HANKINS

Seasonal Wetland Baseline Report
For The
Santa Rosa Plain, Sonoma County

Natural seasonal wetland swale and vernal pool on the Santa Rosa Plain, spring, 1989.
Middle supports *Eleocharis, Juncus, Pleuropogon*; edges include *Blennosperma bakeri, Orthocarpus faucibarbatus, Trifolium variegatum, Limnanthes douglasii* var. *nivea*

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SEASONAL WETLAND BASELINE STUDY REPORT FOR THE SANTA ROSA PLAIN

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A Rainfall data for Santa Rosa
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C Plant species checklist for the Santa Rosa Plain
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1 Summary chart of sites surveyed and known rare plant locations
2 500-scale air photo maps
3 1000-scale summary map

Preface

This report is the product of many years of botanical and wetland investigations conducted on the Santa Rosa Plain by Charles Patterson, Betty Guggolz, and Marco Waaland, plus other independent information prepared by Nancy Harrison, Allan Buckmann, and others. This study was primarily a compilation of existing information, and the report is intended as a summary of and supplement to the basic site data provided in Attachments 1 and 2. This effort was funded in part by a Section 6 Grant-In-Aid from the U.S. Fish and Wildlife Service, administered by the California Department of Fish and Game, Yountville regional office.

Plate 1. Typical vernal pool (foreground) and swale on the Santa Rosa Plain. The pool vegetation is dominated by *Eleocharis, Pleuropogon,* and *Eryngium*, while the swale (center background) is dominated by *Blennosperma bakeri* (yellow).

SEASONAL WETLAND BASELINE REPORT FOR THE SANTA ROSA PLAIN

1.0 INTRODUCTION

1.1 Background, Issues, and Objectives

The natural wetlands of the Santa Rosa Plain (Plain) in Sonoma County (see Figure 1) have been severely depleted and/or degraded over many decades of agricultural and residential land use. Continued use of this valley landscape for livestock grazing, orchards and vineyards, hayfield, rural and urban development, wastewater disposal, and other human activities has resulted in a significant decline in most wetland resources, including both acreage of habitat and several species found almost exclusively in these habitats. With increasing economic pressure to utilize the land in this region, wetland resources, from seasonal pools to riparian forest, continue to be threatened with loss of habitat and specific population declines. There are still remnant pockets of such resources, however, scattered across both the urban and rural landscapes, as well as a number of larger agricultural lands with minimally altered terrain. Within the Plain's mosaic of land uses are scattered locations of several sensitive species, many degraded wetlands, and numerous historic (now extirpated) rare plant sites. There is also significant potential for restoration.

Legal changes have recently been implemented at several levels to prevent continued direct losses of wetland habitats and arrest the decline of sensitive species due to continued incremental, direct, and indirect impacts. In late 1991, the Nationwide Permit (NWP) program of the U.S. Army Corps of Engineers (Corps) was reauthorized with modified conditions that affect the wetlands of the study area, and the U.S. Fish and Wildlife Service (Service) officially listed three regionally endemic plants as Endangered. These legal actions have resulted in greater scrutiny in granting permits for certain types of development, and public awareness regarding wetlands has risen. Wetlands in this region are largely seasonal and often not obvious, but are subject to the jurisdiction of and regulation by the Corps. Federally Endangered species such as the three of primary concern for the Plain are subject to regulation by the Service under the federal Endangered Species Act.

The primary issues that have led to this study are (1) the scattered presence of remnant jurisdictional wetlands (including vernal pools) in and around the existing Santa Rosa urban area, (2) the 1991 federal listing as Endangered of three regionally endemic vernal pool wildflowers, (3) the severe general and specific declines in both natural wetland habitats and their associated flora and fauna, and (4) the difficulties faced by continued urban development juxtaposed over such wetlands and sensitive features. This report has been prepared in an effort to compile and condense the information that has already been generated over many years of individual botanical and related wetland investigations.

Potential conflicts between land use and wetland resource conservation resulted in the formation in 1991 of the Sonoma County Vernal Pool Task Force (VPTF), convened by then-Congressman Frank Riggs to help find solutions to this situation. Participants include representatives from federal, state, and local agencies as well as private special interest organizations, including:

Federal: U. S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service, Soil Conservation Service (SCS), and representatives from Congresswoman Lynn Woolsey's office;

State: California Department of Fish and Game (Department);

Local: City of Santa Rosa and County of Sonoma planning staff, Sonoma County Agricultural Preservation and Open Space District (SCAPOSD), Santa Rosa Subregional Water Reclamation and Reuse System (Subregional System), Sonoma County Water Agency (SCWA);

Special interests: California Native Plant Society (CNPS), Sierra Club, Building Industry Association, local developers, Farm Bureau, wetland biologists.

A Memorandum Of Understanding (MOU) has been signed in which the major agencies and local governmental entities have agreed to work together to facilitate both wetland conservation and development permitting. Congressional funding, obtained by Congresswoman Woolsey's office and administered by the Corps, is being used to conduct a detailed analysis of the region's wetlands and to prepare a plan to conserve wetland resources and streamline the permit process for development.

As the VPTF began to study the issues and plan an approach to solving the resource-vs-development conflict (i.e., completion of a comprehensive regional wetland conservation plan), an opportunity arose to prepare an updated baseline inventory of the resources present. A "Section 6 Grant-In-Aid" from the Service has been used to help fund such a baseline study, which has been administered by the Department. This report (a product of that effort) is a summary of information previously collected by various botanical investigators in the region, and supplements a set of maps and a summary chart which contain site specific data for land in the region that has been surveyed.

The main goal of this study was to compile the preexisting information regarding wetlands and rare plant resources in the study area into an up-to-date summary. The report and data maps will be used in the preparation of a separate regional wetland conservation plan: the Santa Rosa Plain Vernal Pool Preservation Plan. The baseline study includes this summary report, a summary chart (Attachment 1) that catalogs the sites that have been surveyed to date, a set of detailed air photo maps (Attachment 2) at a scale of one inch equals 500 feet that cover the entire study area, and a less detailed map (Attachment 3; one inch equals 1000 feet) that summarizes the distribution of wetland resources and primary soil types.

The more detailed mapping (one inch equals 500 feet) is presented on original blueline air photos and includes site boundaries of the properties that have been surveyed, the extent of wetlands (either presumed or confirmed where known), the known locations of sensitive species, and indications of the sites that are under public (conservation) ownership or easement. The less detailed (one inch equals 1000 feet) map shows generalized soil boundaries (basic soil series), known and suspected wetlands, known and historic sensitive species locations. The summary chart includes most of the basic information already collected for this region and also provides a general framework for additional data collection, although not all data categories have been completed. The information in the chart ranges from fundamental parcel data (e.g., size, geographic location, photo number, Assessor's Parcel Number, owner, place name) and land use, to rare plant information, estimated wetland acreage, and level (and dates) of surveys completed.

1.2 Study Area

The study area is roughly 50,000 acres (see Figures 2 and 3) and consists of the broad valley between Windsor in the north, Cotati to the south, the Laguna de Santa Rosa (Laguna) to the west, and State Highway 101 along the east. This landform is called the Santa Rosa Plain or Cotati Valley and is comprised of several very low gradient watersheds that drain westward to the Laguna. The City of Santa Rosa dominates the east-central part of the study area, while agricultural lands comprise the western half. Smaller urban areas occur in the extreme south (Cotati and Rohnert Park) and north (Windsor). Sebastopol is to the west and just outside the study area. This study area encompasses the 28,000 acres of Santa Rosa Plain studied by Waaland et al. (1990), and includes a larger peripheral zone around the valley floor proper, plus the urban areas.

There are three general types of land use in which the region's wetlands occur, including (1) the scattered vacant lots and small habitat islands within the existing urban and semi-urban environment, (2) the urban fringe where larger areas of undeveloped land meet active land development, and (3) the larger tracts of agricultural land in the western and southern parts. Agricultural lands range from level (graded) and/or irrigated cropland, to naturally undulating pastures (annual grassland) and oak savanna. Figure 3 shows the subregions used in the summary chart that accompanies this report.

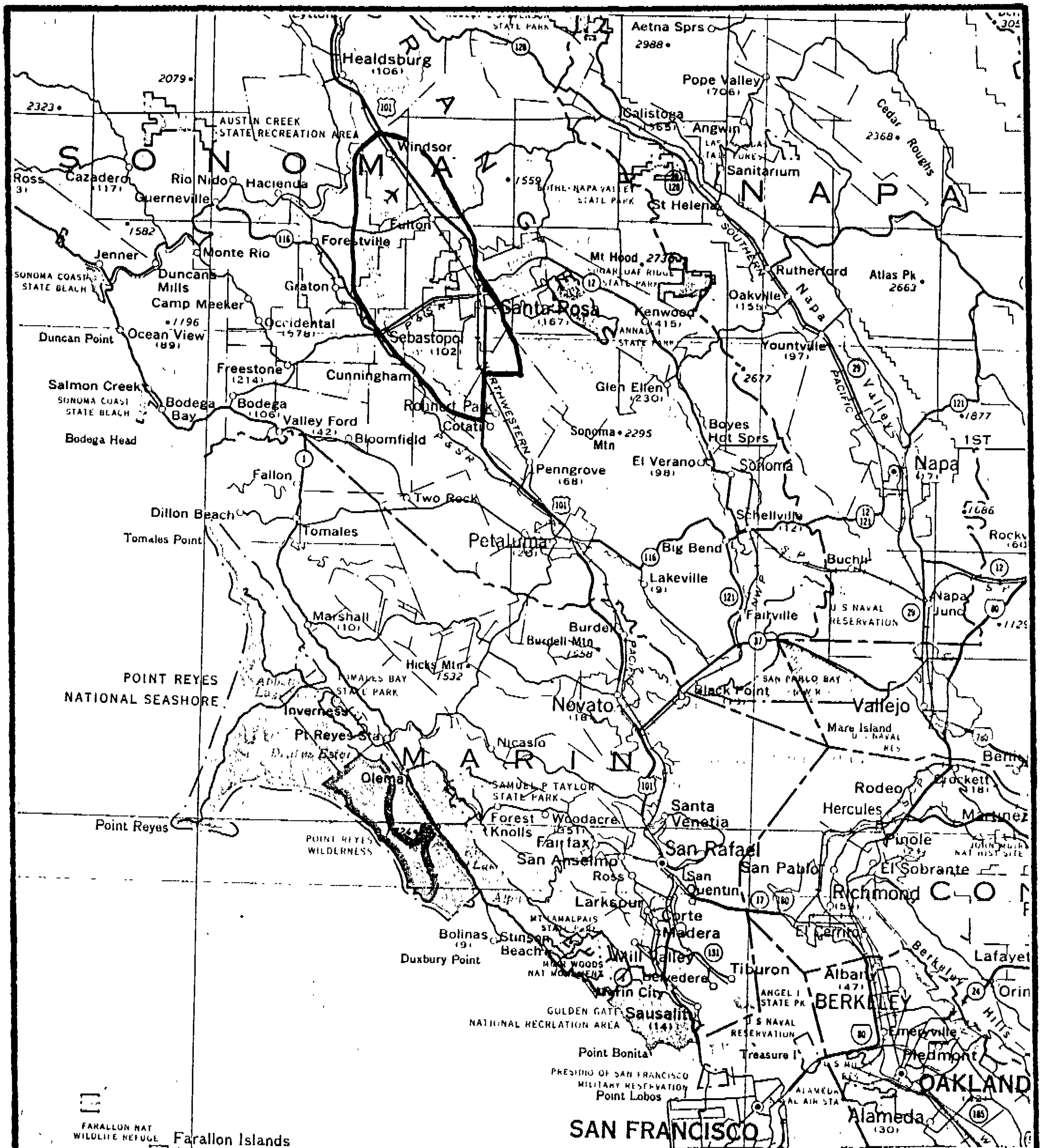


FIGURE 1

Study Area Regional Location

NORTH

SCALE: 1:500,000
1 inch = 8 miles

Sonoma County
(Basemap:
USGS Northern
California)

Prepared by: C. Patterson, 6/30/94

SANTA ROSA PLAIN WETLAND BASELINE STUDY

1.3 Historical Perspective

Prior to human settlement, the Santa Rosa Plain contained substantially more seasonal wetland than is present today. Following the birth of the major cities, Petaluma and Santa Rosa, and the advent of the railroad in 1870, the valley region, which was already agricultural, was developed further (tilled, seeded, cross-fenced, ditched and drained) with a variety of income-producing crops and ranching activities. Many of these activities (e.g., poultry, orchards) expanded and reached their peak of production, then declined to be replaced by other crops (vineyard) or uses. Other farming activities, such as the dairy industry have remained more stable.

During the early years, agricultural activities included ground crops, hopfields, orchards, poultry, pastures and hay. From 1939 to 1960, hopfields and prune orchards dotted the Santa Rosa Plain. Hop production declined during the 1960s leaving only a few historic hopkilns as mute testimony to a once thriving industry. Much of the land formerly in hops is now urban and rural residential. In the 1930s, 3000 acres of flatlands between Santa Rosa and the Rohnert Park area were developed into the Waldo Rohnert Park Seed Farm, an extensive vegetable seed producing operation that shipped vegetable seeds throughout the world. The seed farm flourished for several years, then gradually gave way to houses. In the 1950s, plans for the City of Rohnert Park began to take shape. Constructed on lands formerly occupied by the seed farm, Rohnert Park was incorporated in 1963. During the early part of this century, the dairy industry continued to thrive, and with increased irrigation in 1977 provided by the Subregional System, has remained a productive industry. (LaBaron and Mitchell, 1993)

The end of World War II brought new population growth, and with it came the need for houses and commercial centers, resulting in the birth of some cities and the expansion of others. In 1949, the population of Santa Rosa was approximately 15,000. Forty-five years later, it has multiplied eightfold, resulting in the annexation of rural residential, agricultural and open space lands into the urban boundaries. The loss of seasonal wetlands and their dependent plant and animal species occurred concomitantly with these events, and much occurred long before any official recognition of wetlands and/or their values was established.

Each type of historic land use has had some impact on the region's seasonal wetlands. Ground crop and orchard cultivation has eliminated native vegetation from large areas, while long-term grazing has shifted the native grasslands to non-native annuals and forage species. There has been a decline in both native grassland cover and the individual native species. Soil disturbances, ditching and draining, grazing, and other uses have changed the growing conditions, favoring non-native grass, weed, and forage species that have replaced the natives. Most recently, large-scale irrigation has affected large areas of rural land, and residential growth has led to filling of wetlands on undeveloped land around the study area's municipalities. (Waaland and Vilms, 1988; Patterson, 1990)

In Santa Rosa, continued urban expansion is planned (City of Santa Rosa, 1993), including the possible annexation of 1,400 acres in the southwest area (860 of which are proposed for urban development), and smaller areas to the northwest and southeast. Urban development also is expected to continue in Windsor, Rohnert Park, and Cotati.

Vernal pools have diminished by 90 percent in the Central Valley (Holland, 1978), and are rapidly disappearing in San Diego County (Bauder, 1986). The Santa Rosa Plain has undergone a similar land use history, and vernal pool resources are subject to ongoing habitat loss (Waaland et al., 1989; Patterson, 1990). Prior to settlement and agricultural development, the Plain contained an estimated 20,200 acres of pristine oak woodland, savanna, and grassland, which in turn contained the natural distribution of vernal pool and swale habitats. Only about 38 percent of this natural wetland-containing habitat mosaic remains in the study area, and most of this has been heavily influenced by agriculture. The remaining minimally altered habitat includes 1300 acres of unirrigated oak savanna and 6500 acres of grassland, for a total of approximately 7,800 acres of potential wetland-containing habitat (Waaland et al., 1990). Since much of this remaining grassland has been historically cleared for orchards or leveled for other reasons (and has reverted to grassland without the previous vernal pool topography), 38 percent may be a high estimate.

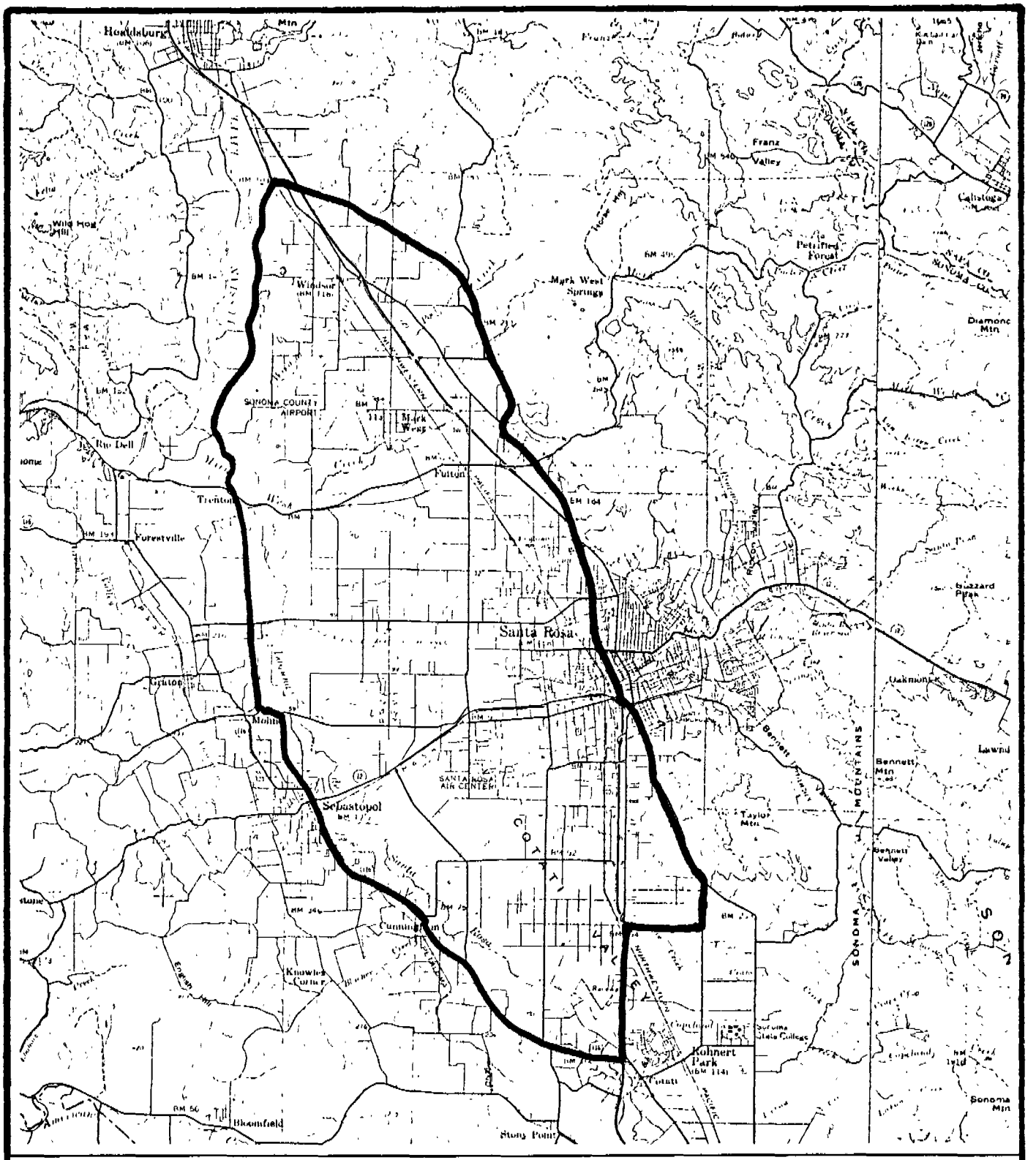


FIGURE 2
Study Area Setting

NORTH ↑		Sonoma County (Basemap: USGS Bay Area set, sheets 1 & 2)
	Prepared by: C. Patterson, 6/30/94	

SANTA ROSA PLAIN WETLAND BASELINE STUDY

Based on an average proportion of approximately 25 percent actual wetland to overall landscape for this region (Waaland et al., 1990), the study area's remaining 7,800 acres of potential wetland-containing habitat would contain roughly 1,700 acres of actual vernal pools and other wetlands. However, given the land uses on these lands, the amount of remaining wetland is probably even less. Assuming that the Plain contained a similar percentage of wetlands (25 percent) before development, the study area historically could have supported a total of roughly 7000 acres of actual wetland. With the overall loss of wetland-containing habitats (savanna and grassland) and continuing use of the remaining lands, the actual wetland extent probably has been reduced to less than 1000 acres, translating into a loss of some 85 percent for the region (Waaland et al., 1990). Further, since the natural habitat breakdown for this region's wetlands includes both pools (ponded) and swales (non-ponded) in roughly equal proportions, and the swales have been thoroughly invaded by exotic vegetation, the amount of vernal pool habitat per se is likely to be less than a few hundred acres. Even these remaining vernal pool habitats have been affected by exotic species invasion and, at a minimum, intermittent livestock grazing.

1.4 Regulatory Framework

There are two primary resource issues involved in the study area that have been translated into major land use planning considerations and permitting regulations over the last 10 years. These are wetlands and endangered species. The federal Clean Water Act (CWA) of 1972 and its amendments have established that wetlands (in addition to the "navigable waters" originally protected under the CWA), have intrinsic natural and economic values and warrant conservation. Through the CWA, wetlands and other "waters of the United States" have been officially recognized as significant resources and now present legal constraints on land use. The U.S. Army Corps of Engineers has the responsibility for regulating the discharge of fill (and other potentially disruptive activities) in wetlands, with the EPA providing oversight.

The second major natural resource issue involved on the Plain involves sensitive species as designated and protected under the federal Endangered Species Act (FESA) and the state's California Endangered Species Act (CESA). When federally-listed or proposed species are involved, the Service may participate in project review in conjunction with the Corps. The Department also has policies and regulations that protect wetlands and endangered species at the state level. Under the California Environmental Quality Act (CEQA), wetlands and sensitive species are regarded as significant resources worthy of planning consideration and requiring mitigation.

On the Santa Rosa Plain, there are three plant species that are listed and legally protected at both the state and federal levels. These grow in or around vernal pools and other seasonal wetlands and pose potential constraints on land use. For any activity that proposes to fill wetlands that support such species, the Corps generally initiates formal consultation with the Service. While "critical habitat" has not been officially designated for these species, the potential occurrence of any of these taxa in wetlands of the study area dictates a new level of concern. Similar policies and general protections are afforded these species at the state level through CESA and CEQA.

1.5 Methods

This study focused on the compilation of existing resource data for numerous properties on the Santa Rosa Plain, specifically regarding information on the presence and extent of jurisdictional wetlands and/or sensitive species. Detailed field work was not conducted as part of this study.

