller ponds. Individually, these are probably an insignificant resource. Cumulatively, however, they provide a substantial amount of open water and associated wetland habitat that otherwise would not occur in the county. Not all ponds have been mapped as discussed in the Mapping Criteria section.

Palustrine Systems

Palustrine systems are wetlands. Wetlands are areas that are inundated or saturated long enough to meet the technical definition of wetlands in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Wetlands are also vegetated. Aerial cover by vegetation is usually 50 percent or more, often 100 percent. Wetland categorization is an inexact science at best. Wetlands can be defined broadly (that is, freshwater wetlands and salt water wetlands) or narrowly (as might be done for ecological studies of relatively small areas). Wetlands in western Placer County include marshes and various types of seasonal wetlands.

Like riverine systems, palustrine systems can be further characterized by the duration of inundation. Marshes, meadows, bogs, and fens tend to be inundated or saturated for most or all of the year. Meadows, bogs, and fens usually occur at higher elevations and are rare or absent in western Placer County. Marshes usually have standing water with emergent cattails and bulrushes, and are particularly common at the edges of stock ponds and in areas where water flow in creeks and streams has been impeded. Vernal pools are inundated only during the winter and spring.

Seeps, springs, and other groundwater discharge points create wetlands that may not be saturated for the entire year. These are typically referred to as seasonal wetlands. Vernal pools are a special type of seasonal wetland that is inundated during the winter and spring and dry during the summer and fall. Vernal pools were not mapped for this study.

Fringe wetlands, those forming along streams and ponds, are another wetland type that varies in duration depending on the amount of water supplied by the stream or the period of inundation in the pond. At small scales on aerial photographs, fringe wetlands are difficult to separate from the stream or pond.

Complexes

Some areas of wetland and open water defy easy categorization. For example, Markham Ravine on the north side of the city of Lincoln has been dammed, in part by beavers. The result is a significant wetland complex of open water, freshwater marsh, seasonal fringe wetland, and riparian habitat. The amounts of each type vary through the year as the amount of open water is reduced and freshwater marsh expands. Although these complexes are in part or wholly caused by human activities, they nevertheless provide significant habitat variables for wildlife.

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north fork associates

3500 0 3500 7000 Feet

LEGEND

- Riverine
- Palustrine
- Lacustrine
- Complex
- Vernal Pool Complex

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Aerial photos taken Fall 2002
by AirPhoto USA

Important Wetlands and Waters of the U.S. in Western Placer County

December 2003