The first task was the creation of the summary chart format, identifying the categories of information available and/or appropriate for the baseline study. These included categories for which no information was available since adequate surveys have not been conducted. For example, few sites have been surveyed for aquatic invertebrates, amphibians, or other wildlife. Until recently, such rare or depleted species as the California tiger salamander and California linderiella (an endemic fairy shrimp) were not officially recognized as sensitive, nor were surveys for them

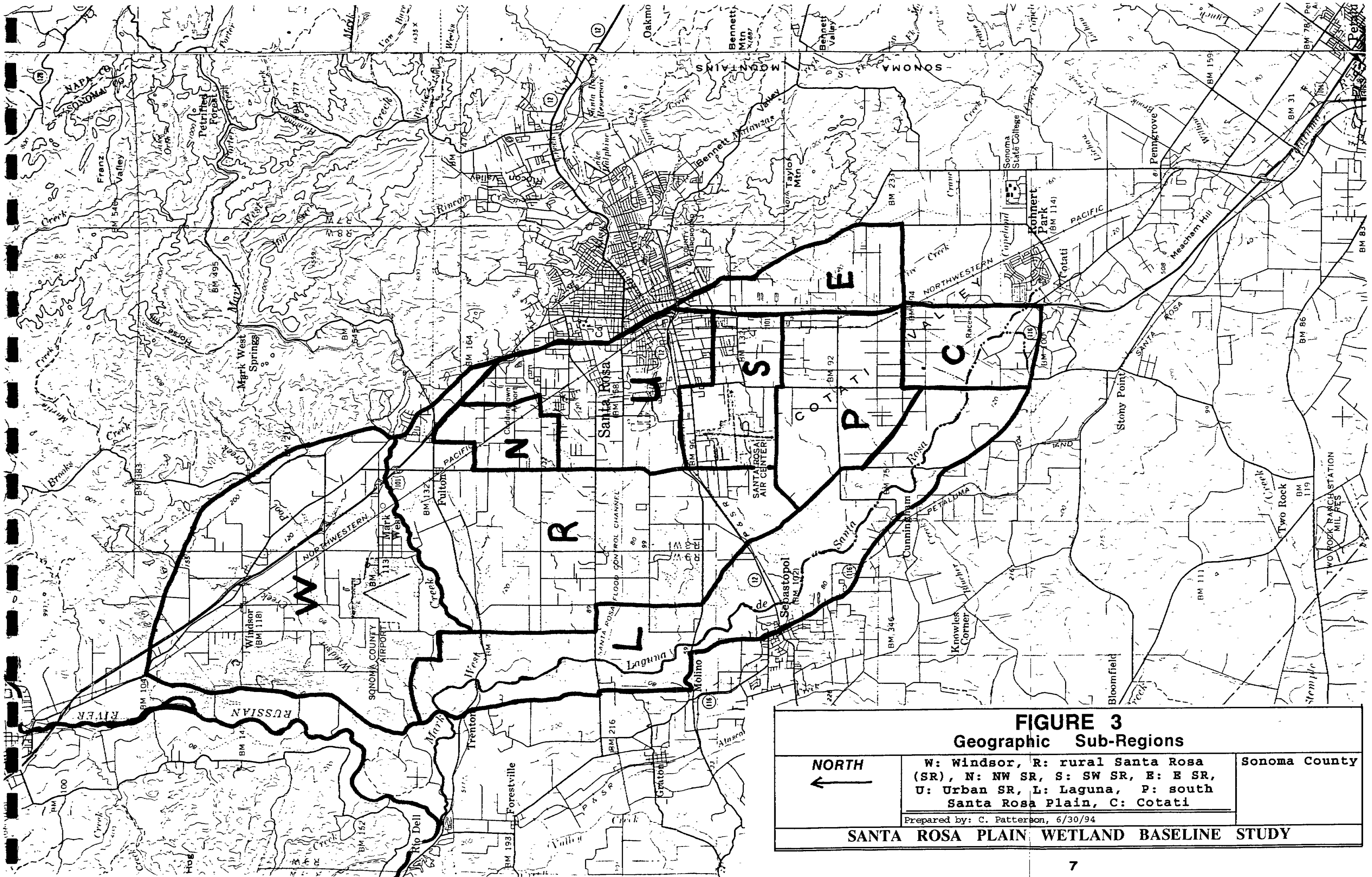


FIGURE 3
Geographic Sub-Regions

NORTH ←	W: Windsor, R: rural Santa Rosa (SR), N: NW SR, S: SW SR, E: E SR, U: Urban SR, L: Laguna, P: south Santa Rosa Plain, C: Cotati Prepared by: C. Patterson, 6/30/94	Sonoma County

SANTA ROSA PLAIN WETLAND BASELINE STUDY

required. Most surveys done prior to roughly 1989/90 were botanically focused, although many of the most recent detailed surveys have included searches for such animals. Early data are often anecdotal, and no consistent methods were employed between investigators.

The summary chart format was reviewed and revised, resulting in a 38 column table (Attachment 1) used to characterize each site. Many blank columns were included for future data entry. The initial data compilation and mapping was completed independently by the three investigators from project files and regional resources, and was then integrated into the master chart. Accompanying the chart is the set of air photo maps (Attachment 2) which shows (at a scale of one inch equals 500 feet) the parcels surveyed (with map code numbers) and the primary wetland resources present (or historically reported), i.e., jurisdictional wetlands and locations of the three federally listed plants.

Plant taxonomy in this report follows Munz (1959) and Munz and Keck (1968) unless otherwise noted. Tables 2 and 3, and other references to rare plants, however, use names found in the new Jepson Manual (Hickman, ed., 1993).

Plate 2. Natural mosaic of oak savanna and seasonal wetlands (vernal pools and swales) on the Santa Rosa Plain.

2.0 BASELINE RESOURCES

2.1 Habitat Factors

Numerous physical and biological factors have interacted to shape the natural terrain and wetlands of the Santa Rosa Plain prior to human settlement, as well as the human-oriented landscape that has formed since that time. Current conditions reflect human settlement's impacts on the natural landscape, with only scattered remnants of pre-settlement conditions. The primary physical factors which led to the evolution of the vernal pool and oak savanna ecosystem on the Plain include the valley's underlying argillic (dense clay) horizons and high clay surface soils, the relatively flat topography, ample winter precipitation, and dry summer climate. The natural result of these physical factors is a vast network of seasonally wet swales and scattered pools within overall grassland and savanna. In the wetter habitats, there came to be an extensive niche for specialized wetland species, and a rich wetland flora has colonized and evolved in these environments. These wetlands support common and widespread plants, as well as regionally restricted (endemic) species. Built upon the natural wetland and grassland habitats were intricate communities of aquatic invertebrates, amphibians, waterbirds and waterfowl, including herbivores, predators, and grazers. Over time, complex interrelationships evolved between species and habitats, resulting in an unique valley ecosystem. Much of this natural ecosystem was eliminated from the Plain, however, before it could be studied or understood.

While soils, topography, and precipitation (combined with natural biotic evolution) dictated the pristine landscape's natural character, factors related to modern land use have fragmented the study area's wetlands and created a much-changed ecological scenario. The native flora and fauna have been greatly depleted by agricultural development, and continued farming, ranching, and other land uses (e.g., residential development) preclude recovery of the natural communities. A major factor in effect here is the large physical area involved in largely incompatible uses. Since the physical processes that fostered the native flora and fauna are still in effect, however, considerable opportunities for restoration exist.

2.1.1 Soils

The Santa Rosa Plain is situated in a broad structural trough referred to as the Cotati Valley. The creation of this valley was brought about by the uplift and tilting of large, regional-scale structures (Higgins, 1952). The low hills of the Merced formation on the west side of the valley and the volcanic Sonoma Mountains to the east have uplifted as the valley floor has sunk. The down-faulting of the Plain, which began approximately one million years ago during the Pleistocene epoch, has helped create the very low gradient of the Laguna de Santa Rosa and its tributaries.

The predominant geologic units in the Cotati Valley are the early and later Pleistocene alluviums. These older deposits occur as remnants of dissected alluvial terraces laid down by streams eroding the volcanic Sonoma Mountains to the east. These deposits underlie the gently undulating expanse of the Plain and support oak savanna, valley grassland, and seasonally wet drainage swales and vernal pools. North of Santa Rosa Creek, the underlying material is early Pleistocene alluvium (70,000-1.8 million years old) and corresponds with the Huichica loam soil series. South of this creek, the alluvium is late Pleistocene (10,000-70,000 years old) in origin and corresponds to the Wright loams. (Miller et al, 1972)

Another extensive unit in the valley includes the extremely fine-grained alluvial (clay) deposits that best reflect the regional wetlands' origins (Helley et al., 1979). These deposits correspond with the Clear Lake clay soil series. North of Highway 12, the boundaries of this deposit closely parallel the present and historic distribution of riparian forest and perennial marsh. South of Highway 12, this fine-grained alluvium was associated with historic seasonal and perennial marshlands that are now the sites of urban development in the Rohnert Park area as well as extensive agricultural development (Cardwell, 1958).

The study area contains four major soil series, all of which are characterized by high clay content either throughout the profile, such as in Clear Lake clay, or as buried layers. A few areas exhibit cemented alluvium (generally with some clay) as an underlying restrictive layer, but most of the region's buried restrictive layers are simple heavy clay. Silica-cemented alluvial layers and other types of hardpans are not common in this region. The primary soils form a wide geographic expanse of poorly and somewhat poorly drained soils. Table 1 summarizes the regional soils that are generally prone to seasonal ponding or prolonged saturation, and Figure 4 shows the extent and distribution of the generalized soil series. The following are brief descriptions of the study area's primary soil types, based on descriptions given in the Sonoma County Soil Survey (Miller et al., 1972) and unpublished field investigations made by the report authors.

Clear Lake Clay - Clear Lake clay is a Vertisol soil found on floodplains and flat basin areas, generally on the southern part of the Plain and close to the Laguna de Santa Rosa. It is a "shrink-swell" clay that is very dark and high in organic matter because the original soil genesis was under marsh conditions which contributed a large amount of dead vegetation. Its origin is relatively recent (10,000 years) having formed in closed basins in which fine sediments were deposited and marsh vegetation was added (Helley et al., 1979). The soils are typically greater than five feet deep and consist of dense clays and clay loams underlain by gravels or sandy loams.

This soil is poorly drained, permeability is very slow, and runoff potential is high. Topographic variations and lack of surface drainage routes typically result in extensive and scattered surface ponding, often from simple direct rainfall and without large watersheds (i.e., less than a few acres). Early season rains penetrate the surface horizon via an extensive network of dry season shrinkage cracks, with surface ponding occurring with relatively little cumulative precipitation as the soil wets, swells, and the cracks close. There is generally no subsurface or perched water table in this soil, and wetlands are largely dictated by simple topography and drainage patterns. Historically, riparian forests, perennial marshes and seasonal wetlands have been associated with Clear Lake clays (Waaland, 1989; Waaland et al., 1990). Much of this soil has been artificially drained and cleared of the native vegetation for cultivation of corn, grasses and hay. Large areas have also been subjected to urban development. Clear Lake clay is predominant in the Cotati, Rohnert Park, and southern Santa Rosa areas.

Wright Loam - The Wright soils are the most extensive in the study area (see Figure 4 and Attachment 3). They are derived from weathered alluvium deposited during the late Pleistocene epoch (10,000 to 70,000 years ago). These soils have undergone formative processes longer than other soils in the Laguna and have subsoils in which clay has accumulated. The soil is five or more feet deep with two feet of loam or sandy clay loam underlain by clay or a clay hardpan. The wet phase of the Wright loam is the typic phase. These soils are somewhat poorly drained, permeability is very slow in the subsoil and drainage is somewhat poor.

The native vegetation of these soils is valley oak savanna with bunchgrasses, with vernal pools and swales interspersed (Waaland, 1989a; Waaland et al., 1990). In the past, many of these soils were used for pasture or cultivated as prune orchards. At present, these soils are mainly used for dry and irrigated pasture and hay crops, as well as sites for urban development. Wright soils occur mainly between western Santa Rosa and the Laguna.

Huichica loam - These soils are similar to the Wright series in that they have a dense clay or argillic horizon that prevents significant downward percolation, and they typically have one to two feet of clay or silty clay loam on top of the restrictive layer. This soil type is predominantly located in the northern part of the study area (northwestern Santa Rosa to Windsor) and includes shallow and wet phases. The surface soil is typically very fine textured, and surface ponding occurs due to both subsurface restriction (perched water table) and topsoil "sealing".

Zamora silty clay loam - This soil is a relatively minor component in the study area and occurs in a broad band across the northern portion of the study area. The Zamora series consists of well-drained clay loams that have a clay loam subsoil formed in recent deposits on alluvial fans along the drainageways of Santa Rosa Creek and other waterways. Permeability is moderately slow in the subsoil and runoff is slow. Typical native vegetation includes grassland and oak

savanna, while vineyards, orchards, and pasture are the main agricultural uses of this soil. Other areas have been urbanized.

Because of the Plain's extensive micro-relief, numerous pockets of clay accumulation and other soil complexes are also present (C. Patterson, unpubl. field data; D. Martel, Corps of Engineers, pers. comm.). Most creeks and major drainages are lined with soils high in sand, gravel, and/or cobbles, and most swale/pool terrain exhibits denser clay soil in the lower topographic positions and more silt and loam on the higher ground.

The primary direct alterations to the study area's soils have come from discing, land leveling, and larger scale soil excavation and/or fill deposition. These activities have served to blend the topsoil layers and mix "ridgetop" soils with "swale-bottom" soils. Additional secondary effects have come from irrigation, fertilization, ditching and flood control channelization (dewatering), and localized compaction from grazing and vehicular operations.

2.1.2 Topography

The Santa Rosa Plain has a general slope of only about 0.3 percent (300-to-1) from the east to the west side. Elevations along the base of the eastern hills range from 140 feet in the south around Rohnert Park to 180 feet in the north just east of Windsor. Most of the Plain drains west-southwest to the Laguna de Santa Rosa which flows almost due north to the Russian River after originating at an elevation of approximately 100 feet in the extreme southern part of the study area in the vicinity of Cotati. In the northwest part of the study area, the Laguna is joined by Mark West Creek at an elevation of 50 feet. The Laguna drops only 45 feet over 14 miles (76,000 lineal feet) from its headwaters near Cotati to the vicinity of Mark West Creek, for a gradient of only 0.06 percent.

The bulk of the Plain is between 50 and 130 feet in elevation, with occasional scattered small hills set within the network of subtle swales and small creeks. Slopes within the swale systems range between approximately five percent (20:1) on the steepest swale side slopes, to virtually flat pool bottoms in the larger basins. More typical side slopes and pool bottoms are between 0.5 and 2.0 percent (200-to1 and 50-to-1 respectively), with many areas exhibiting nearly level terrain between the drainage swales.

With high clay soils, poor downward percolation, and very low gradients, much of the landscape is saturated or inundated for prolonged periods during the winter, and topographic variation dictates which sites pond and which experience simple soil saturation and/or sheet flow drainage. Because of the very low east-west gradient, many areas of undisturbed swales form braided systems, with extensive inter-swale connections.

Historic agricultural land use (including grading, ditching, cultivation, and irrigation) and more recent residential development have altered the Plain's topography, generally leveling out the more pronounced undulations and interrupting or eliminating many of the longer swale systems. Even in areas where intentional land leveling has not occurred but cultivation has, the ground surface has lost considerable relief through repeated discing.

2.1.3 Hydrology

General Processes - The hydrologic processes of the Plain include three primary components, including (1) simple overland (sheet) flow, (2) impeded infiltration, and (3) perched water tables. General overland sheet flow results in the collection of runoff across gentle gradients and into low surface features (including pools and swales), and eventually into more well defined drainageways. All watercourses in the study area ultimately drain to the Laguna, although many headwater systems form extensive meandering and interconnected swales before they collect into well defined waterways. On the heavier, largely impermeable soils (e.g., Clear Lake clay), overland runoff is the predominant hydrological phenomenon, although some minor downward percolation does take place. Even on the more porous soils, lateral surface runoff or sheet flow is important during intense storm events when infiltration is limited by the fine textured soils (Miller et al., 1972). Sheet flow operates throughout Plain, on low gradient landscapes and steeper slopes.

Table 1. Summary of primary soils on the Santa Rosa Plain

Soil series	Phases	General Charact r	Typical Hydrology	G neral Drainage Class	Restrictiv Layer ?	Supports Wetland ?	Notable Species or Qualities	Extent in Study Area
Huichica	H. loam, ponded; H. loam, shallow; H. loam, shallow, ponded	fine textured clay loam over buried dense clay & cemented layers; minor shrink/swell; extr. hard when dry	seasonally perched water table (<2 ft deep) above buried restrictive layer	somewhat poorly drained	Yes: dense clay at 10-30 in.; + occ. deeper cemented alluvium & ash	Yes: seasonal saturation and ponding; often shallow or intermittent	LABU; northern part of study area	14,000 ac
Wright	Wright loam; Wright loam, wet; Wright loam, shallow	fine silty loam over buried dense clay & marine sediments; moderate shrink/swell	perched water table (<2 ft deep) above buried restrictive layer	moderately good to somewhat poor	Yes: dense clay at 1.5 to 3 ft.; often to 5 ft. depth; silty clay surface loam	Yes: seasonal saturation and ponding; often with deep, persistent vp.s	LIVI; CTS; middle part of study area	15,000 ac
Clear Lake	Clear Lake clay; Clear Lake clay, ponded; Clear Lake clay loam	dense clay from surface to 5-6 ft. depth; occ. surface clay loam; extreme shrink/swell	seasonally ponded where surficially undrained; often not staurated	'drained' or 'undrained' relative to topography	Yes: hard dense clay from surface to many feet thick; may have surf. loam	Yes: surface ponding once wetted; topographically dictated	Triteleia peduncularis, Lolium, Poa annua, Brodiaea elegans	6000 ac
Haire	Haire clay loam; H. fine sandy loam hummocky	clayey loam over clay subsoil and cemented valley alluvium	seasonally perched water table above restrictive layer	moderately well drained	Yes: buried clay layers, plus clayey surface soil	scattered		2000 ac
Zamora	Z. silty clay loam	loam & clay loam over clay loam subsoil and recent alluvium; scattered clay lenses, fine texture	intermittent saturation; occasional perched water table	well drained	Yes/No: subsoil is clay loam, not clay; scattered clay lenses	Yes/No: some areas become saturated, others drain	not reliably wet; may be without wetland character in dry years	4000 ac urban, alluvial fans
Other potential wetland soils:	Cotati fine sandy loam; Yolo clay loam; Pajaro clay loam riverwash; Los Osos clay lm.	surface loams over buried clays; scattered water tables over buried clay; some may be well drained	seasonal saturation and perched water tables; scattered ponding	moderately well drained to somewhat poorly	Yes?: typically w/ clay subsoil; may also have cemented alluvium	Yes/No: scattered ponding, extensive saturation	highly variable; minor acreage	3000 ac
Non-wetland soils:	Yolo, Spreckles, Goulding, Cole, Felta	loams on slopes and fans with no clay subsoil; incl. fine alluvial (sandy) soils; Yolo may be riparian	seasonal but intermittent, and typically less than full saturation	well drained to excessively well drained	typically not	No, but may support riparian vegetation	largely around periphery of valley & on major tributary fans	7000 ac

Source: Miller, et al, 1972 (SCS Soil Survey of Sonoma County)

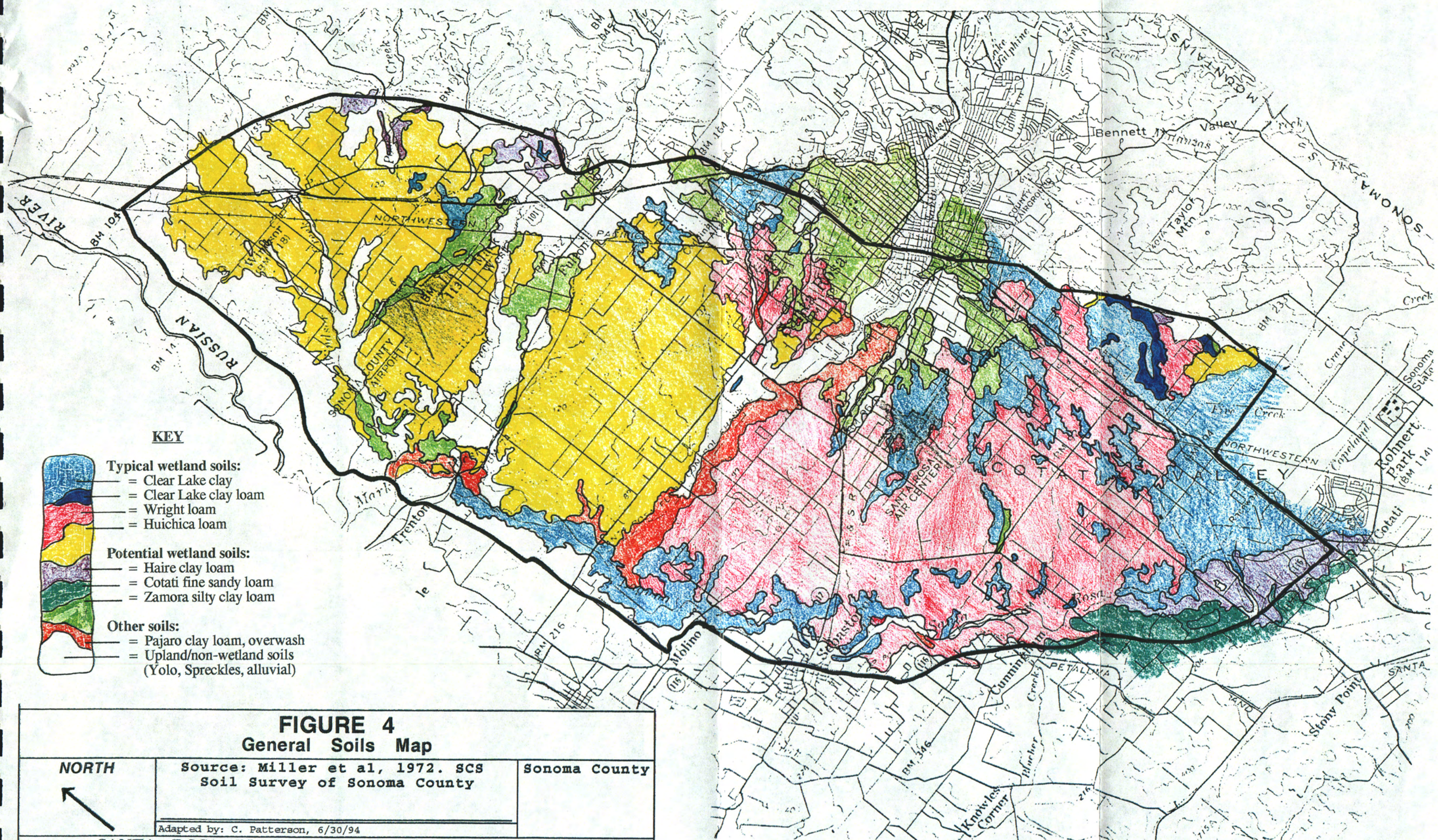


FIGURE 4
General Soils Map

NORTH	Source: Miller et al, 1972. SCS Soil Survey of Sonoma County	Sonoma County
↖	Adapted by: C. Patterson, 6/30/94	

SANTA ROSA PLAIN WETLAND BASELINE STUDY

The Plain's very low gradient and high clay soils work to retain runoff in low topographic areas (pools and swales), especially during intense storm events when the low natural rates of percolation cannot keep pace with the precipitation input (Miller et al., 1972) Hanes, 1991; Vandivere, 1993). With average or wetter winter weather, most basin and swale terrain attains full hydrological capacity and discharges surplus water toward the Laguna. If average precipitation is received in a widely distributed seasonal pattern, the lowest places retain water for the entire winter and early spring. The duration of ponding and saturation during dry periods depends on soil porosity, depth to and integrity of restrictive layer, and other factors.

The third hydrological phenomenon in the study area (and one which greatly influences the formation of vernal pools and wet swales) is the regionally typical formation of a perched water table in the silty clay loams that lie on top of the buried clay layer(s). On these soils (primarily Wright and Huichica), early season rainfall is able to slowly percolate into the surface loam, resulting in relatively little runoff and few areas of standing surface water. However, as the surface soil mantle becomes fully saturated, the formation of the perched water table occurs on top of the buried clay layer, eventually rising in the soil profile as more rain is added to the system. Once the water table has formed (generally achieved after about eight to 12 inches total season-to-date precipitation), subsequent rainfall input tends to reach the surface and fill the lower portions (vernal pools) of the swale systems, and spillage down-swale occurs. With average rainfall, full soil saturation and surface discharge from such water table systems occurs in about mid-December.

Precipitation Effects - Variation in annual precipitation ranges from low years of only 13-15 inches (1975-77, 1938, 1919) to over 50 inches (1982, 1940), with an average of about 30 inches at the Santa Rosa recording station (see Appendix A). In years of average or greater precipitation, the study area's pools and swales receive a surplus of water required for full inundation and saturation, and season-long duration. Hydrologically, wet and dry years are extremely different, with average or greater total precipitation resulting in considerable ponding and overall system outflow, while in dry years (depending on seasonal distribution) the total rainfall may lead to minimal (or no) ponding and little spillage from the swale systems to the Laguna. In drier years, such as the six ending with 1991/92, certain sites with other wetland characteristics may not qualify as "jurisdictional wetland" according to the Corps' hydrologic requirements. With no significant ponding, the shallower pools in dry years and most swales in all years can be dominated by non-native "Facultative" vegetation (i.e., having neutral wetland indicator status) as classified by the Service's list of wetland plants in California as part of the National Wetland Inventory (NWI, 1988).

Under wetter conditions (such as in the winter of 1992/93 or the first half of 1993/94), the study area's generalized soil mantle becomes fully saturated by approximately late December (C. Patterson, unpubl. field data), and a perched water table forms. On a Zamora soil in southwest Santa Rosa, Vandivere (1993) calculated that rainfall in excess of 11.2 inches (cumulative) will result in surface runoff, and Hanes' (1991) discussion of a site west of Santa Rosa identifies 16.6 inches as the potential evapotranspiration for the general Plain. Under both weather regimes (dry and wet), however, the network of collecting swales become saturated and generally remain so for a prolonged period, even with low amounts of rain, as runoff (surficial and subsurface) moves very slowly down-swale. Because of the wide fluctuations in annual precipitation (both total amount and temporal distribution), pools and swales in the study area exhibit a very wide range of growing conditions. Individual sites can vary from essentially dry all season in droughts, to full and spilling almost all season long, as well as every regime of depth and duration in between.

Vernal Pools and Swales - The majority of wetlands on the Santa Rosa Plain, and those most commonly associated with sensitive species, are seasonal in character. They result from poor drainage and restricted percolation, combined with low gradients, high clay soils, and rainfall in excess of that used in evapotranspiration. In general, the study area's lowest topographic positions receive almost immediate inflow from intense rainfall that cannot infiltrate, as well as subsequent inflow from saturated soils upslope once the landscape has become fully charged. As the rainy season progresses, the soils become fully saturated, pools form, and fill to the point where overflow spillage moves downslope. Later in the season and between storms, very slow

subsurface lateral flow from the surrounding upland's water table (a perched aquifer) recharges the nearby swale bottoms and pools, extending the time that the water table occurs in the lower elevational areas. This slow subsurface drainage on top of the buried restrictive layer contributes inflow (recharge) to the pools themselves, extending their periods of ponding (C. Patterson, unpubl. field data, 1991 to 1994).

Because of the landscape's pervasive underlying clay, this phenomenon occurs not only in areas of lowest absolute elevations, but also in areas of lowest relative topographic positions. The result is a soil mantle that is influenced virtually throughout the study area by perched water tables, and a resulting mosaic of interdigitating wetland and upland that occurs regardless of absolute elevation, often varying across a given site. Pools and swales that exhibit saturated soil may occur only a few inches below a side slope with upland vegetation, and may also occur at elevations higher than nearby areas of upland. Depending on the depth to the clay layer and the local topography, such perched water tables can occur at even the highest elevations, with both wetland and upland conditions potentially occurring at all absolute elevations on a site.

Vernal pools in the study area include a range of sub-types, including shallow, intermittent pools and others that are larger, deeper, and more persistent. Many factors influence the water depth and duration characteristics of a given pool, and few sites experience the same conditions from year to year. Basins with large watersheds (more than a few acres) tend to fill sooner, with less cumulative rainfall, and persist longer (and are hence more stable), while perched flats and headwater depressions may require more precipitation to become inundated or saturated, and are generally more apt to dry out during dry periods between storms. Areas with thicker layers of loam on top of the denser clay also require more rainfall to become fully saturated and/or ponded. At the wetter end of the Plain's spectrum of seasonal wetland hydrology are the backwaters and floodplain lowlands along the immediate Laguna corridor. These areas become (and remain) ponded from major creek overflow and are influenced by the total runoff on all lands upslope in the drainage.

While a certain amount of cumulative precipitation (typically 8 to 15 inches) is necessary for pools to form on most soils with a surface loam, pool formation on dense clay, primarily the Clear Lake series, can occur soon after the first major rains of the season. Some soil wetting and crack closure must occur first, but these clays swell quickly when wetted and create effective surface barriers to infiltration. Subsoil water tables are generally not present in these soils, and without lateral recharge from the perched aquifers, these areas are often subject to rapid and frequent in-season drying. Clayey lands that have been under long-term or especially heavy livestock use can exhibit localized surface soil compaction to the extent that ponding occurs above a soil profile that is not saturated or even fully wetted (C. Patterson, D. Martel, unpubl. field data).

Creeks and Channels - Numerous small ephemeral creeks cross the Plain, all eventually joining the Laguna which flows north to the Russian River, just northwest of the study area. These creeks consist of eroded or incised channels ranging in width from a few feet to about 40 feet, typically with steep dirt banks and patchy riparian oak woodland of coast live oak, valley oak, bay, ash, walnut and, occasionally, willow. These creeks, while representing jurisdictional "waters of the U.S." as intermittent streambeds (bed and bank), do not provide habitat for the wetland species emphasized in this study and were not surveyed or characterized in detail. However, it is recognized that they do play a vital role in the overall drainage patterns and hydrology of the Plain. They may also provide habitat for other aquatic species of concern such as the California freshwater shrimp. With remnant pockets of riparian woodland and thicket, these features represent a wetland resource of considerable value, but with much different hydrology and more common vegetation than the study area's seasonal wetlands. Many of the Plain's streams have been converted into deeper, wider trapezoidal (flood control) channels, often without any significant woody vegetation.

The more well-defined creeks serve to hydrologically divide the Plain into separate drainage systems and hence naturally isolate many of the vernal pool and swale networks. These creeks also drain many of the swale and pool systems that occur on the Plain, providing a slightly deeper, more effective drainage route from the flatter portions of the landscape. Historically, it appears that some of the creeks actually aided in supplying the Plain's swales and vernal pools with water by

serving as runoff routes for rainfall originating in the hills to the east. As major pulses of runoff moved westward across the Plain in these creeks, the higher flows overtopped the low creekbanks and spread across the Plain. In dry years, this probably did not occur. With uncontrolled runoff and such periodic overflow, the creeks may have aided in the formation and maintenance of the swale and pool topography by providing periodic scouring.

Through historic and recent development on the Plain, however, many of the creeks have been converted to deeper, more efficient flood control channels. These new channels facilitate more rapid and complete drainage from the Plain, as well as conveying eastside runoff through the study area with minimal (or no) bank overtopping. The overall effect of this channelization is not well-documented, but is likely to include dewatering of portions of the study area. Larger creeks also serve as migration routes for numerous aquatic species, including several non-native predators (e.g., crayfish and mosquito fish) of the native seasonal wetland fauna.

Historic Hydrological Alterations - The construction of major regional flood control channels, storm drains, and roadside ditches has reduced the occasional intense bursts of runoff that historically spread across the Plain, thus reducing the attendant scouring, and potentially affecting the natural dispersal and redistribution of wetland seeds and other propagules. The modern system of ditches and channels contributes incrementally to an overall dewatering of the Plain, both in the urban areas where primary flood control via large channels and buried drains, and also across the lower (western) parts of the Plain where such channels continue to convey runoff toward the Laguna without any appreciable bank overtopping.

While not necessarily draining surface swales or pools directly, such channels (in places) also cut down through the soil profile to well below the top of the underlying restrictive clay layers and facilitate drainage from the adjacent lands. This allows faster and more complete lateral movement of water out of the perched water table system and into the deeper creek channel. Lateral water movement is naturally very slow because of the fine textured soils and very low gradients. Flood channels and primary ditches do not necessarily drain the topsoil aquifer quickly or completely, but probably reduce to some degree the water table's extent and duration, and may also cause adjacent sites to dry out more rapidly in the spring.

Other hydrological alterations have occurred where historic cultivation or other land uses have reduced or eliminated the local topographic variation. Repeated discing and land leveling have evened out the landscape, and many orchard situations historically involved the creation of broad ridges on which trees were planted, and lower man-made drainage swales. Combined with extensive localized ditching, this too has a dewatering effect, shunting more rainfall away from potential topsoil percolation to sheet flow collection and offsite conveyance. Most of the Plain has been subject to at least some local efforts by farmers to facilitate drainage, and areas previously used for orchards and row crops have been graded to make them more usable.

2.1.4 Flora and Fauna

The natural vegetation of the Santa Rosa Plain includes primarily oak savanna, oak woodland, riparian forest and thicket, and valley grassland. The predominant cover was a mesic valley grassland of California oatgrass, purple needlegrass, blue wildrye, creeping wildrye, squirreltail, meadow barley, numerous annual and perennial herbs, wildflowers, and in the wetter places, California semaphore grass. Several oak species (valley, Oregon or Garry, coast live, blue, California black) formed open savannas and woodlands of moderate density. Creeks supported mixed riparian woodland and thicket vegetation, along with pockets of freshwater marsh, riparian herbs and scrub. Historic land use, however, has drastically altered both the vegetation and flora throughout the study area. Large areas have long since been cleared of trees and virtually all land has been affected to some degree by livestock grazing and non-native species invasions (e.g., *Lolium, Bromus, Avena, Hordeum, Brassica*).

The native flora is rich in grassland species associated with several different natural plant communities, ranging from dry-site needlegrass and annual wildflower communities, to meadow, wet meadow, and vernal pool. These communities support numerous common upland grasses and

herbs (e.g., *Stipa, Elymus, Sitanion, Lupinus, Amsinckia, Ranunculus, Collinsia, Platystemon, Sidalcea, Wyethia, Calochortus*), meadow and swale plants (*Danthonia, Juncus, Sisyrinchium, Brodiaea, Orthocarpus*), and vernal pool species (e.g., *Downingia, Lasthenia, Plagiobothrys, Lilaea, Pleuropogon, Eleocharis, Eryngium*), including several regional endemics. Oaks are the dominant trees, and there are few shrub communities. Appendix C is a checklist with scientific and common names for plants the Santa Rosa Plain.

The entire valley has been grazed by livestock in the past, and much of it continues to be so managed. The native vegetation generally does not flourish under the current grazing regimes, and numerous well-adapted exotic weeds (including *Bromus, Hordeum, Brassica, Centaurea, Plantago, Picris, Raphanus, Lactuca, Convolvulus, Rumex*) and forage species (e.g., *Lolium, Avena, Trifolium, Poa annua, Festuca, Melilotus*) are widely established. Continued and intensified land use (e.g., vineyard, orchard, row crops, irrigated pasture, wastewater disposal, residential) has eliminated most of the native vegetation and favors the non-natives. However, there are pockets and scattered isolated features where natural soil and hydrological conditions persist and human and/or livestock disturbance has not been severe, and where the native flora survives. Wetland habitats in particular have more effectively weathered the effects of livestock, weeds, and other ecological disturbances.

Vernal pools and the deeper swales support most of the threatened and endangered plants on the Santa Rosa Plain. Many of the species found in these habitats are restricted to the temporary aquatic environment provided by the vernal pool habitat. Geographically, the vernal pool plant community is inherently uncommon because of the unusual combination of soils, climate, and hydrology its habitat requires. Vernal pool habitat (often with an unique local flora) is limited to portions of California, South Africa, Chile, and Australia (Thorne, 1981). The flora of Sonoma County's vernal pools is unique, containing a number of common species in addition to three regional endemics.

The long evolutionary history that culminated in the Santa Rosa Plain ecosystem was undoubtedly complex and involved the interactions between numerous upland and wetland species and communities. There is relatively little left, however, of the natural flora and vegetation, or the processes which formed them, and extensive fragmentation and displacement by non-natives have occurred, to the point where understanding all of the natural interrelationships between plants, animals, pollinators, herbivores, predators, and decomposers may not be possible in this region.

Under pre-settlement conditions, native wildlife played a much greater role in the ecological processes of the Santa Rosa Plain and its wetlands. Wildlife functioned as grazers, predators, and burrowers, but have been displaced and their ongoing influences (such as soil turning, seed scarification, pollination, and other food chain relationships) have diminished. Currently there is a new community of agricultural, introduced, accidental, and domestic animal species (including livestock, starlings, opossums, rats, dogs and cats, crayfish, mosquitofish, bullfrogs, etc.) that are competing with the natives. Current faunal influences include predation on native aquatic species (frogs, salamanders, invertebrates) by introduced crayfish, mosquito- and other freshwater fish, harassment of birds by dogs and cats, plus the continued disturbance of topsoil and vegetation by concentrated assemblages of agricultural animals.

2.1.5 Human Settlement

No research has been done for this report regarding the timing and degree of initial human settlement in the study area, but it should be recognized that settlement by man constitutes the greatest single factor affecting wetlands in the study area. The landscape here has been subject to numerous agricultural land uses and physical changes over at least the past 100 years. Early settlers brought livestock, introduced exotic vegetation, cut down trees, and began working the soil. Modern land use has involved a wide range of disruptive activities, ranging from intense land leveling, cultivation and irrigation, to complete development for urban uses. Continued use of the land has resulted in the conversion of native grasslands into non-native annual types, while large areas of oak woodland have been removed to facilitate all types of agriculture.

2.2 Habitat Types

2.2.1 General Conditions

The study area's pristine landscape contained a complex mosaic of grassland and oak savanna, extensively interspersed with meandering swales and vernal pools. That situation has been significantly modified, however, and it is apparent from historic air photos and remnant undisturbed parcels that oak woodland and savanna were much more extensive prior to human settlement. Waaland et al. (1990) estimate that over 90 percent of the oak woodland and savanna habitats have been converted to other uses and vegetation cover. Modern land uses have lowered the higher ground and filled in the lower areas (swales and pools), while ditches, roads, and checkerboard land use patterns interrupted the natural drainages and overall habitat continuity.

Upland areas (grasslands and oak communities) are much easier to farm or cultivate, and the non-wetland habitats have subsequently been altered the most, with tree removal occurring to clear the land for agriculture, and nearly complete conversion of the naturally occurring grasslands to non-native annuals and introduced forage species. The remaining wetland habitats, on the other hand, even though they have been the subject of extensive draining and filling activities, have retained significant pockets of remnant native vegetation. Since the topographic depressions are seasonally unusable for farming and ranching (because of their wetness) and still contain the hydrologic conditions that favor native wetland annuals, these habitats have suffered less intrusion by introduced species. Even these areas, however, are largely surrounded by disturbed habitats, and where they are less well-developed, are routinely cultivated, grazed, or otherwise affected by agricultural land uses during the drier part of the year. Heavily grazed and cropped (hay) lands with swale and pool habitats exhibit a combination of weedy wetland vegetation (e.g., *Rumex, Xanthium, Polypogon, Cyperus, Mentha,* etc.) in addition to the native wetland flora, with the deeper pools retaining more of the natural character than the shallower swales.

The region's broad swales in particular are highly vulnerable to the invasion by introduced grasses and the degrading effects of grazing and cultivation. Since swales are relatively dry (intermittently saturated versus ponded) and often poorly defined, the native flora is at a competitive disadvantage compared to the aggressive and highly adaptable non-native grasses and weeds that flourish in such habitats. Such species as Italian ryegrass, Mediterranean barley, curly dock, and annual bluegrass are well adapted to clayey soils and prolonged soil saturation, making them effective competitors with the native meadow flora of the swale habitats. In the larger and deeper basins (vernal pools), even dry years generally include some surface inundation. This is effective in drowning the non-native grasses and reducing competition for the native species. Still, even the more well-developed and stable wetlands are vulnerable to invasion by non-native wetland species such as dock, mint, umbrella sedge, rabbitfoot grass, cocklebur, lippia, and others.

A second factor that places the vegetation of the more subtle swale and shallower pool features at greater risk to invasion by exotics is that the relative dryness in these features allows them to be used, cultivated, grazed, and/or irrigated during a major part of most years and all year in some. These influences favor the non-native annual grasses and weeds over the native species. While repeated discing tends to reduce micro-relief, encourage exotics, and adversely affect natives, occasional situations where the opposite is true also exist. Even where the physical conditions have remained relatively undisturbed, natural swales are often dominated by dense, depauperate stands of *Juncus*, mint, *Eryngium*, and several non-natives (i.e., *Lolium, Hordeum, Rumex, Vulpia, Polypogon, Lythrum, Cyperus*).

2.2.2 Uplands

Prior to human settlement, oak woodland/savanna and grass communities dominated throughout the valley region, overlain with an intricate network of topographic drainage swales and pool complexes. However, most woodland has been cut and much of the native grassland in the study area has been converted to either a non-native annual type or cropland. Pockets and minor elements of the native grasslands still occur in the study area, but continued and intensified use of the land

prevents any significant recovery of the native upland vegetation. The following are brief descriptions of the study area's non-wetland plant communities (* denotes an equivalent community to that described by Holland, 1986):

Non-native Annual Grassland* - This is the most common vegetation type in the study area and is composed of clay-tolerant introduced species such as Italian ryegrass, bromes, wild barley, vetches, wild oats, lupines, and tarweeds, plus numerous agricultural weeds (e.g., *Erodium, Raphanus, Brassica, Centaurea, Rumex, Lactuca, Picris*). It is highly variable in species composition, and occasionally blends with the more perennial types. A total of roughly 6,500 acres of this habitat was identified on the Plain by Waaland et al. (1990). Some annual grassland patches are relative large, especially in the southeastern part of the study area, and there are many smaller scattered parcels and vacant urban lots that consist of this type. Annual grassland is dominant over most undeveloped regional uplands, including vacant land, livestock pasture, and many hayfields.

Perennial Grasslands - Occasional sites where disturbance has been minimal still support pockets of native grassland types, including valley needlegrass grassland* (with *Stipa, Danthonia, Elymus*), valley wildrye grassland* (*Elymus triticoides*), and wildflower field* (including *Brodiaea, Lupinus, Collinsia, Sidalcea, Sisyrinchium, Wyethia, Ranunculus*, etc.). The more mesic upland situations in the study area are largely dominated by California oatgrass, while the wetter areas (swales) typically support oatgrass, meadow barley, semaphore grass, and seasonal wetland herbs.

Irrigated Pasture - There are approximately 4,500 acres of intensely managed pasture in the study area, most of it irrigated with reclaimed effluent and used for sheep and cattle grazing or cultivated for hay, silage, and/or green-chop. The dominant species include forage grasses (e.g., *Lolium, Festuca arundinacea, Poa annua*) and herbs (e.g., *Vicia, Trifolium, Melilotus*). This habitat mixes with irrigated oak woodland in the central part of the study area, but is most widespread north of Highway 12. The distribution of this habitat type is largely controlled by a network of pipelines which supply reclaimed water. Although a certain percentage of this type was once oak savanna or woodland, most of the current irrigated pasture occurs in areas that were historically probably native grassland. There is also considerable acreage of historic or even remaining seasonal wetland that is now used as irrigated pasture. The natural topographic and hydrologic conditions are in many cases still present, but in addition to either cropping or grazing, the out-of-season irrigation renders such areas unsuitable for most native species, wetland and/or upland.

While not causing any direct filling or disruption of the physical wetland habitats, summer irrigation represents a major threat to native plants and vernal pool endemics in the study area. One of the only natives to persist under intensely cultivated wet situations is western manna grass (*Glyceria occidentalis*). On the other hand, land which has been under such land use is likely to be highly suitable for habitat and natural plant community restoration since the fundamental physical habitat conditions have not been lost.

Oak Woodland - The denser oak woodland habitats typically have several structural layers (groundcover, shrubs, understory trees, mature canopy trees) and higher species richness than most of the other upland habitats in the study area. In the valley setting, the most common communities are valley oak woodland*, coast live oak woodland*, and black oak woodland*, with very minor scattered representation by blue oak woodland*, Oregon oak woodland*, and mixed north slope cismontane woodland* in the hills along the study area's western edge. Valley oaks in particular are naturally dominant and still relatively common, although they now occur largely as lone individuals and small isolated clusters. Only a few fragmented sites are still known to support this denser type of oak habitat, and even these examples have been generally overgrazed. Oaks still occur in open savannas on the larger rural parcels, and California black oak occurs in some abundance in protected pockets and riparian zones in the study area.

While the lack of native oak regeneration is currently a serious issue related to land uses, droughts, native browse pressures, and other factors, there are currently numerous sites in the study area with abundant oak regeneration, including valley and coast live oaks. Many such sites are abandoned fields or orchards that have recovered in the last 20 years. Virtually all grazed, disced,

and intensively irrigated land, however, is devoid of such regeneration.

Oak Savanna - The more open wooded areas are referred to as savanna, and commonly support the same main species of trees, just in very low densities. These areas tend to occur on drier sites than the woodlands, however, and the most dominant trees are valley oak and blue oak. In terms of classification, they most closely resemble the open phases of valley oak woodland* and blue oak woodland*. Previous studies have identified approximately 1,300 acres of savanna habitat out of a 28,000 acre study area (Waaland et al., 1990). These remnants are scattered across the Plain in fragments of varying size, including several large tracts in the west-central part.

Natural savanna communities were probably some of the richest and most productive, supporting dense grasslands, upland and wetland, vernal pools, small creeks, and large mature valley oaks at widely spaced intervals. Essentially all of the grassland now present where oak savanna still exists is non-native, and most current land uses on these lands preclude oak regeneration. A few lowland pockets that have not been completely converted to agriculture and/or non-native grassland still support oak savanna with a relatively natural wildrye grassland* and stands of California oatgrass. Savanna habitats are valuable to wildlife, but only in relatively large tracts. While small, densely stocked woodlands can remain productive, and wetlands and grassland often persist in small fragments, savanna requires larger areas to be viable habitat for wildlife.

Irrigated Oak Savanna - Previous studies have identified about 1,500 acres of irrigated valley oak savanna on the Santa Rosa Plain, accounting for more than half of the total remaining oak savanna. Most of this acreage is located south of Highway 12 and between the Laguna de Santa Rosa and Santa Rosa city limits. Italian ryegrass and hare barley (*Hordeum leporinum*) are the most common grasses, and Italian thistle (*Carduus pycnocephalus*) frequently occurs in dense stands under the canopies of oaks. Studies by Waaland et al. (1990) on three farms near the Laguna indicate that mature oaks have been lost under intensive irrigation. Summer (wastewater) irrigation is generally not compatible with native oaks, and irrigation represents a primary concern regarding the future of the study area's remaining oaks.

Cropland - Approximately 1,000 acres of this habitat type are located in the study area. Essentially all of it occurs north of Occidental Road in areas of the Laguna and Santa Rosa Creek floodplains. Most of the cropland is composed of corn grown for silage. The better alluvial soils along the Santa Rosa Creek floodplain support row crops grown for commercial produce. Much of the Laguna floodplain cropland is flooded into early spring, reducing the effective growing season. Because the entire land surface is devoted to the production of an annual crop, there is continual and complete disturbance which maintains a uniform appearance and homogeneous species composition.

Orchards and Vineyards - This habitat type accounts for 3,800 acres, or 14 percent of the study area. Most of it is distributed in the northern portion, composed predominantly of vineyards. Grape vines are intensively managed to remain on trellises no more than five feet in height. Vines are normally intertwined in the rows, but remain open between rows. The grape is deciduous, reaching fruition in the fall, after which leaves drop. Between rows, grasses, herbs, and weeds may be allowed to grow, especially in the winter when the vines are dormant. In the spring and throughout the growing season the grasses and herbs are treated with herbicides or disced to prevent growth. Minor amounts of walnut orchard are also present; those in the south portion of the study area appearing to be abandoned. Some pear orchards are present in the northern portion. The fruit and nut trees are deciduous and range in height from 15-30 feet.

Urban - This land use type accounts for 7,000 acres, or about 25 percent of the study area. Included in this category are rural residences, subdivisions, ranchettes or businesses clustered at densities approximating one unit per five acres or less. Also included in the urban habitat are city parks and golf courses. The structure of urban vegetation varies, but is almost exclusively composed of non-native species and occurs in close proximity to homes and roads. Tree groves are common in golf courses, and shade trees and lawn are probably the most common vegetation features in the residential settings.

Occasional undeveloped parcels as large as 25 acres occur in the urban category, but these are typically surrounded by moderate and high density residential use. These urban islands of predominantly volunteer vegetation typically include annual grassland, scattered individual oaks, and/or occasional remnant pockets of seasonal wetland and vernal pools. While such habitat islands are generally less valuable for wildlife as their acreage diminishes and the degree of encroachment increases, they can still represent suitable habitat for any of several sensitive species (primarily plants and invertebrates). Further, while a great degree of degradation has already occurred on most vacant urban lots, wetland conditions are known to remain in places, with some still supporting sensitive species. Even where somewhat larger parcels may remain undeveloped within the urban area, a general loss of habitat value results from increased physical disturbance, increased predation from domestic pets, and competition from introduced grasses, weeds, and exotic animals that are better adapted to urban influences.

Somewhat larger and less degraded parcels occur along the urban fringe, combining the higher habitat values of less developed land with the typical ongoing disturbances of the urban land uses nearby. Ditching and draining are not as well developed as in the fully urbanized areas, and agriculture is often limited to personal use (e.g., a few horses or a garden), or may be abandoned altogether. Sensitive wetland resources still can occur on such lands, but because of the proximity to urban use, are often threatened by the encroaching influences and the pressure to expand the urban environment.

2.2.3 Wetlands

The study area contains a wide range of wetlands, from the riparian woodlands and thickets, flooded backwaters, and perennial wetlands along the major creeks and the Laguna, to the saturated flats, vernal pools, and shallow swales in the headwaters that dry by late May. Most of the area's wetlands are seasonal in character, becoming saturated or inundated during the winter, only to dry relatively quickly once the rainy season is over. Figure 5 shows a generalized cross section of the Plain's seasonal wetlands. Interspersed throughout the region are agriculturally influenced (and unintentionally created) wetlands such as flooded fields, man-made swales and ditches, and relatively flat cultivated ground that can become and remain saturated long enough to qualify as jurisdictional wetland (yet remain unponded).

There are several different definitions of wetland used in regulatory and planning processes, and the Santa Rosa Plain contains numerous habitat types that qualify. For purposes of this report, wetlands are used in accordance with the technical definition of "jurisdictional wetlands" subject to regulation by the Corps under the CWA. These are vegetated features that exhibit evidence of (1) hydric soil, (2) a predominance of hydrophytic vegetation, and (3) wetland hydrology (prolonged saturation or inundation). Vernal pools and swales are included in this definition and activities in them are regulated. Land that is hydrologically altered and used to produce an annually harvested crop may be fully saturated and exempt from Corps jurisdiction as Prior Converted Cropland (PCC) or may be jurisdictional as Farmed Wetlands if inundated. These are two habitat categories that occur on the Plain which are recognized and treated differently than unmanaged isolated wetlands under the CWA. Other potentially jurisdictional habitats (but not necessarily technical "wetlands") on the Plain include, intermittent and perennial streams, abandoned ditches and ponds, and flooded fields. The following are brief descriptions of the most prominant or important wetland types in the study area:

Vernal Pools and Swales - Of greatest concern and importance with respect to the study area's endangered species are seasonally wet swales and vernal pools, especially those that have not been drastically altered or degraded. Shallow basins and sheet flow drainages typically become seasonally saturated and/or inundated for prolonged periods in the winter and spring. They include a range of subtypes, from simple surface depressions and very shallow, intermittent vernal pools on dense clay soils, to deep meandering swale/pool networks that are fed by larger upslope watersheds. In general, the Plain supports shallow, intermittent pools and broad swales in the headwaters (which fill and function largely with simple direct rainfall), with deeper and more convoluted systems of pools and swales farther downslope to the west (where larger upslope watersheds tend to foster more stable hydrological conditions).

Swales can be narrow (less than five feet wide) or up to 50 feet or more wide. They are characterized by more-or-less complete surface drainage (i.e., no standing water) after storm runoff stabilizes. Swales do not have defined bed or bank characteristics, and defining the outer boundary of most swales is difficult. Physically, a swale consists of the lower topographic portion of a broad concave drainage feature, typically including the area below the side slopes' points of inflection. Swales can consist of wetland (with prolonged soil saturation to the surface) or upland, seasonally waterlogged or relatively well-drained depending on soil texture, underlying horizons, and slope. Swales provide habitat for many native vernal pool and meadow species, as well as conditions for several native grasses. Swales are not specifically described as a plant community by Holland (1986), but locally, these habitats most closely resemble a combination of freshwater seep* and a low elevation form of montane meadow*. Other terms that could be used to describe these habitats include low elevation meadows, or mesic valley grassland.

Vernal pools are the topographic low areas, occurring either alone or within larger swale networks, which under average weather patterns become seasonally inundated for prolonged periods after storms. Such inundation is sufficient to favor specially-adapted wetland vegetation, with the surrounding grassland and swale communities (predominantly grasses) yielding to the unique pool assemblages dominated by annual herbs and wildflowers. Such seasonal pools in the study area include natural and man-made basins, and range from a few square feet to more than one acre in size. They support both native and naturalized vegetation, and vary from being intermittently inundated one or two inches for a few weeks at a time, to more than two feet deep and persisting in excess of 120 days. Several different habitat zones suitable for different plant species and assemblages occur in natural pools of this region, responding generally (and over time) to water depth and/or duration. The study area's vernal pools do not fit any of Holland's (1986) categories, but most closely resemble the northern claypan vernal pool*, and occasionally exhibit qualities of freshwater seep* and vernal marsh*. The Plain's vernal pools result less from cemented alluvium and/or deposited clay lenses as described by Holland, and more in response to the region's pervaisve underlying clay base.

Pools that contain, on average, roughly several inches up to about 12 inches of water foster a rich pool flora of native annuals (e.g., *Lasthenia, Downingia, Plagiobothrys, Gratiola, Blennosperma, Eryngium, Lilaea, Callitriche, Pilularia, Navarretia, Mimulus, Pogogyne, Juncus, Orthocarpus, Trifolium, Pleuropogon,* and others) while deeper pools tend to be sparser and contain only a few aquatic species (primarily *Lilaea, Callitriche, Eryngium, Pleuropogon, Glyceria*). Infrequently, such aquatic plants as elodea (*Elodea*) and *Zannichellia* are found in the more persistent pools.

Shallower pools and some swales are also excellent habitat for most pool species, but are vulnerable to recurring drought and non-native grass invasion. Dry years favor the exotics in such shallow basins, swales, and perched flats, resulting in mixtures of non-native annual grasses plus scattered small colonies of native wildflowers. In dry years, the natives may not be evident (shaded and outcompeted by the exotics), while in wetter years, elevated water levels and longer hydroperiods drown the grasses. Wet years favor the native species which are able to grow with less competition and are able to produce better seed crops. Over the long term, some of these subtle depressional features are able to maintain small native plant assemblages compared to immediately adjacent uplands where non-native grassland invasion has been more complete. Pools that are heavily grazed tend to show reduced dominance by native annuals, and an increase in exotics (e.g., *Rumex, Xanthium, Polypogon, Polygonum*) and perennials (including *Juncus, Lippia,* and *Mentha*).

Because of the region's poorly drained soils and ample rainfall, many isolated vernal pools in this region fill from direct rainfall alone. In dry years, these features are subject to non-native species invasion and potential native seed bank depletion. Many less well-developed wetlands do not represent significant aquatic habitats and, therefore, do not constitute habitat for fairy shrimp or tiger salamanders. However, several native meadow plants (e.g., *Deschampsia danthonioides, Hordeum brachyantherum, Orthocarpus faucibarbatus, Calochortus uniflorus, Brodiaea elegans, B. peduncularis, B. hyacinthina*) are well-adapted to pool edges, broad swales, and other shallow, intermittent, or non-ponded wet soil conditions. Two of the Plain's three federally listed species

(Burke's goldfields and Baker's blennosperma) are also well adapted to such pool edge conditions. Seasonal pools that are bigger, have a greater depth, and/or have a larger watershed are likely to exhibit more extensive or persistent inundation, and provide a more secure habitat for the native flora and fauna. Analysis of three relatively undisturbed sites in the study area (Waaland et al., 1990) showed the majority of the pools to be one-half acre or less in size. The proportion of these lands occupied by vernal pools was an average of 22 percent, up to as much as 26 percent. Scattered pools larger than one acre are present, however (C. Patterson, unpubl. field data), and some portions of the central Plain appear from air photos to approach 50 percent aerial coverage by pools and wet swales under wet conditions (e.g., March 1991). Still, areas of unaltered natural topography usually do not exceed 20 to 30 percent wetland, except along portions of the immediate Laguna where peak winter backwaters can flood extensive land areas. Interestingly, managed lands that have been excavated, leveled, or which accidentally have surface drainage impeded can reach much higher proportions of wetland (50 to 80 percent).

Valley Foothill Riparian - This generalized woody riparian community occurred historically along most of the larger ephemeral creeks and along all perennial waterways. The dominant cover is a dense blend of oaks (valley, coast live, California black), bay, willows, Oregon ash, California walnut, and infrequent cottonwood, plus understory tangles of introduced and native blackberry, poison oak, wild rose, coyote brush, occasional wild grape and honeysuckle, and numerous herbs (*Artemisia douglasiana, Solidago, Aster chilensis*, etc.) and grasses (e.g., *Elymus triticoides, Danthonia*). The pre-settlement waterways supported a range of woody riparian types, including a predominance of central coast live oak riparian forest*, ("Great Valley") valley oak riparian forest*, ("Great Valley") mixed riparian forest*, and central coast riparian scrub*, plus minor representation by central coast arroyo willow riparian forest*, ("Great Valley") cottonwood riparian forest*, and mule fat scrub*. Along the more ephemeral streams, valley oak woodland and black oak woodland* form more open and less strictly riparian communities.

The present distribution of riparian forest and woodland in the study area is concentrated into two main areas: north of Occidental Road and the Sebastopol forest on the Laguna de Santa Rosa. The total acreage estimated for the Laguna is 450 acres (Waaland et al., 1990). Just as most of the study area's oak savanna has been cut or converted to other types, major blocks of historic riparian forest and woodland have been removed by flood control and channelization projects, agricultural encroachment into the creek corridors, and other land use activities. In large tracts, this community provides suitable habitat for numerous common and sensitive bird species, but only a few scattered and relatively small areas of this habitat type still exist on the Plain. Examination of the maps in Attachment 2 reveals that extensive sections of the Plain's creek corridors have been severely encroached, with an attendant removal of woody vegetation. Except for places near the Laguna, almost all of the remaining woody riparian communities on the Plain consist of very narrow linear (and largely discontinuous) strips of trees left along the immediate waterway's banks.

Freshwater Emergent Wetland - This general habitat type includes coastal and valley freshwater marsh* and vernal marsh*. The dominant plants are native grass-like species (primarily *Typha, Scirpus, Juncus, Carex*), but also include numerous other emergent and aquatic species such as *Alisma, Rorippa, Machaerocarpus, Nasturtium, Jussiaea, Oenanthe, Ludwigia, Myriophyllum, Polygonum, Potamogeton, Potentilla anserina, Lemna, and Wolffia*. Previous studies identified roughly 1,900 acres of freshwater emergent wetland. Of this total, only 150 acres are perennially wet marshes (most occurring along the floodplain of the Laguna), the remainder being semi-persistent seasonal wetlands in areas of Clear Lake clay. This habitat is typified by relatively deep water and/or prolonged (even year-round) wetness, and does not constitute suitable habitat for most sensitive species. Further, the species composition of these marshes tends to be simple and common, and summer irrigation is not necessarily detrimental. Many such habitats in this region have been heavily disturbed and ecologically degraded by excessive nutrient (livestock manure) input and the resultant high biological oxygen demand. Freshwater marsh is typically the type of wetland created by either excessive irrigation and subsequent runoff, as well as through intentional wetland creation involving wastewater disposal and treatment. This habitat type is very productive and has extremely high value for numerous wildlife species, but does not represent suitable habitat for most vernal pool species.

Plate 3. Late season ponding in a deep natural swale, northwest Santa Rosa, 1989. The middle supports *Eleocharis, Pleuropogon,* and *Eryngium*, while the edges are dominated by *Orthocarpus faucibarbatus, Blennosperma bakeri, Lolium, Hordeum,* and *Rumex.*

Plate 4. Natural (non-ponded) swale at the peak of spring flowering, just west of Santa Rosa, 1989. Moving outward from the bottom of the swale, the dominant plants include *Limnanthes douglasii* var. *nivea* (white), *Blennosperma bakeri* and *Orthocarpus faucibarbatus* (yellow), and *Trifolium variegatum* and *Collinsia* (purple) blending into upland.

Seeps and Springs - Seeps and springs are largely absent from the study area since these features typically occur where groundwater reaches the surface on a slope, and such slopes are generally excluded from the study area (which is essentially defined as the valley plain below the surrounding foothills). There are numerous such seeps and springs, as well as perennial marshes and well developed riparian corridors, however, in the hilly region just west of the study area boundary, roughly between Cunningham and southern Sebastopol, north to Graton and Forestville. Several of the historic marshes in this region, such as Cunningham, Pitkin, and those on Blucher and Atascadero creeks are at least partially spring fed, and several have historically contained (and a few continue to support) several sensitive plants. In particular, Sebastopol meadowfoam is known from numerous historic locations along the western study area boundary. At least one property in the study area does contain an unusual seep-supported population of Sebastopol meadowfoam, immediately west of the Laguna at (north of) Llano Road.

2.3 Species of Concern

Numerous plant and animal species throughout the state and region have been depleted so greatly through loss of habitat that various local, state, and federal agencies and private organizations have recognized them as either candidates for protection or have listed them as rare, threatened, or endangered. On the Santa Rosa Plain, three plants have become so recognized and protected at the federal level under the Endangered Species Act, and one amphibian, the California tiger salamander has been proposed for listing. The listed species are afforded legal status and are to be fully considered (subject to a Section 7 consultation with the Service) and protected when the Corps permits an action under the Clean Water Act. These and other species are also recognized by state policies, CEQA, regional CNPS guidelines, City and County planning policies. For the purposes of this study, plants on any of the current or recent CNPS lists (1A through 4) were considered as potentially sensitive. While many native vernal pool plants are still regarded as common and are not specifically recognized or listed, as part of a greatly depleted plant community virtually all native pool taxa have declined and warrant some consideration. CNPS List 4 plants alone are not necessarily enough of a legal constraint to prevent or significantly alter a proposed project or change in land use, but multiple occurrences and the combination with jurisdictional wetlands can often require mitigation. In general, the occurrence together of several native pool species indicates the presence of potential vernal pool habitat and the possibility of sensitive species.

Detailed seasonal surveys for sensitive species are now routinely required in the study area, with two separate years of negative findings often required to conclusively demonstrate absence. Spring is when the species of greatest concern are evident and identifiable, typically April and May. However, annual weather patterns and individual species' characteristics dictate that in order to cover all species of potential concern, a full season of investigation should begin by late February and, in most years, continue until at least early June.

2.3.1 Plant Species of Primary Concern

There are more than 50 sensitive plant taxa that are known or expected within the region immediately surrounding the study area; approximately the overall area shown on Figure 2. There are three plants believed to be extinct in the region: Pitkin Marsh paintbrush (*Castilleja uliginosa*), showy Indian clover (*Trifolium amoenum*), and Petaluma popcornflower (*Plagiobothrys mollis* var. *vestitus*). There are about 30 taxa that are of high concern (CNPS List 1b) and are potentially protected under CEQA, and an additional dozen or more which are of lower CNPS listing (lists 2, 3, or 4). About 10 species are documented as still occurring in the study area's wetlands. Table 2 presents the master list of regionally possible rare plants, and Table 3 summarizes the sensitive species known to occur here.

While there are a number of sensitive species that have declined in this region and others that are dependent on dwindling habitats, there are three plants that are listed and protected under both state and federal laws. These are Sebastopol meadowfoam (*Limnanthes vinculans*), Burke's goldfields (*Lasthenia burkei*), and Baker's blennosperma (*Blennosperma bakeri*). All three are small winter/spring annuals dependent upon seasonal wetlands. All are largely endemic to the Plain.

Table 2. Sensitive plants potentially in the greater Santa Rosa r gion

PLANT TAXON	COMMON NAME	LIST	R-E-D	FWS	CDFG	HABITAT
SPECIES OF PRIMARY CONCERN:						
Castilleja uliginosa	Pitkin Marsh paintbrush	1a	PE 1987	C2	E	marshes, wet meadow; Pitkin Marsh
Plagiobothrys mollis var. vestitus	Petaluma popcorn flower	1a	PE 1888	C2	-	valley flats, vernal pools ?
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	1b	3-3-3	C2	-	low wet places, marsh, riparian scrub
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	1b	3-3-3	C3c	R	dry serp., near Occidental
Arctostaphylos canescens var. sonomensis	Sonoma manzanita	1b	2-2-3	-	-	chaparral
Arct staphylos densiflora	Vine Hill or Sonoma manzanita	1b	3-3-3	C2	E	dry slopes, chaparral, roadside
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	1b	3-3-3	-	-	chaparral, edge of woodland
Astragalus clarianus	Clara Hunt's milkvetch	1b	3-3-3	C1	T	grassy hillsides, cismontane woodland
Blennosperma bakeri	Baker's blennosperma	1b	2-3-3	E	E	low wet places; valley grassland, vernal pools
Campanula californica	swamp harebell	1b	1-2-3	C2	-	freshwater marshes, bogs, closed cone pine, wet meadow,
Carex albida	white sedge	1b	3-3-3	C1	E	open marshy places; Pitkin Marsh
Ceanothus confusus	Rincon Ridge ceanothus	1b	3-3-3	C2	-	foothill woodland, chaparral
Ceanothus divergens	Calistoga ceanothus	1b	3-2-3	C2	-	chaparral, woodland; serpentine
Ceanothus foliosus var. vineatus	Vine Hill ceanothus	1b	3-3-3	C2	-	chaparral
Ceanothus sonomensis	Sonoma ceanothus	1b	3-2-3	C2	-	chaparral, Hood Mountain region
Clarkia imbricata	Vine Hill clarkia	1b	3-3-3	C1	E	chaparral near Pitkin Marsh
Cordylanthus tenuis ssp. capillaris	Pennel's bird's-beak	1b	3-2-3	PE	R	dry open places

Table 2. Sensitive plants potentially in the gr ater Santa Rosa region

PLANT TAXON	COMMON NAME	LIST	R-E-D	FWS	CDFG	HABITAT
Delphinium bakeri	Baker's larkspur	1b	3-3-3	C1	R	low brush and fencerows; coast'l prairie
Delphinium luteum	yellow larkspur	1b	3-3-3	C1	R	sea bluffs, coastal scrub
Fritillaria liliacea	fragrant fritillary	1b	1-2-3	C2	-	heavy adobe soils, coastal grassland and scrub
Gratiola heterosepala	Bogg's Lake hedge-hyssop	1b	1-2-2	C3c	E	vernal pools, shallow marshy ground
Lasthenia burkei	Burke's goldfields	1b	3-3-3	E	E	vernal pools, wet swales
Legenere limosa	legenere	1b	2-3-3	C2	-	vernal pools; valley grassland
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	1b	3-3-3	C1	E	wet marshy ground, Pitkin Marsh
Limnanthes vinculans	Cunningham Marsh or Sebastopol meadowfoam	1b	2-3-3	E	E	vernal pools, wet meadows
Navarr tia leucocephala ssp. bakeri	Baker's navarretia	1b	2-2-3	-	-	vernal pools, wet swales, mesic grassland?
Navarretia leucocephala ssp. plieantha	many- flowered navarretia	1b	3-2-3	C1	E	edges of vernal pools, meadows
Penstemon newberryi var. sonomensis	Sonoma beard tongue	1b	3-1-3	-	-	rocky chaparral
Pleuropogon hooverianus	Hoover's semaphore grass	1b	3-2-3	C2	R	meadows, coastal decid. forest, wet places
Rhynchospora californica	California beaked rush	1b	3-3-3	C2	-	bogs, swamps, freshwater marsh
Sidalcea oregana ssp. valida	Kenwood Marsh checker mallow	1b	3-3-3	C1	E	freshwater marsh
Trifolium amoenum	showy Indian clover	1b	3-3-3	C2*	-	low rich fields, swales; serpentine
SPECIES OF SECONDARY CONCERN:						
Carex californica	California sedge	2	3-1-1	-	-	coastal flats and prairie
Downingia pusilla	dwarf downingia	2	1-2-1	C3c	-	vernal pools; valley grassland

Table 2. Sensitive plants potentially in the greater Santa Rosa region

PLANT TAXON	COMMON NAME	LIST	R-E-D	FWS	CDFG	HABITAT
Rhynchospora globularis var. globularis	round headed beaked rush	2	3-3-1	-	-	bogs, freshwater marsh
Hemizonia congesta ssp. leucocephala	hayfield tarplant	3	?-?-3	-	-	coastal scrub, prairie, grassland
Pogogyne douglasii ssp. parviflora	Douglas' pogogyne	3	1-2-3	C3c	-	vernal pools, low seas. wet places
Astragalus breweri	Brewer's milkvetch	4	1-2-3	-	-	chaparral, woodland, grassland
Elymus californica (Hystrix c.)	California bottlebrush grass	4	1-1-3	C3c	-	coastal, shaded woods and forest
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	4	1-2-3	C2	-	moist places, marshes, woodland
Ranunculus lobbii	Lobb's aquatic buttercup	4	1-2-3	-	-	shallow vernal ponds & pools
Rhynchospora alba	white beaked rush	4	1-1-1	-	-	bogs, freshwater marsh
Ribes victoris	Victor's gooseberry	4	1-1-3	-	-	broadleaved up. forest, chaparral
Cuscuta howelliana	Bogg's Lake dodder		dropped	-	-	vernal pools
Hemizonia multicaulis ssp. vernalis	Tiburon tarplant		dropped	-	-	coastal scrub prairie; serpentine
Potentilla hickmanii var. uliginosa	Cunningham Marsh cinquefoil		dropped	-	-	freshwater marsh
Quercus lobata	valley oak		dropped	-	-	foot. & valley woodland, riparian
Ribes divaricatum var. publiflorum	straggly gooseberry		dropped	-	-	broadleaved up. forest, No. Coast forest
Trifolium grayi	Gray's clover		dropped	-	-	meadows, mesic grassland

LEGEND FOR TABLE 2

Plant Taxon: as listed by Skinner, M.W., and B. M. Pavlik, Ed.s (1994).

List: Refers to the list number on which the plant is included in Skinner and Pavlik, Ed.s (1994): California Native Plant Society's sensitive plant inventory. **1a**: Plants presumed extinct, **1b**: Plants rare or endangered in California and elsewhere, **2**: Plants rare or endangered in California, but more common elsewhere, **3**: Plants about which we need more information, and **4:** Plants of limited distribution [a watch list]. Appendix 1: plants considered, but not included.

R-E-D: rarity (R), endangerment (E), and distribution (D) code from Skinner, M.W., Ed. (1994) :

Rarity :

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several or one extended population(s).
3 = Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom seen.
PE = Presumed extinct in California (with date last seen)

Endangerment :

1 = Not endangered.
2 = Endangered in a portion of its range.
3 = Endangered throughout its range.

Distribution :

1 = More or less widespread outside California.
2 = Rare outside California.
3 = Endemic to California.

FWS: C1 = A candidate taxon, Category 1: information sufficient for federal listing by FWS (1985). C2 = Also a candidate, Category 2: information insufficient for formal proposal for listing. C3c = Previously considered, but currently considered to be too common for listing. * = presumed extinct.

CDFG: E = Endangered, R = Rare, T = Threatened; as designated by CDFG (1992).

Habitat, Elevation, Flowering Period: As reported in Munz and Keck (1959), Munz (1968), Skinner, M.W., Ed. (1994), Hickman, J.C., Ed. 1993, and/or Abrams and Ferris (1923 - 1951).

Table 3. Summary of sensitive plants known or historically reported on the Santa Rosa Plain

Plant Species	Status	Habitat	General Distribution	No. Hist. Sites in Study Area	No. of Sites Extir-pated	Sites Severely Degraded	No. of Sites Preserved	Acres Preserved	Rough Population Estimat	High Quality/ Priority Sites in Study Area	Sites Known Outside Study Area
SPECIES OF PRIMARY CONCERN:											
Biennosperma bakeri	Fed: E Calif: E CNPS: 1b	low wet places; valley grassland, vernal pools	southern Santa Rosa Plain; west to laguna; north to Fulton	53	9 +	12+	6 + ?	~ 120 (+150? in ease.?)	900,000 +	26B10, 11, 20? 26?, 27?, 30, 32, 34, 35, 37, 40, 58; 26F06	~ 4
Lasthenia burkei	Fed: E Calif: E CNPS: 1b	vernal pools, wet swales	Windsor to Laguna; south to SW Santa Rosa;	85	20 +	18+	15	~ 65	600,000 - 800,000	20C01, 7, 8; 20F05, 7, 8; 26B22, 33, 38, 40, 43, 44, 51	~ 4
Limnanthes vinculans	Fed: E Calif: E CNPS: 1b	vernal pools, wet meadows	Cotati to Laguna; north to Hall road	49	9 +	5 +	8 + ?	~ 170 (+ ease-ments ?)	700,000 + +	26D03, 4, 6; 26F01, 2, 4, 6, 12?, 17, 23, 26? 34; 32B01	~ 6
Navarretia leucocephala ssp. bakeri	CNPS: 1b	vernal pools, wet swales, mesic grassland?	unknown; scattered throughout? known at least in Windsor, western Santa Rosa	10 +	2 + ?		1+? (Alton Ln)	2 +	< 10,000 ?		yes
Navarretia leucocephala ssp. plieantha	Fed: C1 Calif: E CNPS: 1b	edges of vernal pools, meadows	only known from Sanders Road area, between Fulton & Windsor	2	?		0	0 ?	< 500 ?	20F 07, 08	yes
Pleuropogon hooverianus	Fed: C2 Calif: R CNPS: 1b	meadows, coastal decid. forest, wet places	not confirmed in study area; hist. report possibly erroneous	0 ?	?		0	0	0 ?		yes
Trifolium amoenum	Fed: C2 Calif: - CNPS: 1b	low rich fields, swales; serpentine	historically reported from "Santa Rosa"; no known sites	1 +	1 + ?		0	0	0 ?		yes (1)
SPECIES OF SECONDARY CONCERN:											
Downingia pusilla	CNPS: 2	vernal pools; valley grassland	scattered throughout	10 +	2 + +		3 + ?	~ 50 ?	50,000 - 200,000 ?		y s ++

Source: Patterson, Guggolz, and Waaland (Attachment 1), 1994

Table 3. Summary of sensitive plants known or historically reported on the Santa Rosa Plain

Plant Species	Status	Habitat	General Distribution	No. Hist. Sites in Study Area	No. of Sites Extir-pated	Sites Severely Degraded	No. of Sites Preserved	Acres Preserved	Rough Population Estimate	High Quality/ Priority Sites in Study Area	Sites Known Outside Study Area
Hemizonia congesta ssp. leucocephala	CNPS: 3	coastal scrub, prairie, grassland	scattered throughout	4 +	2 + ?		0 ?	?	?		yes
Pogogyne douglasii ssp. parviflora	CNPS: 3	vernal pools, low seas. wet places	scattered throughout	2 6	3 + +		7	100 +?	?		yes +
Perideridia gairdneri ssp. gairdneri	FED: C2 CNPS: 4	moist places, marshes, woodland	only two confirmed sites; Windsor and Todd Road	2 ?	?		1	75 ?	< 500 ?		yes +
Ranunculus lobbii	CNPS: 4	shallow vernal ponds & pools	scattered throughout	4 9 +	5 +		1 0	100 +?	?		y s +
Cuscuta howelliana	None	vernal pools	historically in Windsor	1 +	1 + ?		0		?		y s +
Hemizonia multicaulis ssp. vernalis (no longer valid)	None	coastal scrub prairie; serpentine	southern Santa Rosa Plain	1 +	?		?		?		yes +
Quercus lobata	None	foot. & valley woodland, riparian	scattered throughout	2 0 + +	?		5 +	?	?		yes +++
Trifolium barbigerum var. andrewsii (= T. grayi)	None	meadows, mesic grassland	general Windsor area	1 0 +	?		?		?		yes +

Source: Patterson, Guggolz, and Waaland (Attachment 1), 1994

Figures 6, 7, and 8 show the known locations and general distributions of these three primary species of concern in and around the study area. Additional descriptions of these species are presented in Appendix B, and site locations and rough population data are included in Attachment 1 (summary chart). Most of the plants on CNPS Lists 1a and 1b are regarded as rare, and generally require planning consideration under CEQA. Wetland fill actions that would affect any of the three federally listed species also requires full review and permitting by the Corps and "Section 7" consultation with the Service. Projects that will result in unavoidable impacts to these species require special permitting conditions and mitigation, including habitat value replacement, detailed monitoring, and attainment of specific success criteria.

2.3.2 Plant Species of Secondary Concern

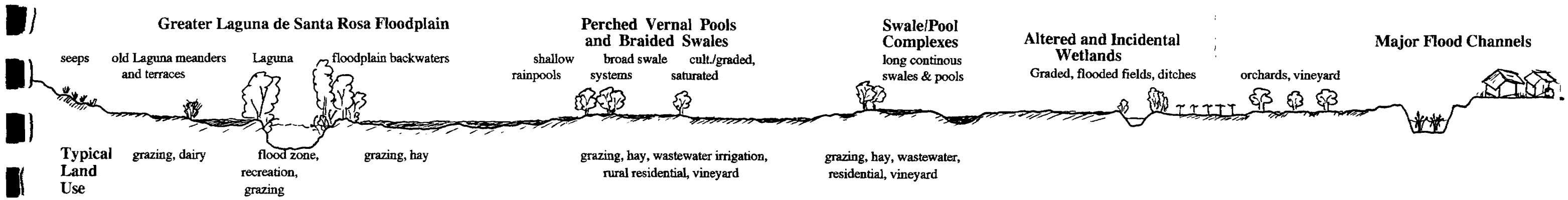
There are more than 40 plants of secondary concern known or expected in the study area, ranging from several on CNPS' List 1b, to native oaks and riparian trees which may be protected locally or under CEQA, but are not necessarily on formal lists. Some, such as Lobb's aquatic buttercup (*Ranunculus lobbii*), are restricted to vernal pools, but are relatively well distributed and can be locally abundant. Others, including Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*) and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*) are quite scarce in the study area, while Douglas' pogogyne (*Pogogyne douglasii* ssp. *parviflora*), dwarf downingia (*Downingia pusilla*), and Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) are more common (C. Patterson, unpubl. field data). All of these species are also restricted to seasonal wetlands. There are also several uncommon plants that grow in upland habitats on the Plain, including hayfield tarplant, the inland form of Tiburon tarplant, Gray's clover, and historically, showy Indian clover. This last plant was previously believed to be extinct, but was recently rediscovered at one location near the coast.

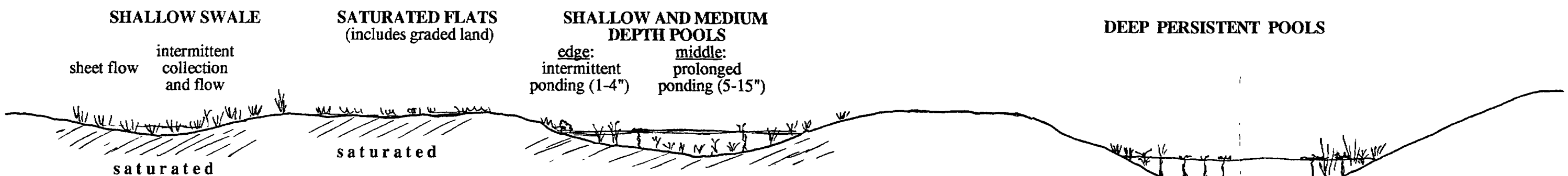
While Table 2 lists numerous sensitive plants from the general central Sonoma County region, it includes many (e.g., manzanitas and ceanothus) that are restricted to rocky (chaparral) soils and/or foothill environments (or serpentine, outcrops, barrens) which are essentially absent from the Santa Rosa Plain study area. Others are known from near the Plain, such as at the Kenwood Marsh (*Sidalcea oregana* ssp. *valida*) and around Sebastopol, while a few on the list are more widespread species that could possibly find suitable habitat here (e.g., *Legenere, Fritillaria, Campanula, Rhynchospora, Gratiola heterosepala*).

2.3.3 Wildlife Species of Concern

Threatened and endangered animals known or expected to occur in the study area are listed in Table 4. The California yellow-billed cuckoo is a state and federally listed bird associated with mature riparian forest. It historically inhabited the Laguna in the past, but was last observed in the 1950's before channelization eliminated most of its habitat. Re-establishment of the yellow-billed cuckoo would be dependent on restoration of large expanses of riparian forest. The bald eagle and peregrine falcon, state and federally listed species, are occasionally present in the Laguna (Bolander in De Mars et al., 1977). Other birds of special concern (on a DFG watch list) known to use the study area include the northern harrier (marsh hawk), burrowing owl, and black shouldered kite (Remsen, 1978).

The California freshwater shrimp (*Syncaris pacificus*) is a state and federally listed aquatic invertebrate species. It is currently found in Blucher Creek and several other tributaries of the Laguna. The freshwater shrimp was found in Santa Rosa Creek until 1960, when the creek was channelized. The Laguna de Santa Rosa is the type location for the freshwater shrimp which was first described in 1895. It was last found in the Laguna prior to 1950 (Cox, pers. comm.), and still has the potential to occur there.





SHALLOW SWALE

Non-native:
- Hordeum hystrix
- Lythrum hyssopifolia
- Lolium multiflorum
- Geranium dissectum
- Vulpia, Phalaris, Rumex

Native:
- Danthonia californicus
- Hordeum brachyantherum
- Juncus phaeocephalus
- Brodiaea elegans
- Triteliaea peduncularis
- Calochortus unifolius
- Sisyrinchium bellum
- Orthocarpus faucibarbatus
- Hemizonia spp.

SATURATED FLATS

Non-native:
- Lolium multiflorum
- Hordeum hystrix
- Geranium dissectum
- Juncus bufonius
- Vulpia, Phalaris, Rumex

Native:
- Danthonia californicus
- Brodiaea elegans
- Orthocarpus faucibarbatus
- Sisyrinchium bellum
- Juncus mexicanus
- Elymus triticoides
- Limnanthes douglasii nivea

SHALLOW AND MEDIUM DEPTH POOLS

Non-native:
- Lolium multiflorum
- Hordeum hystrix
- Polypogon monspeliensis
- Polygonum aviculare
- Rumex, Mentha, Phalaris

Native:
- Lasthenia spp.
- Gratiola ebracteata
- Downingia concolor
- Plagiobothrys spp.
- Juncus spp.
- Deschampsia danthonioides
- Limnanthes spp.

Non-native:
- Mentha pulegium
- Rumex crispus
- Xanthium spp.
- Cyperus eragrositis

Native:
- Plagiobothrys spp.
- Lasthenia spp.
- Pleuropogon calif.
- Gratiola ebracteata
- Limnanthes spp.
- Downingia spp.
- Juncus phaeocephalus
- Callitriche, Eleocharis
- Ranunculus spp.

DEEP PERSISTENT POOLS

Non-native:
- Xanthium
- Polygonum

Native:
- Callitriche
- Eleocharis, Lilaea
- Glyceria occidentalis
- Ranunculus lobbii
- Elodea, Rorippa
- Potamogeton
- Eryngium

Typical clay loam cross-section:

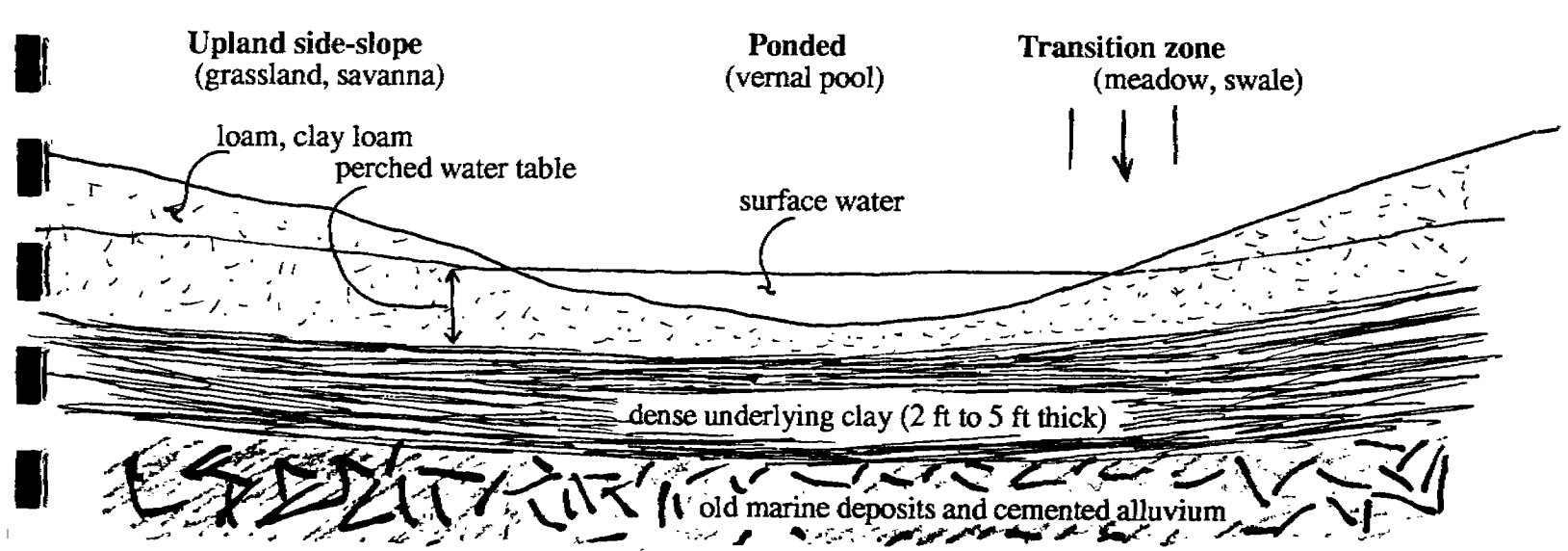


FIGURE 5
Generalized cross-sections of seasonal wetlands

no scale | Sonoma County

Prepared by: C. Patterson, 6/30/94

SANTA ROSA PLAIN WETLAND BASELINE STUDY

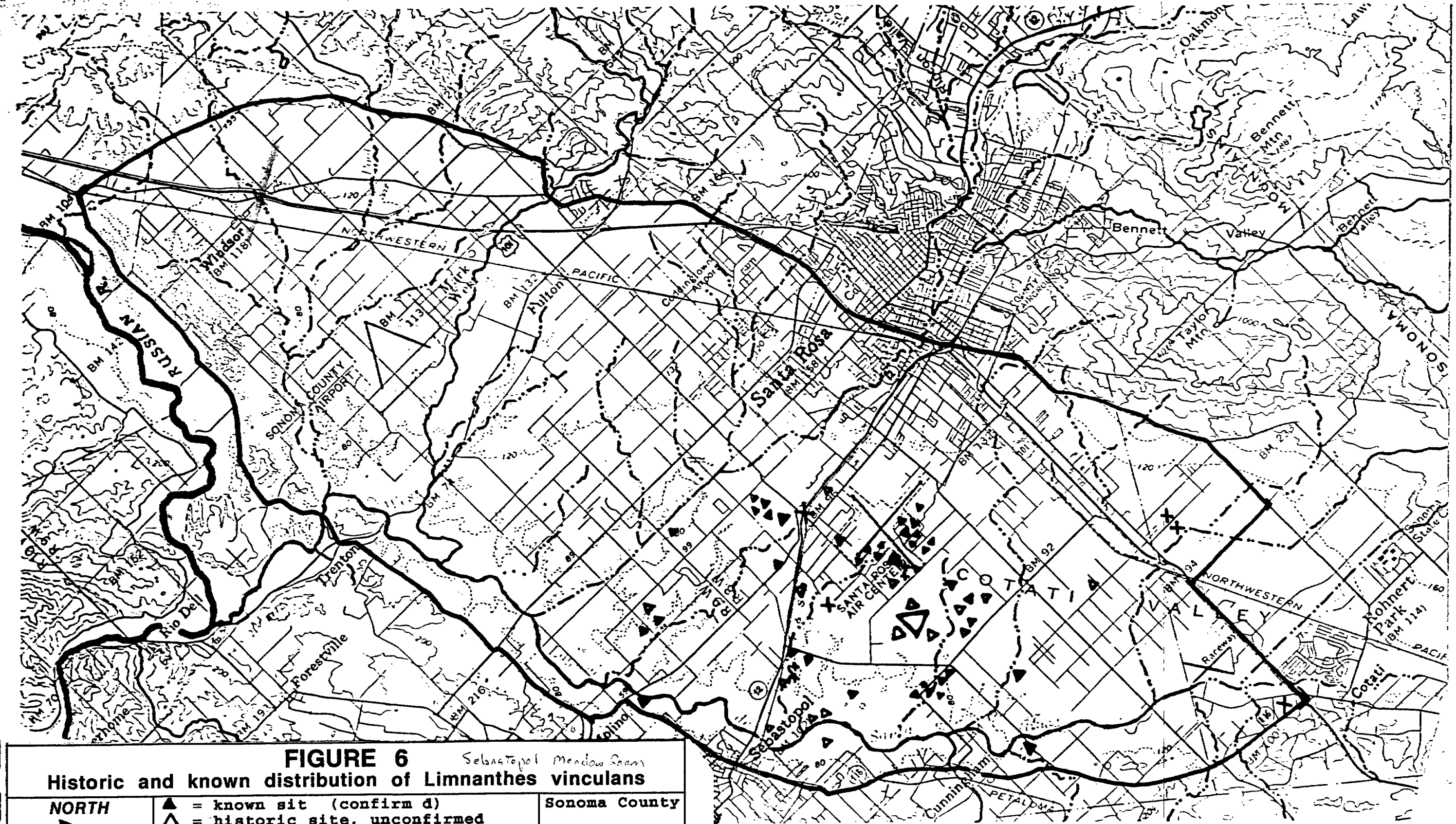


FIGURE 6 Sebastopol Meadow foam

Historic and known distribution of Limnanthes vinculans

NORTH ↖	▲ = known sit (confirm d) △ = historic site, unconfirmed x = historic site, extirpated	Sonoma County
	Prepared by: C. Patterson, 6/30/94	

SANTA ROSA PLAIN WETLAND BASELINE STUDY

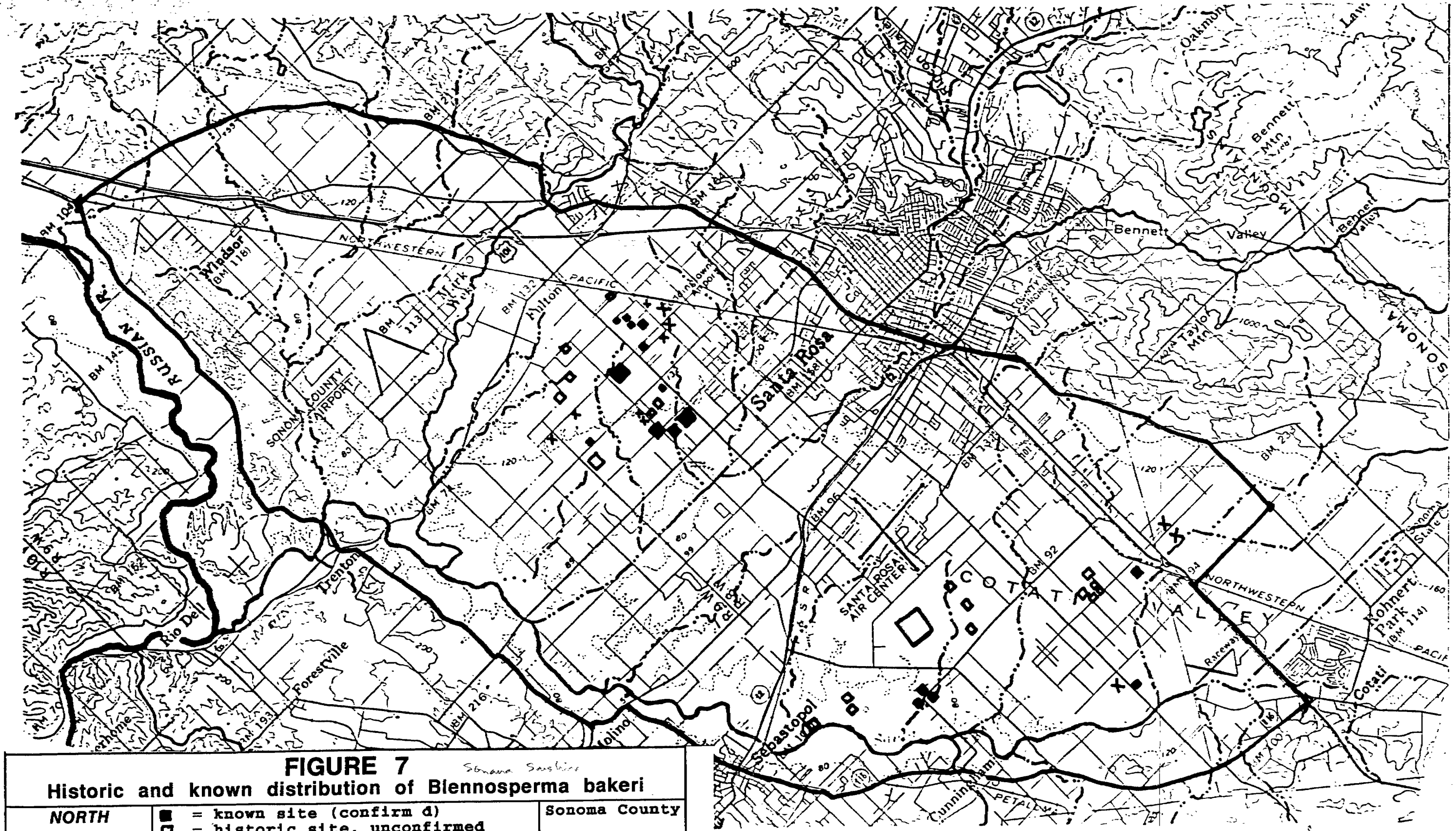


FIGURE 7

Historic and known distribution of Blennosperma bakeri

NORTH	■ = known site (confirm d) □ = historic site, unconfirmed X = historic site, extirpated	Sonoma County
↖	Prepared by: C. Patterson, 6/30/94	

SANTA ROSA PLAIN WETLAND BASELINE STUDY

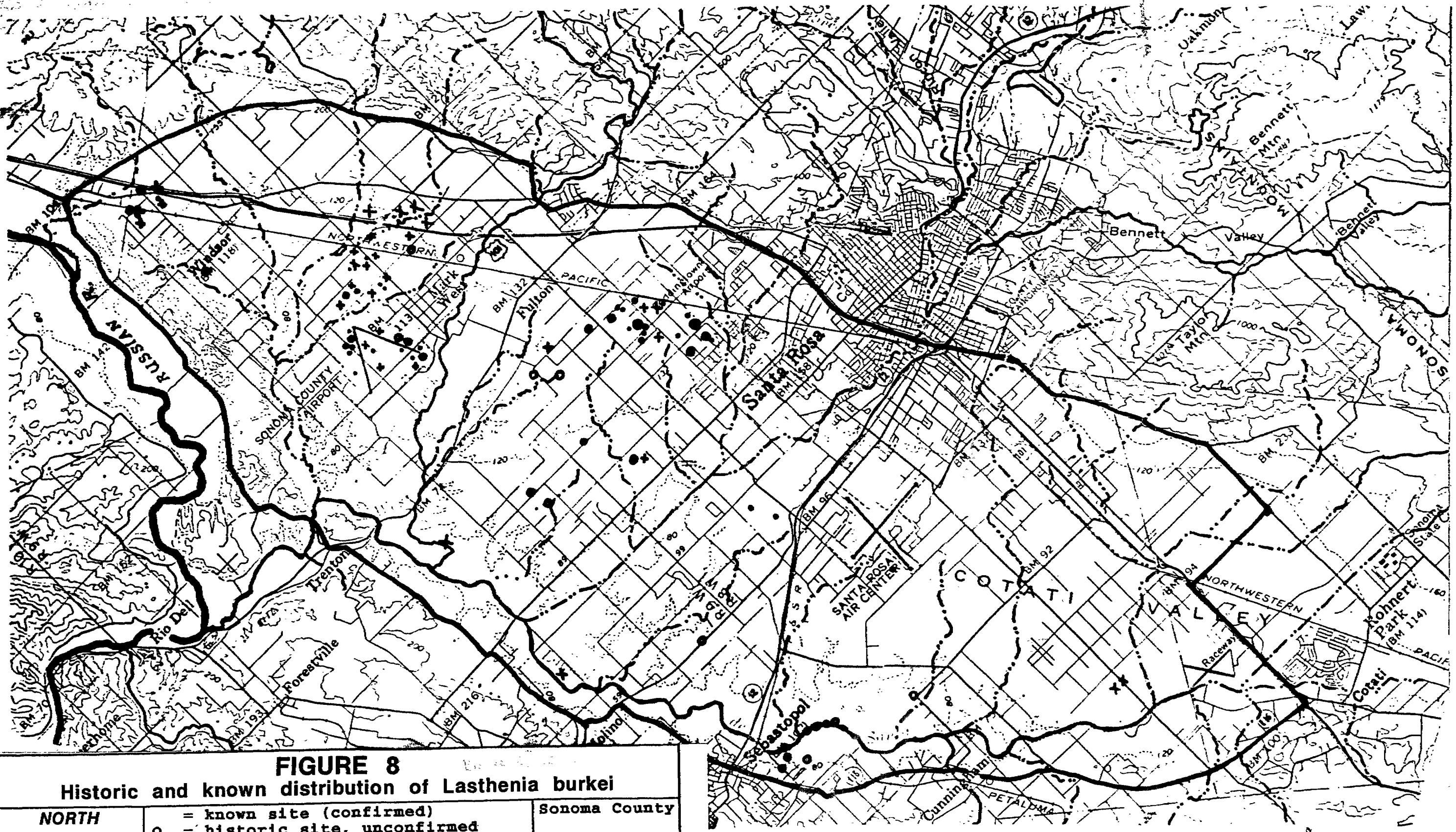


FIGURE 8

Historic and known distribution of Lasthenia burkei

NORTH ↖	= known site (confirmed) o = historic site, unconfirmed x = historic sit , xtirpated	Sonoma County
	Prepared by: C. Patterson, 6/30/94	

SANTA ROSA PLAIN WETLAND BASELINE STUDY

Plate 5. Sebastopol meadowfoam (*Limnanthes vinculans*)

Plate 6. Baker's blennosperma (*Blennosperma bakeri*)

Plate 7. Burke's goldfields (*Lasthenia burkei*)

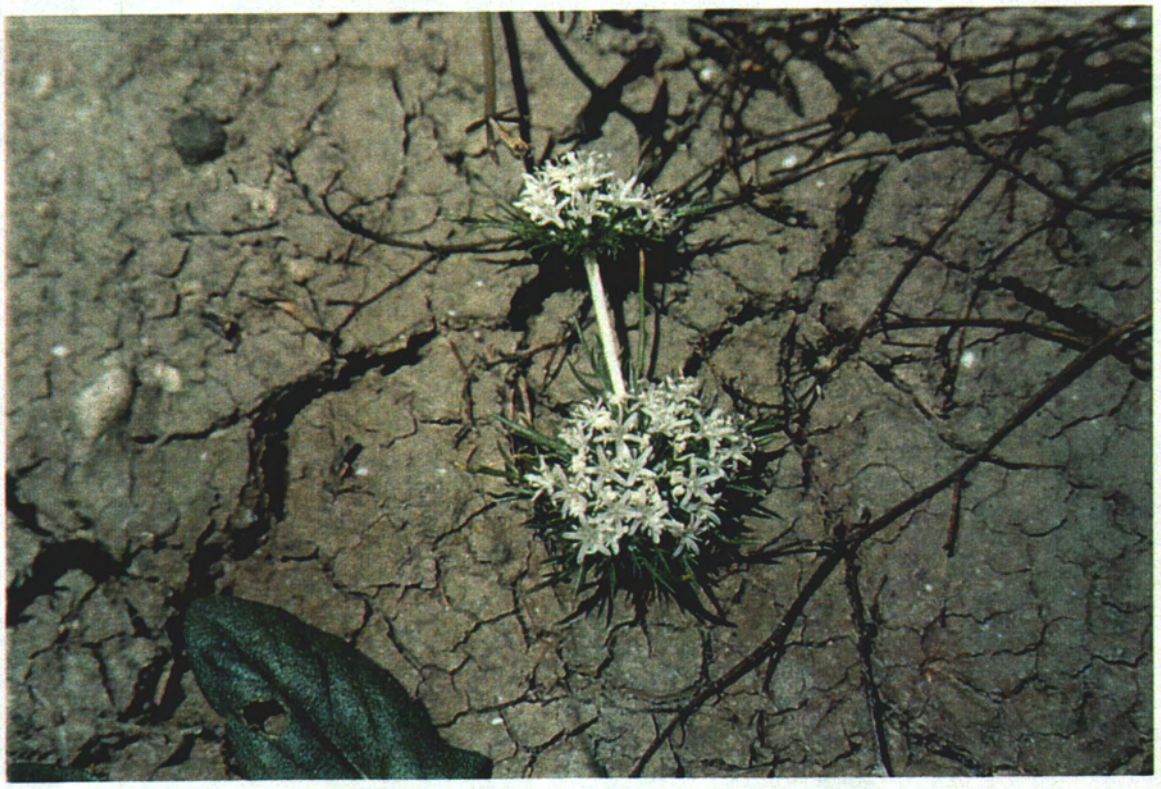


Plate 8. Many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*)

At least two aquatic wildlife species that have recently been proposed for federal listing and protection are known to occur in the study area. These are the California tiger salamander (*Ambystoma californiense*) and California linderiella (*Linderiella occidentalis*). The tiger salamander breeds in vernal pools and retreats into subterranean burrows in the nearby grassland during summer. The larvae hatch and grow in the seasonal pools, typically in the deeper features and those that stay ponded for more than about three months, but occasionally in small pools that are less than 15 inches deep. The local genetic representation of this species is apparently relatively distinct (Shaffer, 1992), although Shaffer also reports that non-native tiger salamanders appear to be present in this region as well. At least 10 locations for this rare amphibian are known in the study area (FEMA, Broadmoor north, Air Center north, Finley at Wright, "Madera", "Springfield", "Cramer", Ludwig ditch, south of Ludwig and Wright, "Harotounian" on Scenic), although there is substantial additional potentially suitable habitat present that has not been surveyed. Tiger salamanders are threatened in the region by continued wetland losses, discing of upland refuge/burrow areas, and probable predation on larvae by mosquito fish and crayfish.

California linderiella is a diminutive (about one-half an inch long) aquatic invertebrate, a fairy shrimp, that lives in seasonal pools and slow waters. It typically hatches in early winter (November/December) from dormant eggs laid in the previous year's pools, and thrives in the colder early season water. In a wet year, it may go through more than one reproductive cycle, but generally by April, warmer temperatures and receding water triggers final egg production and dormancy until the next winter. The early season maturation of this species apparently minimizes the depredation by other aquatic species which mature later in the season. California linderiella has been found on at least six sites in the study area and could occur in many other pools. The natural seasonal wetlands of the Santa Rosa Plain appear to have included extensive suitable habitat for this species, i.e., shallow vernal pools and deeper swales, but extensive discing, manure input, exotic grass growth and thatch accumulation have rendered most unsuitable. At the time of writing this report, California linderiella had just been dropped from consideration for federal listing.

Other wildlife species of concern on the Plain include numerous wetland dependent birds and raptors (both residents and migrants), plus several reptiles (western pond turtle) and amphibians (red-legged frog, spadefoot toad) which could occur in the region, but which have not been well-documented here to date. Most of these species require more permanent water, however, unlike the conditions found in vernal pools. Detailed surveys for either common or sensitive wildlife species have generally not been conducted until recent years, and current regulatory requirements and accepted survey protocols have not been formally specified.

2.4 Historic Botanical Investigations

2.4.1 Early Botanical Work

Sonoma County's rich botanical diversity encouraged botanists from many countries to collect specimens of the native flora. Archibald Menzies arrived from Scotland in 1792. John M. Bigelow collected in Santa Rosa in 1854 and William H. Brewer in Santa Rosa, Sonoma, and Petaluma in 1862. Among Bigelow's collections is *Carex albida* at the type locality near Santa Rosa Creek. From 1880 to 1896, Joseph Congdon collected a number of wetland species on or near the Santa Rosa Plain, including *Alopecurus aequalis* var. *sonomensis* at Bloomfield Marsh, *Triteleia peduncularis* near Santa Rosa, and *Camassia quamash* near Sebastopol. In 1902, *Downingia concolor* was collected by Amos A. Heller and H. F. Brown near Santa Rosa. Alice Eastwood of the California Academy of Sciences collected frequently with J. T. Howell in this area. Included in their 1936 collections was *Pogogyne douglasii* ssp. *parviflora*, collected two miles north of Windsor. Milo S. Baker, curator of the herbarium at the Santa Rosa Junior College from 1922 to 1961, made many collections in Sonoma County. Frequently accompanied by John Howell, he enriched his large collection of specimens, many of them collected in the Vine Hill Region, Hood Mountain, Rincon Valley, and the Santa Rosa Plain. Although he located *Blennosperma bakeri* in Sonoma in 1946, he apparently was unaware of the species' western extension into the Cotati Valley (Santa Rosa Plain).

Table 4. Sensitive wildlife species potentially in the Santa Rosa Plain region

Wildlife Species	Status	Habitat	Likely In Study Area ?
BIRDS			
Accipiter cooperi . (Cooper's hawk)	CA: csc; FED: -	heavily wooded areas along streams or near springs	occasional foraging in wooded areas
Accipiter gentilis . (northern goshawk)	CA: csc; FED: C2	middle and high elevation forests	rare foraging or passing through
Accipiter striatus . (sharp-shinned hawk)	CA: csc; FED: -	heavily wooded areas along streams or near springs	occasional foraging in wooded areas
Agelaius tricolor . (tricolored blackbird)	CA: csc; FED: C2	nests in cattails, blackberry etc. near perennial streams and/or marshes	unknown; suitable habitat present along the Laguna
Aix sponsa . (wood duck)	CA: -; FED: -	slow moving rivers and streams with riparian thicket or woodland	unknown; suitable habitat present along the Laguna
Aquila chrysaetos . (golden eagle)	CA: csc; FED: -	nests in tall trees with views or on cliffs; forages in open grasslands, etc.	occasional foraging in open areas; possible nesting
Ardea herodias . (Great blue heron)	CA: -; FED: -	major wetlands, sloughs, creeks, shallow lakes, ditches	Yes; suitable habitat present along the Laguna
Asio flammeus . (short-eared owl)	CA: csc; FED: -	fresh, brackish, and saltwater marshes, lowland meadows, grassland	unknown; suitable habitat present along the Laguna
Asio otus . (long-eared owl)	CA: csc; FED: -	hunts in open grasslands, meadows, fields; nests in thickets and woodlands	unknown; may be suitable foraging habitat
Casmerodius albus . (Great egret)	CA: -; FED: -	major wetlands, sloughs, creeks, shallow lakes, ditches	unknown; suitable habitat present along the Laguna
Circus cyaneus . (Northern harrier)	CA: csc; FED: -	meadows, marshes, grasslands, open fields	Yes; extensive suitable habitat; frequent in open fields, near wetlands
Coccyzus americanus . (yellow-billed cuckoo)	CA: E; FED: -	riparian woodland and forest in major valleys, along major rivers	No; historic, but no suitable large habitat patches remain
Dendroica petechia . (yellow warbler)	CA: csc; FED: -	riparian woodlands	unknown; suitable habitat present along the Laguna
Egretta thula . (snowy egret)	CA:-; FED: -	nests in groves of trees near wetlands with fish and/or suitable food base	unknown; suitable habitat present along the Laguna
Elanus caeruleus . (Black-shouldered kite)	CA: FP; FED: -	meadows, marshes, grasslands, open fields	occasional; extensive suitable habitat
Falco columbarius . (merlin)	CA: csc; FED: -	winter migrant; forages in grasslands, wetlands, etc.	unknown; suitable habitat present
Falco mexicanus . (prairie falcon)	CA: csc; FED: -	nests on cliffs; forages in open country	occasional passing through, foraging

Table 4. Sensitive wildlife species potentially in the Santa Rosa Plain region

Wildlife Species	Status	Habitat	Likely In Study Area ?
Falco peregrinus anatum . (American peregrine falcon)	CA: E ; FED: E	nests on cliffs near permanent water	unknown; not much habitat
Haliaeetus leucocephalus . (bald eagle)	CA: E; FED: E	nests in large trees or snags near permanent water; needs fish for foraging/residency	occasional migrant?
Icteria virens . (yellow-breasted chat)	CA: -; FED: -	dense riparian thickets, scrub	unknown; suitable habitat present
Nycticorax nycticorax . (black-crowned night heron)	CA: -; FED: -	feeds in marshes; nests in riparian scrub to forest	unknown; suitable habitat present
Pandion haliaetus . (osprey)	CA: csc; FED: -	nests on snags, poles, towers, very tall trees; near permanent water with fish	occasional migrant?
Progne subis . (purple martin)	CA: csc; FED: -	nests in holes in snags, stumps, near permanent waters with insects	unknown; suitable habitat present
Speotyto cunicularia . (Burrowing owl)	CA: csc; FED: -	creekbanks, low hills, grasslands	unknown; suitable habitat present
MAMMALS			
Bassariscus astutus . (ringtail cat)	CA: FP; FED: -	riparian scrubs, woodland; typically near permanent water	unknown
Plecotus townsendii townsendii . (Townsend's western big-eared bat)	CA: csc; FED: C2	many habitats; needs caves, mines, or old buildings for roosting	unknown
Taxidea taxus . (American badger)	CA: csc; FED: -	oak savanna, grassland	Yes; some open habitat, but few undisturbed burrow sites
REPTILES AND AMPHIBIANS			
Ambystoma californiense . (California tiger salamander)	CA: csc; FED: FPE	vernal pools, seasonal ponds, isolated ponds & small lakes	Yes; scattered sites in seasonal wetlands, ponds
Clemmys marmorata pallida . (western pond turtle)	CA: csc; FED: C2	ponds and perennial streams	unknown; suitable habitat along the Laguna
Rana aurora draytonii . (California red-legged frog)	CA: csc; FED: PFE	perennial streams	unknown; possibly suitable habitat along the Laguna
Rana boylei . (foothill yellow-legged frog)	CA: csc; FED: C2	creeks, streams in woodland, chaparral	unknown; possibly suitable habitat along the Laguna
INVERTEBRATES			
Branchinecta lynchi . (vernal pool fairy shrimp)	CA: -; FED: FPE	vernal pools, seasonal waters	unknown; none documented to date; habitat present

Table 4. Sensitive wildlife species potentially in the Santa Rosa Plain region

Wildlife Species	Status	Habitat	Likely In Study Area ?
Danaus plexippus . (Monarch butterfly)	CA: -; FED: -	tree groves, occasionally in eucalyptus	occasional
Ischnura gemina . (S. F. forktailed damselfly	CA: csc; FED: C2	slow moving freshwater with dense vegetation, often near brackish marshes	unknown; none documented to date; habitat present
Lepidurus packardii . (vernal pool tadpole shrimp)	CA: -; FED: FPE	vernal pools, seasonal waters	unknown; none documented to date; habitat present
Linderiella occidentalis . (California linderiella)	CA: -; FED: -	vernal pools, seasonal waters	Yes; scattered sites in seasonal wetlands
Proceratium californicum . (valley oak ant)	CA: -; FED: C2	valley oak woodland, riparian woodland	unknown; none documented to date; habitat present
Smithistruma reliquia . (ancient ant)	CA: -; FED: C2	valley oak woodland, riparian woodland	unknown; none documented to date; habitat present
Syncaris pacifica . (California freshwater shrimp)	CA: E; FED: E	cool shaded streams, natural creekbanks	Yes; in scattered natural creeks

Source: California Department of Fish and Game, 1992, List of Special Animals

CA (California status): E = Endangered, R = Rare, T = Threatened, FP = fully protected, csc = species of special concern

FED (Federal status): E = Endangered, R = Rare, T = Threatened, FPE = federally proposed C1 = Candidate, Category 1 (information sufficient to make decision on listing, may warrant listing), C2 = Candidate, Category 2 (information insufficient to make decision on listing, may or may not warrant listing)

Peter Rubtzoff, well known for his Phytogeographical Analysis of Pitkin Marsh published in 1953, had a deep interest in wetland plants and collected extensively in seasonal and perennial wetlands in the study area. It was not until the early 1970s, however, when the Russian River/Cotati Intertie was in the planning stages that native plant issues and rare plant concerns became part of the planning process. Recognizing the potential for accelerated population growth in the Santa Rosa area and its impact on native vegetation, a local chapter of the California Native Plant Society was organized in 1971/1972. In March of 1972, the group obtained its charter and began to focus public attention on the problems and issues involving native (and in particular rare and endemic) plant species.

2.4.2 Historic Accounts of the Plant Species of Concern

There are several different levels of official and unofficial status for plants in the regulatory scheme for this region. The first recognition of plant taxa as being potentially rare or endangered, here and elsewhere in the state, arose from early efforts by the California Native Plant Society (CNPS) to identify, investigate, and prioritize such species into various lists for planning and conservation purposes. From the initial published CNPS lists of 1974, the CNPS Inventory has grown into a major source of information on rare plants in California and has served as a potential candidate list for state and federal agencies. Based on the most recent edition of the CNPS inventory (Skinner and Pavlik, 1994), there are approximately 122 sensitive plant taxa known to occur in Sonoma County, about 20 of which are known or could be expected to occur on (or in close proximity to) the Santa Rosa Plain. Of these, most are known to occur in wetland habitats.

The three primary plant species of highest concern and status that occur in the study area are Sebastopol meadowfoam, Burke's goldfields, and Baker's blennosperma. Appendix B gives more detailed descriptions of these three species. The following are brief accounts of the collection histories for these plants:

Sebastopol meadowfoam (*Limnanthes vinculans* Ornduff) has been collected on the Santa Rosa Plain since 1946, but it was not described until 1969 (Ornduff, 1969). The formal description and discussion of the species' biosystematic relationships with other members of the genus were based primarily on Peter Rubtzoff's collections from 1954-1966 combined with Ornduff's field work in 1965-1966. Sebastopol meadowfoam was regarded as a Sonoma County endemic from 1969 until 1992 when a small disjunct colony of this species was discovered in Napa County.

Several populations of this species in the study area have been monitored frequently since 1974. In 1980, populations were known to occur in 17 locations on lands accessible for botanical surveys (Lovell, 1980). Continuing surveys have resulted in the discovery of additional colonies, and the current total (based on this investigation; see Attachment 1) of known Sebastopol meadowfoam locations that occur under separate land ownership is approximately 55. Hydrologically separate populations, however, number about ten. Of the 55 currently reported or known occurrences in Sonoma County, four are erroneous, ten or more are considered extirpated, at least eight are in preservation, 20 are considered extant but may not be large enough to qualify as good preserve lands, about ten are extant but threatened by development, and eight are large enough to qualify as viable preserves providing adjacent hydrology and land use are compatible. At least seven are ensemble sites, containing more than one listed species.

Baker's blennosperma (*Blennosperma bakeri* Heiser), also referred to as Baker's sticky-seed or Sonoma sunshine, was first discovered in a "hog wallow" in the town of Sonoma on April 2, 1946 and was described in 1947. Subsequently, additional colonies were located approximately four miles south of El Verano by Roderick in 1961 and Ornduff and Heckard in 1964. From 1972 to 1975 some of the Sonoma colonies were stable, but at least one was extirpated in 1977 by grading and an historic site on Arnold Drive was converted to vineyards in 1975.

Other locations of this species include a large colony discovered in 1986 north of Bonneau Road west of Arnold Drive by Jack and Betty Guggolz (the adjacent lands have since been converted to vineyard) and a small population in Sonoma Valley Regional Park by Stephen Barnhart in 1982.

Baker's blennosperma was not known on the Santa Rosa Plain until 1974 when it was discovered near Todd Road by C. Quibell, Nancy Harrison, and Betty Lovell (now Guggolz). Annual monitoring documented the stability of the population for several years. Following a change in property management coupled with several years of drought, the blennosperma abundance has declined. In 1977, as mitigation for the anticipated loss of several vernal pools in the area by the construction of the proposed Santa Rosa Regional Wastewater System, the City of Santa Rosa set aside the 75 acre area in the northwest quadrant of the intersection of Todd and Llano Roads. The parcel was subsequently sold to the California Department of Fish and Game to protect the existing populations of several rare plants, including *Blennosperma bakeri, Limnanthes vinculans, Lasthenia burkei, Pogogyne douglasii* ssp. *parviflora, Perideridia gairdneri* ssp. *gairdneri and Ranunculus lobbii. Lasthenia burkei* was last confirmed on the parcel in 1980 (C. Patterson, unpubl. field data) and may have been extirpated there. Experimental management options are currently being studied to restore the vigor of the native and rare plant species populations.

The number of historically known blennosperma populations under separate property ownerships is estimated at approximately 60, although many of these are hydrologically connected. Based on the findings of this study (see Attachment 1), it is estimated that there are less than 12 biologically separate populations remaining. Of the approximately 60 occurrences, about 26 are considered extant, ten or more are believed to be extant but are threatened with development, at least 17 have been extirpated, and seven have not been confirmed recently (B. Guggolz, pers. comm.). Of the 26 extant populations, four are in preservation and six are relatively large and contained within single parcels. Five of these latter properties are on the Plain and several are "ensemble" sites (with multiple sensitive species).

Burke's goldfields (*Lasthenia burkei* (Greene) Greene) was first described as *Baeria burkei* by Greene in 1886. Keck (1959) and Abrams and Ferris (1960) treated *B. burkei* as a synonym of *B. fremontii.* In 1966, Ornduff combined *Baeria, Crockeria* and *Lasthenia* under the genus *Lasthenia* and recognized *Lasthenia burkei* as a distinct species. This species is endemic to the North Coast Ranges of California, the type specimen collected "near Ukiah, in Mendocino County in 1866, by J.H. Burke. The type locality site has not been reconfirmed and is presumed extirpated. Two populations are known to occur in Lake County, and numerous colony locations are present on the Santa Rosa Plain. In recent genetic studies (Huntington, 1992/93), preliminary findings indicate that 3 genetic races of the species may exist: (1) the Lake County population, which exhibits variation in the number of awns on the achenes; (2) the northern Santa Rosa and Windsor populations; and (3) the robust specimens that occur on the southern Santa Rosa Plain near the Laguna de Santa Rosa.

Burke's goldfields is currently known from a single small colony north of Healdsburg, south from Windsor to the Laguna, with the southernmost known natural colony at the Todd Road Preserve. This latter population has not been reconfirmed, however, since 1987 and may be extirpated here.

Early collections by Ornduff (1960) documented a population "1.3 miles north of East Windsor on Highway 101. Rubtzoff collected the species "near the Laguna de Santa Rosa east of Graton, between Occidental and Guerneville Roads" in 1966 and again "near the Laguna de Santa Rosa northeast of Graton at the end of Piner Road" in 1969. The 1966 population was reconfirmed by Rubtzoff during a 1974 CNPS field trip, but by 1977, agricultural land use changes had eliminated both of the northern Laguna de Santa Rosa populations. In 1973, the local CNPS chapter began monitoring the Burke's goldfields populations. N. Harrison reconfirmed populations in northern Windsor in 1979. In 1984, an aerial flight by C. Patterson (confirmed by subsequent by ground checks) discovered several other goldfields colonies in the Windsor area. From 1986 on, Guggolz and Guggolz monitored most of the northern Windsor populations annually, and the Waaland study in 1988/89 reconfirmed many sites.

Historically, approximately 30 occurrences of Burke's goldfields have been known to occur in the Windsor area, from the southern edge of the Sonoma County Airport to north of Arata Lane. Of the 30, 22 are considered extirpated by urban and commercial development or as a result of agricultural land use changes. Included were two of the largest populations in the County. At the

present time, only a few stable populations remain in the northern Windsor area. These are potentially threatened by urban development.

Approximately 85 *Lasthenia burkei* sites under separate land ownership have historically been reported in the study area. These occurrences represent approximately 18 separate biological populations. Of the 85 occurrences (based on this study), approximately 30 are considered extirpated and ten have some type of preserve designation. Of the extant populations, several have not been reconfirmed for a number of years and their current status is unknown. At least nine of the sites are or have historically been ensemble sites.

2.5 Ensemble Sites

While the pristine landscape probably supported a rich blend of vernal pool, meadow, and grassland species with much greater total area and continuity, there are currently only a few sites where more than one of the primary sensitive plants occur together. While a single species occurrence, or even just the presence of suitable vernal pool habitat generally represents a potentially significant resource and possible constraint on land use, multiple occurrences are scarce, indicative of especially valuable habitat conditions, and are generally regarded here as being of higher overall quality and importance. Appendix D provides a summary list of the surveyed sites with sensitive plants, including a preliminary indication of the more significant (e.g., ensemble) locations.

As additional detailed wetland surveys are conducted, it is likely that more ensemble sites will be found. This is likely to include communities with both sensitive plants and animals, such as several sites in southwest Santa Rosa which support tiger salamanders, California linderiella, and Sebastopol meadowfoam.

2.6 Resource Threats and Land Use Trends

On the Santa Rosa Plain, similar to the rest of the state, vernal pool habitat losses have been significant and have occurred due to both direct physical alteration and indirect effects (Airola and Messick, 1987; Waaland, 1989). Direct impacts to vernal pool habitat have come about as a result of land conversion to agriculture and urban development, as well as through stream channelization projects, irrigation, and the draining and filling of wetlands. Indirect impacts such as hydrological modifications, exotic species invasions, crop or stocking rate changes, and long term discing practices are more subtle and usually require longer periods of time to become evident, but have also had severe impacts on the regional habitat mosaic, flora and fauna. The following are brief discussions of land uses which have had and/or continue to affect the study area's vernal pools and related wetlands:

2.6.1 Land Conversion

Previous studies (Waaland et al., 1990) identified 12,000 acres (out of a 28,000 acre study area) of the Santa Rosa Plain have been converted to urban, cropland and orchard or vineyard. The habitat type most severely affected has been the oak woodland/savanna-vernal pool complex, which has the appropriate topography and soils for both agriculture and housing construction. Native biodiversity under these land uses is largely lost as a result of agricultural management (weed and pest abatement) practices or standard urban landscaping.

Urbanization - One of the two most important sources of change in the study area has been the conversion of natural habitats into urban situations. Roughly 25 percent (7,000 acres) of the 28,000 acre study is occupied by residences, subdivisions, rural ranchettes, golf courses, commercial buildings, and other forms of urban development. Conversion of the natural landscape (including wetlands) to urban use is generally complete and essentially irreversible, and involves all manner of disturbances, from hydrological and topographical alterations, to the installation of lawns and ornamental landscaping.

Agriculture - The second greatest source of land conversion stems from agricultural development and use. Approximately 3,800 acres of the 28,000 acre study area were identified as orchard and vineyard, and 1,000 acres are cropland (Waaland et al., 1990). Together, these intensive agricultural uses have converted 17 percent of the study area. Additional land in the study area is planned for vineyard expansion in the future.

2.6.2 Channelization

Another source of direct impacts to the valley ecosystem in general and the wetlands in particular stems from channelization of natural waterways. Streams channelized for flood control, such as Roseland and Colgan creeks, have been excavated through existing vernal pool terrain, interrupting hydrologic connections and filling wetlands with sidecast dredge spoils. While not studied in detail, such channelization is also likely to have a general dewatering effect on the overall landscape.

2.6.3 Filling and Draining of Wetlands

In the past, another source of impact has been filling and draining of seasonal pools for mosquito abatement purposes, making the habitat unavailable to migratory waterfowl and many plants. Both practices make conditions more favorable for pasture grasses at the expense of native plants. The placement of varying amounts of fill on private properties has been extensive over the years, including ranchers creating high ground for livestock to escape wet feet in winter, local improvements to and leveling of individual lots and gardens, and the disposal of excavated or graded material. Based on air photo analyses and reconnaissance surveys, low level backyard filling, both through onsite reconfiguration and the importation of fill continues without review or authorization on a small scale throughout the study area (C. Patterson, unpubl. field data).

2.6.4 Grazing

Since the arrival of Spanish colonists in the late 1700s, the Santa Rosa Plain has been subjected to the influence of grazing by domestic cattle, horses and sheep. Along with these animals came a host of introduced (non-native) plants which originated in Europe, Asia, and Africa. The combined effects of grazing by domestic herbivores and invasion by non-native plants has led to the indirect replacement of the native bunchgrasses and wildflowers with non-native annual grassland. These influences have also contributed to the decline in valley oak woodland, largely because regeneration is negligible where seedlings can be grazed. Despite the grazing pressure, many vernal pools under this management continue to support native species because most weeds cannot tolerate the hydrological conditions associated with the pool habitats. Grazing under typical stocking rates and schedules for this region is not especially compatible with the native vernal pool flora, although light grazing, particularly by horses, has been shown to work well with at least Burke's goldfields. Light grazing can be used to reduce thatch and keep the competing grasses at a minimum, both beneficial to the native flora, but heavier use almost invariably results in injurious trampling, direct plant consumption, local soil compaction, and physical damage to plants attempting to mature and set seed. Higher rates of use also tend to contribute excessive manure to the system with detrimental effects on water quality, biological productivity, and diversity.

2.6.5 Irrigation

Compared to grazing, the introduction of wastewater irrigation is recent, beginning in the 1970s. The effects on the valley ecosystem include a loss of oak woodland and a change in the plant composition of vernal pools. The effects of irrigation profoundly affect native pool species because they have evolved under a summer-dry Mediterranean climate. Application of irrigation during the summer alters the water regime of the soil, often creating perennial wetland conditions not tolerated by the native vernal pool flora. In upland areas, the standard seed mix of pasture grasses and

clovers has largely replaced the native wildflowers and bunchgrasses.

Irrigation of the naturally summer-dry valley oak savanna has also been implicated in increased mortality of trees. The prolonged moisture regime in summer makes conditions more favorable for attack by root fungus (*Armillaria mellea*) (Gross and Schmidt, 1989), and preliminary results of studies of irrigated oak savanna on the Santa Rosa Plain show accelerated loss of oak trees on lands under irrigation relative to unirrigated areas. The data indicate (Waaland et al., 1990) that after the onset of irrigation (1977), oak tree loss on irrigated lands was over five times greater than on unirrigated lands. Approximately 1,300 acres of unirrigated oak woodland remain, approximately six percent of its original extent. The remaining oak savanna areas constitute much of the available land planned for irrigation expansion. The other significant available acreages are composed of annual grassland-vernal pool complex in the south half of the study area and altered seasonal wetlands west of Rohnert Park.

To meet the demand for wastewater disposal, the Sub-regional Sewage Treatment System requires at least 100 additional acres of land on the Santa Rosa Plain annually. Growth in Windsor will add pressure to the Windsor Water Direct to expand reclaimed water irrigation to at least 1,000 acres in the northern part of the study area in similar habitats. The Sonoma County Airport area is already used extensively for wastewater irrigation, and the local sewage treatment plant continues to seek expansion of its irrigated acreage in this part of the study area. The ongoing need to expand effluent irrigation acreage to keep pace with population growth will continue to jeopardize the existence of oak woodlands and vernal pools on the Santa Rosa Plain unless other, less sensitive lands are found for irrigation or other means of disposal are found.

Plate 9. Wetland areas in private rural ownership are often used for livestock grazing, trash deposition, and other potentially disruptive activities.

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Plate 9. Wetland areas in private rural ownership are often used for livestock grazing, trash deposition, and other potentially disruptive activities.

3.0 RESOURCE SIGNIFICANCE AND EVALUATION

3.1 Objectives and Approach

Wetlands on the Santa Rosa Plain are important for several reasons. They represent highly productive and valuable natural habitats for indigenous (and some endemic) plants and animals, and are subject to governmental planning consideration under CEQA and federal regulation under the Clean Water Act. Together with vast grassland, oak woodland and savanna, the pristine wetlands provided extremely valuable resources for numerous wildlife species, with the vernal pools in particular representing highly productive and regionally specialized communities. The pools are especially valuable for their roles in supporting complex food webs (bacteria, algae, plants, invertebrates, amphibians, waterbirds, waterfowl, small mammals, and raptors), serving as resting and feeding resources along migratory bird routes, and fostering the evolution of a regionally unique wetland flora. Because of the combination of their resource values and legal constraints, jurisdictional wetlands need to be addressed in a technical manner. This involves identifying and evaluating the functions and values of specific wetland habitats, as well as comparing wetland sites in order to assess potential impacts, determine mitigations, and decide which sites warrant outright preservation.

The purpose of this section is to identify the factors, biological and non-biological, which are most useful in the determination of wetland site quality and significance. While some factors may not be important for certain sites, the discussions that follow are intended to assist in potential preserve evaluations.

3.2 Habitat Extent and Quality

Two of the most important aspects of the Plain's natural ecosystem are the extent of habitat (both wetland and upland) and its quality for indigenous plants and animals. Both of these factors play critical roles in determining what species survive, how productive and stable the system is, and how well an area can tolerate disturbance or change. As resource sites range from small, isolated and degraded sites to larger less altered areas, the ability of the system to support viable populations and communities increases. More precisely, however, as the Plain's mosaic of drainages and plant communities has been converted to human and agricultural uses, its ability to support the entire natural vernal pool - oak savanna ecosystem has severely decreased. Still, habitat extent and quality are important in the review of potential land use (e.g., preservation, mitigation, agriculture, development) on the remaining undeveloped lands.

In evaluating a site for potential preservation or development, the size is easy to quantify, but the amount of a particular habitat (or subtype) required to support each of the many ecosystem components varies greatly. In some cases, sites of less than one or two acres appear to be sufficient to maintain populations of certain native (including sensitive) plants and aquatic animals. Much larger acreage is often needed, however, to attract and support waterbirds, waterfowl, larger mammals, and raptors. Site quality is often difficult to define or quantify, and different conditions may be preferred by different species.

The extent and quality of wetland habitats on the Plain have declined with modern settlement. The natural network of seasonal wetlands and riparian corridors (along most primary creeks) has been dammed and/or diverted, channelized and buried in pipes. The entire headwater area for the Plain, from Windsor and Larkfield-Wikiup in the north, to Rohnert Park and Cotati has been developed, and most of the historic riparian forest and woodland along the primary creeks (Starr, Windsor, Pool, Mark West, Santa Rosa) has been removed. In the middle of the Plain (east to west, just west of the urban corridor along Highway 101), the low gradient drainage swales (meadows), vernal pools, and seasonal and perennial marshes have been fragmented, drained, and farmed, while the flatter, lower part of the valley floor on the western Plain has been extensively cultivated and irrigated.

There are currently about four major areas of wetland concentration in the study area. These are

northwest Santa Rosa, southwest Santa Rosa, the rural lands just west of Santa Rosa, and the immediate Laguna floodplain. These include concentrated areas of remnant wetlands, generally including multiple parcels and significant acreage.

Habitat quality has suffered dramatically, however, both in terms of individual site-by-site conditions as well as through areawide decreases in extent and diversity. Virtually all of the land and all of the wetlands in the study area have been at least moderately altered by past or ongoing land uses, and large sections of the plain's overall habitat landscape have been completely converted to cropland or other intensive non-wetland use. With severe depletion of overall habitat acreage and pervasive degradation, even the remnant habitats no longer represent more than a fraction of what they once did as part of the regional ecosystem. The remaining pools provide some suitable habitat for native plants, invertebrates, and some water dependent birds, although many of the larger mammal and bird species have moved elsewhere. Habitat quality is, therefore, relative, and although knowing the absolute minimum thresholds for sustaining populations and communities is important, current efforts must recognize the meager remaining universe within which any planned conservation/preservation efforts must take place.

In spite of the historic depletion of high quality habitats, there is still an abundance of land in the study area which could be restored because of the very low gradients and underlying dense clay layers. Even if native flora and fauna are not represented on a site, if the physical conditions are still present, restoration of considerable wetland value can still be attained. Sites, therefore, which may have no current sensitive species or natural communities may still constitute significant areas with respect to possible future restoration

In terms of habitat quality, the following are brief descriptions of the most relevant factors that affect wetland quality, determine their current significance, and factor into their potential for preservation/protection, restoration, or development:

3.2.1 Physical Factors

There are four primary natural physical factors that are important to the formation of wetlands on the Santa Rosa Plain. There are three substrate factors, including (1) the basic soil (with or without clays and/or other restrictive layers), (2) the general landscape gradient (facilitating or hindering surface drainage), and (3) the micro-topography (providing basins and runoff routes). Lands with clay soil, low gradient, and undulating topography tend to foster seasonal wetland development, while more porous soils allow water to percolate, slightly steeper slopes drain more thoroughly, and level or uniformly sloping terrain also drains more completely. These factors are inherently present and active (and hence less critical for evaluation) in areas with existing wetlands, while they are especially important considerations when determining the potential of a site for wetland restoration or creation.

The fourth major physical factor is annual rainfall, which is important both in terms of the annual total and the seasonal distribution. The study area's average of 30 inches of rain per year (almost all of which is received during the cooler season) combined with soils that have very low rates of transmissivity results in a relative water surplus during the main growing season (December through April), and hence, the formation of perched water tables and seasonal pools. While the total rainfall here is generally adequate to foster extensive wetland formation, drought is also a typical component of the ecosystem and should be considered in planning for preservation and restoration. Situations of marginal hydrology (e.g., swales, shallow isolated pools) either existing now or under restored conditions should be expected to perform less as wetlands and more as upland grassland in the drier years. Sites under consideration for preservation should be examined for their proportions of marginal versus more well developed wetlands, since in drought periods, shallow habitats may fail to provide significant wetland resources. A mix of habitat conditions (shallow to deep) is preferred in order for a fuller range of resources to be manifest in a given year.

Land use constitutes an important physical habitat factor that has altered several of the substrate parameters. The basic underlying restrictive layers have not been significantly altered, but cultivation and development of the land surface has changed the overall terrain and local

microtopography, turned and mixed the soils, and facilitated dewatering through ditching, channelization, and active draining.

3.2.2 Biotic Factors

The indigenous plants and animals of the Plain played various roles in the formation and functioning of the natural wetland - savanna ecosystem. Many levels of biological activity and ecological interrelationships have evolved, ranging from anaerobic bacteria, algae, and microbial decomposers, through a diverse food web of plants, seeds, invertebrates, and small animals, culminating in a myriad of migratory waterfowl, waterbirds, and raptors. Each species, population, and community contributed to the web, with the higher and more transient species of wildlife being dependent on the overall system. The native species and natural processes have been diminished, however, and now share the remaining habitats with numerous introduced species and human influences. Whole wetland communities and populations (e.g., large mammals, waterfowl, native plants) have been depleted and/or displaced in the study area, and much of the remaining biologic influence arises from livestock, cultivation of crops, and human use of the land. Pesticides, fertilizers, and soil amendments have localized impacts, and cultivation practices and general soil disturbances give exotic weeds an advantage in competition with the native species.

3.2.3 Socioeconomic Factors

Urbanization, agricultural development, and general private land use are major factors that have shaped the Plain's modern and current resource distribution and condition. These factors continue to affect wetlands and their potential for preservation. Dealing with these factors will be a critical component of the wetland conservation efforts on the Plain. As long as agriculture is important and viable economically, disruptive land use will continue to degrade and eliminate wetland resources. To the extent that urbanization continues to move into undeveloped areas, additional resource losses are likely to occur. Urban sites with fragmented wetlands will continue to be influenced by the full range of urban activities, while the urban fringe represents the major realm of potential future conflict between land development and resource conservation.

3.3 Criteria for Site Evaluation

Many factors may have bearing on a given site's level of quality, and therefore, its appropriateness for preservation, restoration, or development. This section identifies the main parameters which are relevant to the evaluation of wetland site quality and suitability for preservation. These are presented singly, but more often than not work in combination with other factors to determine a site's overall value. In general, the degree of disturbance, site size, and relative abundance of sensitive elements are the most important factors, although shape and/or proximity to incompatible land use can critically influence a site's suitability for preservation. Without regard to relative or absolute importance, the following are the parameters of potential value in assessing wetland sites in the study area:

3.3.1 Site Size

The size of a resource occurrence or site is often difficult to define since natural features cross legal lot lines and land uses, and many sites contain only fragments (sometimes physically separated) of a once more pervasive system. Wetland resource sites in the study area range from small urban set-asides and vacant lots of only 0.1 or 0.2 acre, on up to large ranches and dairies of several hundred acres. While some rare plants and even invertebrates may survive in small preserves, the emphasis from CDFG is that for management purposes such preserves should be a minimum of eight to ten acres. Site size is very important to the wildlife aspects of wetland conservation, and it is open to question how much small urban preserves serve the overall ecosystem values. Such small preserves may, however, be important with respect to unique plant or invertebrate resources, and may still warrant preservation.

3.3.2 Site Shape

In urban or rural residential areas, the shape of a potential preserve site can be important, with linear, highly convoluted, or oddly shaped parcels being more vulnerable to adjacent disturbances. Just as larger preserves are generally more stable and defensible, so are round or square parcels that minimize the exposed edges. Each potential conservation site should be evaluated with respect to shape, as should the overall vicinity (a potential collection of parcels) that might end up being placed in conservation use. In the more rural areas, shape is generally not as critical, but should still be considered in relation to the adjacent land uses.

3.3.3 Soil Type

There are four primary soils in the study area that foster seasonal wetland formation (see Section 2.1.1), although there are numerous phases and variations within these. The two main types of wetland soil are the dense clays of the Clear Lake clay series, and the generic silty clay loams over dense clay in the Wright, Huichica, and Zamora soils. Most of the study area's seasonal wetlands occur on only three soils (Wright, Huichica, and Clear Lake), but there are also many acres of degraded land on these and other soils, much of which is suitable for restoration. There are no unusual soils in the study area, but those that are present vary greatly in terms of clay content, depth to restrictive layer, continuity and thickness of restrictive layer, and presence of coarser materials. The analysis of subsoil profiles is an important element in preplanning wetland restoration and/or creation. Also, full representation of the region's soils in the eventual preserve system may be important to maintaining the full range of wetland functions and values (i.e., species, populations, and communities).

3.3.4 Geographic Location

There are several different geographic zones in the study area, but these are defined as much by nearby political entities and local land use as by any habitat zonation or floristic segregation. Based on historic air photographs and current ground conditions, a very large part of the pristine Santa Rosa Plain was dotted with seasonally wet swales and pools. However, large subregions (especially southeast of Santa Rosa, around Rohnert Park/Cotati, and in urban Santa Rosa) have been almost completely leveled, ditched, and converted to cropland or urban land use. While the wetlands tend to not be dramatically different across the various regions (although the backwaters along the Laguna have different hydrological regimes), the floristic aspects warrant some attention. First, the three federally listed plants have different distributions on the Plain (see Figures 6, 7, and 8), and several others (e.g., *Triteliaea peduncularis, Mimulus tricolor,* and *Navarretia leucocephala* ssp. *plieantha*) appear to occur only toward the northern part of the Plain. Whether or not distinct geographic forms exist is unknown, but if present, could argue for substantial geographic representation and careful restoration in order to preserve the full range of habitats, species, and genotypes. Some degree of areawide preserve representation appears to be warranted, but may also need to be weighed against the need for large contiguous preserve lands in the face of limited acquisition funds.

3.3.5 Naturalness - Degree of Disturbance

The degree of naturalness (or disturbance) is a major contributing factor toward site quality. It is likely that there are no truly pristine vernal pool areas left within the study area, since even the secluded, uncultivated, and currently ungrazed habitats were subject to long-term grazing and non-native species invasions. Contiguous expanses of natural topography and minimal land use disturbance greater than about 100 acres are scarce.

Several categories of naturalness can be recognized, including (1) the actual terrain or topography, (2) the soil profile, (3) local and/or areawide hydrology, (4) vegetation cover, (5) fauna, (6) land use, and (7) general degree of human use (e.g., degree of encroachment, human activities, ongoing ground disturbances). A lesser amount of alteration within any or all of these categories generally contributes to higher site quality, although topographic, hydrologic, and human use

factors are generally the most severe in their effects. If the terrain, buried soil conditions, and/or hydrology have been destroyed or substantially altered, wetland situations tend to be more tenuous, and restoration to a natural situation is more difficult. On the other hand, however, habitats can be lightly cultivated, disked, even planted, as well as thoroughly invaded by exotics, but if the natural topography, underlying restrictive soil layers, and hydrology are still present, even the most ruderal habitats have the potential to be restored to a relatively natural community.

The degree of disturbance or naturalness should be evaluated when considering the quality of a site, but objective, measurable methods are generally not available. Professional judgment and comparison with other sites could be used to assess various sites, but a large amount of variability is to be expected between evaluators based on perceptions of disturbance and non-quantifiable parameters (degree of human disturbance, extent of hydrologic alteration, etc.). Simple measurements or classifications of several factors could be used, such as the basic location of a site (urban, rural, agricultural), the presence and percent of natural terrain and vegetation, and ongoing land use, but considerable refinement and definition would be needed to implement a consistent 'naturalness' rating method.

3.3.6 Wetland Extent

The total amount of wetland on a site should not necessarily be a major evaluation factor, but in general, the larger the wetland area, the greater the value associated with the site. However, graded fields can be close to 100 percent jurisdictional wetland, but have no aquatic habitat values, nor any native vegetation, while tiny isolated fragments can still support unique floral or faunal elements. Some consideration of wetland extent is appropriate for site assessment, but absolute acreage should be integrated with other habitat values, location, and site quality. The objectives to be served by each prospective site acquisition should also be clarified in order to determine whether or not wetland extent is critical.

3.3.7 Wetland/Upland Ratio

There is a wide range of wetland/upland ratios present in the study area, from zero to almost 100 percent. Under natural conditions and without regard to legal boundaries, roughly between about 10 and 30 percent of a given land area could be expected to qualify as wetland on much of the Santa Rosa Plain. The definition of what constitutes a "site", however, is as relevant as the actual landscape configuration and should be considered when evaluating wetland to upland ratios. While the ratio of one habitat type to the other varies across the Plain, the important consideration is simply to allow for an adequate amount of upland to function with the wetland, be it in a natural wetland preserve or on a mitigation site. Isolated wetland with no appreciable upland is not representative of the Plain's natural conditions and does not offer the best opportunity for long term wetland resource conservation. While the natural target range of 20 to 30 percent (or perhaps as much as 40 percent) wetland on a given site can be used as an ideal, the actual total amount on a given site is probably not one of the more important factors and should be used as a secondary evaluation tool, primarily in the comparison of sites.

3.3.8 Habitat Diversity

As with most ecosystems, simple homogeneous habitat expanses are generally less productive, less stable, and less ecologically valuable than those with greater habitat diversity. While most seasonal wetlands in the study area are strictly herbaceous and dry in summer, there is still considerable variation and diversity within the habitats present. Each separate habitat supports a slightly different plant community, which in turn favors different assemblages of animals. The regional range includes non-ponded, shallow and intermittently ponded, deeper and persistently ponded features, plus grasslands and oak communities of different compositions and plant densities. The resulting mosaic of many such habitats and communities comprises the overall ecosystem which provides the numerous ecological values to the associated food web. The fewer the habitats and/or communities, the less well developed the overall web or ecosystem is likely to be. With a full spectrum of habitat conditions and communities, the resulting system is more

productive, more efficient in resource use, and more resistant to perturbation.

The significance of habitat diversity and/or community variation in smaller fragmented habitats is not known, but in general, the greater the habitat variation in a given area, the better it can weather droughts, species invasions, and other disturbances. A potentially significant topic for investigation would be to determine whether fragmented habitat areas can ever regain major ecosystem values, or if at some threshold acreage (possibly even different for different land uses), smaller areas simply cannot support more than certain adaptable individual elements of the overall system. Without knowing if there is a minimum size or degree of diversity for the ecosystem to function, it is generally assumed here that greater habitat variability and community diversity are favorable traits and desired aspects of wetland conservation areas.

3.3.9 Species Richness

Similar to habitat diversity, a greater number of species supported by a community generally translates into higher productivity, better resource use, and higher resiliency to disturbance. Native wetlands in the study area typically support anywhere from just a few plants (often less than about eight in shallow swales), to more than 15 species in larger wetland features with deep and shallow zones (C. Patterson, unpubl. field data). Little is known about the floristic variation in wetlands across the Plain, although at least a few species are known to be restricted to particular geographic sub-regions.

In terms of the region's wetlands, shallow to medium depth vernal pools have the highest species richness, while deep pools become somewhat more depauperate as the harshness of the growing conditions intensifies. Swales are dominated by just a few well adapted (meadow) species (not to mention that they have been overwhelmed by common introduced grasses).

3.3.10 Other Habitat Values

While wetlands and endangered species are the two primary factors of significance, the presence of other natural elements such as native oaks, riparian corridors, extensive open grassland, or creekbeds may add to the overall value and integrity of a site. It is difficult to quantify how such features function or add to the habitat mix, but it should be kept in mind that such elements can be very important and should be considered when evaluating lands with wetlands. The degree to which such other features may be important depends on many factors, but case by case analyses by qualified biologists are needed to make such determinations.

3.3.11 Number of Sensitive Species/Elements

As discussed above regarding habitat diversity and species richness, a general increase in the number of sensitive elements that occur together indicates a higher degree of overall value and sensitivity, but all relevant factors must still be considered in making evaluations. Multiple occurrences of sensitive species (ensemble sites) are not common, however, and almost all such situations should be regarded as relatively unique and worthy of close consideration for preservation. Sites with both sensitive plants and animals probably constitute the most important habitats since they clearly serve the needs of more than just one or two components.

3.3.12 Population Size(s)

At least as important as the number of sensitive species present is the population size (or more accurately, viability) of such species present. No minimum population sizes necessary for maintaining a population have been determined for the species in this region (plant or animal), but the issue of habitat amount and population size may be paramount to the long term survival of the species involved. Several sensitive species appear to be able to persist in small habitat pockets and with low total colony numbers (e.g., Burke's goldfields at the Pioneer 2000 and Seville Estates set-asides, tiger salamanders at the Finley/Wright Road site), but other sites with small reported

numbers have also apparently disappeared in recent years. Compounded by the ability of several vernal pool annuals to fluctuate widely in numbers from year to year, the factor of population size is largely an unknown. One conclusion, however, that can be made, is that larger populations (or at least more extensive occupied habitat) are generally better able to cope with various environmental stresses than small ones, and larger populations are desirable in preserve situations. Careful long term monitoring is needed to clarify the abilities of vernal pool species to adapt and persist, as well as to simply define the natural range of variation that should be expected under stable conditions.

3.3.13 Genetic Variability

Although there are only meager data, the results of two studies indicate that genetic isolation and differentiation in plants may be occurring on the Plain. The potential for such genetic divergence is an important factor in considering if or where to move salvaged materials, and may be important in determining what combination of sites is placed in preserves. Burke's goldfields appears to be arranged into at least three somewhat different forms (B. Guggolz, pers. comm.), including the populations outside of Sonoma County, and two forms in the study area: one along the Laguna and another in the headwater systems east of the Laguna floodplain. Studies by Schaffer (1992) on the California tiger salamander also indicate that the regional form may be genetically distinct from the populations of the central Valley and other parts of the state. Both the unknown existing variation and the issue of mitigation salvage and transfer will continue to be factors to consider.

3.3.14 Associated Species

In addition to the sensitive species that have been officially recognized and protected (and which factor heavily into site preservation considerations), there are numerous other species associated with the study area's wetlands that are worthy of consideration. In general, sites that support multiple native wetland species (e.g., entire wetland communities) are more productive and ecologically stable (and represent better preservation opportunities) than sites with just a single sensitive species occurrence. In some cases, sites with exceptionally large populations of a single sensitive species would still represent important preservation elements, even if other native vegetation is not present (or at least not abundant). However, in the consideration of sites for preservation, habitats that represent a wider range of natural wetland conditions and a richer flora are probably better suited for long term wetland conservation and may constitute higher priorities. Occurrences of sensitive species that also include other native wetland vegetation are generally more valuable than more homogeneous stands of a single species. An inventory of all species present on a given wetland site should be made, especially when development or land use changes are proposed.

While there are only a few individual species that are formally protected, their scarcity is the result of habitat depletion. As a generic habitat type, vernal pools warrant preservation efforts with or without sensitive species, and sites with exceptional examples of natural pool communities should all be considered for preservation. There may be sites that warrant preservation on the basis of containing exemplary habitats and/or abundant native species, even though none of the recognized sensitive plants or animals may be present.

3.3.15 Habitat Stability

Wetlands on the Plain are not only subject to the wide natural fluctuations in annual weather patterns, but are also influenced by ongoing and often changing land uses. The ecological stability of a given wetland site is related to the integrity of the topography, soil, hydrology, plants and animals, both onsite and on adjacent lands. If any or all of these components are altered, the stability of a site's wetland resources(species and communities) can be affected. The basic physical factors of soil impermeability and very low grade are difficult to change without grading, filling, or excavation, and even intense long term farming on the Plain has not broken the underlying clay layers. Surface soils have been turned and compacted, but their inherent propensity to pond remains. Physical substrate conditions are, therefore, relatively stable over a large part of the study

area. However, site specific analysis is recommended to determine if current conditions are stable or subject to recent, ongoing, or future changes. The lower the degree of physical substrate disturbance and alteration, the more stable a site is likely to be over the long term, and the better it will be as a preservation site.

Altered hydrology is pervasive in the study area, and although the effects of such dewatering are not well known, this phenomenon probably accentuates the periodic droughty conditions (and may reduce the acreage of wetlands on adjacent lands) and tends to decrease a site's long term habitat stability. Hydrological integrity (or alteration), historic or future, is an important evaluation factor and may require investigation both onsite and on nearby lands. What constitutes hydrological stability is not clear given the extreme fluctuations in rainfall, but most likely the effects of development have been to dewater the Plain slightly, accentuate drought conditions, and introduce incremental instability. Without broad landscape sheet flow, smaller isolated wetland sites are likely to suffer hydrologically over the long term.

Overall habitat stability depends on many factors, including substrate and hydrological alterations, habitat fragmentation, and land use, but is difficult to evaluate objectively. It is also difficult to assess whether or not previously disturbed sites have stabilized or continue to change. The important consideration here is to identify what land use and habitat changes have occurred already, or are likely to occur in the future, and to determine whether or not such changes have stabilized or are likely to continue. Recent changes made in the landscape (such as along the urban boundary) indicate that a new habitat equilibrium may be years away.

3.3.16 Biotic Uniqueness

The great complexity of natural communities occasionally results in features or sites that are exceptional or very unique. Such situations may not be apparent from the assessment of other more definable factors, but should be recognized and considered. Examples include uncommon co-occurrences of species (e.g., sites with multiple species in key genera such as *Blennosperma* and *Limnanthes*), unusual substrate conditions (such as the seep-supported meadowfoam colonies at the "Gundelfinger" site), sites with historically favorable management regimes, populations of key species with recognizable variation, features of peculiar shape or configuration (e.g., individual pools of extremely large size), and situations with exemplary habitats or populations. Most determinations of such conditions will depend on careful evaluation by trained biologists.

3.3.17 Proximity to Other Valuable Habitats

Just as offsite disruptive influences can have an adverse effect on the integrity and quality of a given site, the presence nearby of additional resource values can also have a positive effect. Sites being considered for preservation should be analyzed with respect to possible additional habitat values on adjacent lands. Similarly, for wetland sites that are preserved, the possibility of adding adjacent lands that would increase the overall value through larger area protection should be considered, even if wetlands are not a primary issue with those lands.

3.3.18 Land Use

Basic land use (past and present) dictates the nature and degree of disturbance on a given wetland site, and plays a primary role in determining habitat quality. Land use in the study area is primarily agricultural and ranges from light to heavy grazing (savanna and open pasture to feedlot), from dryland hayfields to irrigated croplands and orchards. Urban areas typically include complete leveling, landscaping and artificial drainage, but vacant parcels may still support wetland resources. For some land uses, such as heavy grazing or summer irrigation, simple removal or modification of the activity may result in substantial habitat recovery. More intense land uses have the potential to irreversibly alter soils (compaction, broken clay layers, fill, amendments), hydrology (dewatering, contamination, drainage patterns), and topography.

Land use trends indicate continued intense land management in the study area, and many activities

allowed on private lands are not compatible with the conservation of wetland resources. The effects on wetlands are often direct (filled, drained, graded) and relatively obvious, but may be more difficult to define on sites with intermittent, low-level, or changing uses. Multiple land uses on a single legal parcel or across a larger wetland area may be problematic and should be evaluated when considering site acquisition or preservation. Future land use, proposed or as allowed under City/County planning provisions can also be an important factor in the success or failure of a given preservation effort.

Evaluation of potential future land use should consider what is possible on a given site as an economic activity for the owner. The pressure for landowners to use their land in an economically viable manner increases with time, and the need to intensify use occurs. In considering potential preservation sites, the allowable use of the land may be paramount to the acquisition effort. Land zoned for urban development is generally more immediately threatened than rural lands, and is more expensive as well. Even in rural areas where land is not zoned for subdivision or development, small changes in land use for the owner (such as accepting treated wastewater for irrigation) may result in drastic changes to the local biological communities and the viability of preservation. Certain geographic locations may make a site highly valuable for particular activities such as wastewater pond construction, airport runway clear zones, wastewater irrigation, utility corridors, road widening projects, agricultural preserves, community separators, and open space designations. Acquisition efforts, particularly in the urban setting, need to assess the value of the specific resources to be preserved in light of the area's predominant land use trend.

An important factor to consider then, is what land use changes may be likely over the foreseeable future. In evaluating a prospective preservation site, some attention needs to be given to (1) what future land uses could occur here (or on adjacent lands), (2) what type of pressure is there in this particular area for land use change (prime for grapes?, wastewater available nearby?, subdivision?, potential annexation?, etc.), (3) has the property recently changed ownership, (4) what is the minimum lot size in the area, (5) is there pressure to change from the current use, (6) is the land in any community separator or open space designation, and (7) are there any actual plans to change land use.

While it may be subjective, some effort is needed to assess how urgently a site needs to be protected in the face of likely land use changes. The degree of potential threat to a site varies over time and according to factors that are not well defined (e.g., stocking rates, fertilization and irrigation, crop management). Some acquisition decisions may need to be made on the basis of which properties are most threatened with new land use changes. In general, lands which are not under immediate pressure to be used differently (or more intensively) are less threatened and may be lower priorities for preservation. However, given the unpredictability of private land use and management in the region, it should never be assumed that a given site is safe from disruptive land use changes simply because there may be no apparent current need or desire to so change. Further, many incompatible land uses are legally possible without the need for review or permitting. Virtually all privately owned wetland sites should be regarded as vulnerable until actually protected under fee title or conservation easements.

3.3.19 Adjacent Zoning and Land Uses

Just as nearby (offsite) resource values can add to a given site's ecological value, so can nearby land uses detract from it. Acquisition and/or easement protection for a given site should involve some consideration of what land use changes are occurring or are likely on adjacent lands, especially for smaller sites. Potential preserve establishment in areas of probable future land use changes (e.g., annexation or wastewater irrigation) may need to include greater efforts to preserve larger buffers, or may render medium and smaller sites without exemplary resources as lower priorities for preservation. Adjacent land uses in urban areas often render preservation efforts for small vacant lot situations of questionable value. Many such sites may need to be evaluated with a different perspective than more rural lands.

Especially problematic are the lands that occur along the urban boundary. These are areas where current conditions may include significant wetland resources (often without major urban influences

at this time), but where surrounding properties are becoming ever more valuable for residential development or other more intensive uses. Preserve design and protective buffers in such areas may need to be different (or even designed for different purposes) than for sites located in more rural areas. Adjacent uses and future development need to be major considerations when evaluating urban resource pockets.

3.3.20 Defensibility

The defensibility of a potential preservation site is an important factor, but one which is difficult to quantify or accurately evaluate. This factor relates to how well a site can be protected from unauthorized use (trash dumping, off-road vehicles, wildlife harassment) and general daily disturbances. In general, the larger a site is and the more rural and less convoluted in physical shape, the more defensible it will be. Also, woody vegetation around the edges, the presence of major barriers (e.g., flood channels, railroads or major roadways) along certain sides, and the amount of existing fencing all help make a site more defensible. Shape and proximity to other disruptive land uses are important considerations.

To a certain extent, fencing, tree planting, and other measures can be used to increase defensibility. However, some situations, such as being next to major subdivisions, schools, industrial uses, or in a linear configuration can severely constrain the ability to protect a site over the long term. A more subtle component in the long term maintenance and protection of a site may relate to nearby hydrological changes or influences that may not be under the control of the resource managing entity on a given preserve. Sites that receive runoff from urban or industrial land uses (or have been completely cut off from natural watershed input) may be greatly compromised, thus effectively reducing the ability to maintain or "defend" the site's resources.

3.3.21 Accessibility

In general, accessibility is not a factor which enters prominently into potential preserve acquisition. In most cases, in fact, lack of public access is a positive aspect. This factor is often interrelated with site size and shape, geographic location, adjacent land uses, and overall defensibility. Public access may be desired in some cases and can serve a useful purpose in public education and local policing (trash cleanup, reporting unauthorized activities), as well as cultivating a general land stewardship ethic and appreciation for wetland resources. Existing and historically established public access may be a problem in some areas, especially where residents have already come to regard certain vacant lands as available for walking, pet exercising, off-road vehicle use, and other recreational pursuits. Public access is not, however, a necessary condition of site preservation, and in most cases, restricted access should be preferred. Urban preserves may need to be designed differently (with greater access restrictions for critical resource features) or even with different goals (e.g., geared toward limited public use and/or education rather than the preservation of full ecosystem values) than the more rural preserves.

3.3.22 Site Availability

Site availability is always a factor based on the reality of whether or not a landowner is willing to sell or grant a conservation easement. While various public land acquisition entities are often bound by law or policy to only pursue lands with willing sellers, the evaluation of potential preserve sites should not necessarily use this factor in completing relative site rankings or priorities. Site evaluations geared toward the ranking of resource occurrences should focus on the resource values present, socioeconomic factors of location, size, land use, and defensibility, with site availability left to the acquisition process. Sites with high resource values should still be identified as such, and may need to be left out of active pursuit efforts, but whether or not a site is currently available should not be a major factor in completing the resource assessment and site ranking process.

The availability of land changes with time, and site information should be compiled for all significant resource areas in the event that future landowners (e.g., heirs) decide to make the land available. It does not appear that legal condemnation and forced acquisition from unwilling

"sellers" is a viable or desirable means of acquiring preservation sites. The process of identifying high quality sites and pursuing their protection will need to address this issue as the overall wetland conservation effort progresses on the Plain. However, it may be feasible in the future for the City, County, or State to provide incentives and/or programs involving compensation, land trades, or other economic offers (e.g., sale as mitigation banks) whereby currently "unavailable" lands may be protected.

3.3.23 Management Potential

The management potential of a given site depends on numerous factors (many of which have been identified earlier), and is an overall aspect of site preservation that is difficult to define or quantify. It may be even more important, however, to be able to effectively manage a preserve over the long term as it is to simply acquire the site and establish the initial physical protection. This is especially true in the more urban areas where significant landscape alterations may already have occurred to a point where long term viability is not feasible. The overall manageability of a given site should be evaluated as a synthesis of the other more distinct factors, and some reduction in priority may be warranted for situations where control over the basic habitat processes is not possible.

3.3.24 Economic Feasibility

Similar to the issue of availability, the cost of acquiring a given site will ultimately come into play during the acquisition process, but should not be given importance in the evaluation phase. Larger sites and those in the urban sphere of influence will tend to be more expensive, but if the resources are high quality, the primary ranking of priorities should reflect this. A comparison of sites and their costs will likely be necessary once the acquisition effort is implemented.

3.3.25 Areawide Planning

Related to future land use changes, site defensibility, and overall manageability, the areawide planning process needs to be factored into the preservation effort. Changing development pressures and resource protection needs should be recognized and addressed according to subregions and more localized planning areas. General Plan amendments, urban boundary issues, and the growth of the region in general need to be considered when determining the larger system of preserves to be established. Given the costs and management problems associated with preserving the more valuable urban lands, certain areas may warrant different guidelines and requirements depending on their geographic location, biologic uniqueness/commonness, and/or the ability to maintain viable long term resource values.

Some general (i.e., urban) areas that contain relatively minimal, common, or highly fragmented wetland resources may be more suitable for development (with the appropriate permitting and mitigation) than for conservation. Highly urbanized areas may not necessarily warrant the same level of protection given to other areas with greater integrity, wetland density, or resource quality. Still other areas that contain highly unique sites or populations (even though fragmented or less extensive) may need to direct changes in the currently planned growth of such areas. The eventual system of preserves should not only encompass the full range of hydrologic, soil, biologic, and geographic wetland resources, it should also be cognizant of the everchanging socioeconomic landscape, the need to accommodate some urban expansion, and the increasing pressures on landowners to realize a return from their lands

4.0 SITE EVALUATIONS AND RANKINGS

4.1 Use of Evaluation Criteria

While there are numerous potential evaluation parameters and many possible levels of weighting within each, there are no standard methods by which all wetland sites can be evaluated objectively, resulting in a single list of preservation priorities that is scientifically based and defensible. The many different important resource and site factors involved dictate a more subjective approach in assessing priorities for wetland preservation. To the extent that objective criteria can be integrated into an evaluation procedure (either to rate potential preserve and mitigation sites, or to determine the appropriateness of development), there should be site-by-site consideration of all factors, although sometimes certain factors may be weighted differently for different subregions or resource situations. Further, there are few enough sites left that support the listed species and/or constitute relatively natural situations, that a rigorous evaluation and ranking effort does not seem warranted or particularly necessary to establish priorities.

4.2 Site Rankings

No rigorous ranking or single list of sites have been compiled as part of this study. Rather, several lists of sites (see Appendix D) supporting endangered species have been prepared, in generally descending order of size and significance. It should be recognized that there are numerous different resource situations that warrant protection, and it is difficult to compare (in terms of the need for preservation) small sites with sensitive species against large areas of pristine habitat without such species, or urban fragments with little waterfowl value against rural properties with good wildlife value. Examples of situations that may warrant protection, but might not rank high based on a generic evaluation scheme include solitary occurrences of unique species assemblages, special soil situations, geographic outlyers, especially large or unique populations, and areas of exemplary habitat even without sensitive species currently in evidence.

General ranking of sites can be made, including overall ratings (largely proportional to sensitive species occurrences and site size), but may be more useful if subdivided into categories that could include (1) each of the endangered species, (2) soil and geographic uniqueness and representation, (3) the degree of demonstrable threat, (4) site size and extent of habitat to be saved, (5) sites with high restoration potential, and finally once individual site evaluations have been made, (6) availability and cost.

4.3 Priorities for Preservation

While there are numerous factors that could be analyzed for possible rankings of the known sites, there are relatively few large, high quality sites left in the study area (C. Patterson, unpubl. field data; B. Guggolz and M. Waaland, pers. comm.). Because of the limited number of sites known to still support sizable populations of sensitive species and/or significant acreage of relatively undisturbed vernal pool habitat, the priorities for preservation include virtually all sites with viable populations of sensitive species, generally in descending order based on acreage (from larger to smaller sites). Site size is a major consideration, with small sites (generally less than about 5 acres) being much more vulnerable to outside influences and adjacent land use disturbances. Such small sites, especially if isolated or in urban areas, present difficult management and defensibility issues, and generally offer low potential to preserve, restore, or conserve wetland wildlife values. With regard to botanical resources and the less mobile aquatic animal species, however, even small sites can represent viable situations. Even these represent management problems, and the long term viability of such preserves is unknown.

Availability (i.e., willing sellers) is a major issue in this regard, and acquisition efforts will likely need to address sites with willing sellers before others. With a severely limited universe of sites containing known high quality resources, however, theoretical acquisition priorities should be determined on the basis of biological site quality, plus the degree of imminent threat, size and location, and defensibility/manageability.

In spite of the numerous parameters identified as being relevant to site quality (including the extreme variability within some), one level of preservation priority must address the different sensitive species at issue. Specifically, separate priorities should be identified for each species of major concern, in addition to sites with species ensembles or extensive wetland habitat. For example, while there may be a number of good potential preserve sites that contain one particular species, preservation priorities should recognize the need for preservation of other species occurrences, even if they occur on smaller, more degraded properties. Similarly, the full geographic distribution of any given sensitive species should be considered in prioritizing acquisitions. Consideration should be given to the range of soil types and hydrological systems, with all significant situations represented in the eventual preserve system, rather than simply acquiring several large parcels in one particular area or in one (more common) situation.

The ultimate preserve system needs to include the full range of soils and habitat conditions, good geographic representation, and as many large undisturbed properties as possible. Once a regional analysis of the remaining sites is made and the various location, quality, and site characteristics are sorted into categories that need to be represented, the superimposing of availability will likely result in a relatively short list of priority sites. Finally, even with all of the data collection, site evaluations and comparisons that are possible, the ultimate acquisition of properties for inclusion into the regional wetland preserve system will likely hinge upon availability, acquisition funding, and professional judgment.

4.4 Priorities for Restoration

There is an abundance of land in the study area that is suitable for restoration. The greatest potential is land that has suitable clay soil and relatively undisturbed topography and hydrology. Grazing lands, irrigated (but ungraded) hayfields, and lightly cropped properties represent the best opportunities for restoration in that simple removal of the current disruptive land uses would probably result in considerable natural recovery of the wetlands on these lands. Some active restoration efforts may be necessary to remove well established weeds and reestablish native plant species, but with natural drainage patterns and suitable soils still intact, such efforts could be highly successful.

Lands which have been disked, cultivated, graded or filled may also have potential for restoration, but closer investigation would be warranted to determine the potential degree of recovery possible before embarking on major restoration efforts. If soils and/or hydrology have been altered, restoration may be much more difficult if not impossible. Minimally altered topography can often be returned to suitable terrain for wetlands, and even much of the region's cultivated Clear Lake clay could be reconfigured to foster wetland formation.

A distinction should be made in relation to restoration in that the reestablishment of true vernal pool communities may not be possible in some situations, while other seasonal wetland habitats and values may be attainable. Each type of wetland has its own inherent values, and restoration efforts should recognize that some sites offer potential for some types and not others. Restoration efforts, therefore, need to clearly identify the goals and types of habitats to be established, and sites being considered for restoration need to be examined with the various levels of potential in mind. Where vernal pools per se are involved, more rigorous site investigations may be warranted to determine suitability and to direct the design work. Greater detail may be needed in designing a new drainage/habitat reconfiguration that truly represents the pre-disturbance grades and avoids situating the restored pools on previously non-wetland ground.

In response to several recent development projects, wetland habitat creation has also been attempted on the Plain. Such habitat creation occurs on land where minimal wetlands now exist and where historic wetlands may not be evident. If suitable soils and terrain are available, such efforts can result in the establishment of valuable wetland communities. This type of effort generally requires significant soil removal and careful grading to attain a shallow layer of loam over clay, configured in low gradient swales and basins. Details of habitat creation efforts are not presented here, but such efforts constitute a potentially useful means of retaining net wetland acreage in the study area as well as providing suitable new habitat for native plants and animals.

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APPENDIX A

Precipitation Data For Santa Rosa

1888 - 1992

Source: City of Santa Rosa

Santa Rosa Wetland Baseline Study

SANTA ROSA OFFICIAL STATION CHRONOLOGICAL LISTING JULY THROUGH JUNE PERIOD

RAINFALL YEAR		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1888	1889	0.00	0.00	0.62	0.00	3.48	5.37	1.77	0.35	7.92	1.09	2.93	0.25	23.78
1889	1890	0.00	0.00	0.00	8.78	4.39	15.94	12.84	4.74	6.15	1.82	1.40	0.00	56.06
1890	1891	0.00	0.00	0.20	0.00	0.00	3.93	1.25	10.49	1.22	2.39	1.23	0.00	20.71
1891	1892	0.75	0.00	0.20	0.20	1.50	8.64	3.43	5.07	4.14	2.65	3.78	0.00	30.36
1892	1893	0.00	0.00	0.00	1.44	3.37	6.55	4.13	5.56	6.59	2.07	0.80	0.00	30.51
1893	1894	0.00	0.00	0.25	0.52	4.82	2.61	9.61	3.78	1.31	1.08	1.84	1.30	27.12
1894	1895	0.00	0.00	1.50	2.55	0.89	13.41	18.42	3.35	2.94	1.35	1.39	0.00	45.80
1895	1896	0.33	0.00	0.37	0.00	1.83	2.95	10.57	0.69	3.53	4.70	1.45	0.00	26.42
1896	1897	0.00	0.00	0.46	1.50	5.09	6.42	2.27	6.25	5.50	1.03	0.57	0.83	29.92
1897	1898	0.00	0.00	0.10	1.88	2.18	6.82	1.81	5.32	0.66	0.38	3.32	0.17	22.64
1898	1899	0.00	0.00	0.82	1.07	1.18	1.20	6.77	0.00	8.57	0.67	2.09	0.00	24.15
1899	1900	0.00	0.15	0.00	5.94	5.44	4.78	4.98	0.77	3.72	2.83	0.60	0.16	29.37
1900	1901	0.00	0.00	0.00	4.41	5.60	3.35	6.05	5.77	0.90	3.31	1.12	0.00	30.51
1901	1902	0.00	0.00	1.17	1.18	4.22	2.25	1.79	14.40	4.54	2.61	1.79	0.00	33.93
1902	1903	0.00	0.00	0.00	3.70	5.00	4.43	6.38	2.58	6.49	0.60	0.00	0.03	29.21
1903	1904	0.00	0.00	0.00	0.64	9.65	3.59	1.77	12.23	12.93	2.99	0.24	0.07	44.11
1904	1905	0.00	0.00	4.39	4.60	2.74	4.50	5.53	4.26	5.59	1.45	2.93	0.00	35.99
1905	1906	0.00	0.00	0.00	0.00	1.97	1.81	10.95	5.24	7.95	0.72	3.31	1.23	33.18
1906	1907	0.00	0.00	0.16	0.00	1.88	6.79	7.57	5.17	11.21	0.34	0.32	1.00	34.44
1907	1908	0.00	0.00	0.46	0.87	0.13	6.30	5.61	4.00	1.45	0.30	0.85	0.08	20.93
1908	1909	0.02	0.00	0.00	1.37	2.12	4.00	18.45	8.74	3.98	0.00	0.00	0.07	38.75
1909	1910	0.00	0.00	1.29	1.73	4.53	7.61	4.94	3.75	4.17	0.85	0.08	0.05	29.00
1910	1911	0.00	0.00	0.01	0.68	1.76	1.68	14.20	2.75	4.96	3.04	0.44	0.02	29.54
1911	1912	0.00	0.00	0.00	0.58	0.72	2.41	3.39	1.09	4.69	1.54	2.88	1.14	18.44
1912	1913	0.00	0.00	2.99	1.47	5.11	1.76	6.11	0.58	2.73	1.91	1.28	0.05	24.01

SANTA ROSA OFFICIAL STATION CHRONOLOGICAL LISTING JULY THROUGH JUNE PERIOD

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
1913	1914	0.07	0.00	0.00	0.00	7.50	11.15	14.00	5.60	1.49	1.66	0.95	0.41	42.83
1914	1915	0.00	0.00	0.07	1.91	1.30	7.23	9.08	13.52	3.98	0.65	4.82	0.00	42.56
1915	1916	0.00	0.00	0.00	0.20	1.71	8.34	15.20	3.53	1.89	0.00	0.65	0.06	31.58
1916	1917	0.61	0.32	0.32	1.17	2.68	5.92	2.37	5.15	1.22	2.52	0.14	0.02	22.44
1917	1918	0.00	0.00	0.33	0.00	1.49	2.25	1.43	7.06	4.73	0.86	0.03	0.00	18.18
1918	1919	0.00	0.03	2.52	1.04	3.96	2.55	5.59	0.52	2.30	0.50	0.20	0.00	27.21
1919	1920	0.00	0.00	0.58	0.25	0.30	4.35	0.40	1.35	3.06	2.46	0.00	0.50	13.25
1920	1921	0.06	0.00	0.10	3.00	7.78	8.65	9.60	1.83	2.74	0.75	1.19	0.00	35.70
1921	1922	0.00	0.00	0.15	0.63	2.03	8.78	1.10	6.81	3.66	0.25	0.52	0.06	23.99
1922	1923	0.00	0.00	0.00	2.79	4.92	10.84	2.27	1.14	0.05	5.24	0.22	0.44	27.91
1923	1924	0.00	0.22	1.76	0.50	0.48	1.25	4.50	5.58	0.03	0.43	0.33	0.01	15.91
1924	1925	0.01	0.01	0.01	4.34	2.35	7.33	1.88	14.42	3.93	1.77	5.11	0.01	41.17
1925	1926	0.07	0.01	1.17	0.19	3.53	1.53	8.84	6.88	0.25	9.58	0.40	0.00	32.45
1926	1927	0.02	0.03	0.02	1.37	12.64	2.91	6.82	10.93	3.68	3.47	0.43	0.40	42.72
1927	1928	0.01	0.01	0.01	1.98	7.48	3.71	3.10	3.52	6.96	1.97	0.18	0.00	28.93
1928	1929	0.00	0.00	0.00	0.34	4.28	5.02	1.48	2.10	2.10	1.30	0.13	2.48	19.23
1929	1930	0.00	0.00	0.00	0.04	0.00	12.47	5.40	3.91	2.53	1.58	0.62	0.00	26.50
1930	1931	0.00	0.00	0.44	0.87	1.40	0.62	6.52	1.87	2.94	0.49	0.90	0.67	16.72
1931	1932	0.00	0.00	0.00	1.40	2.27	11.29	3.45	1.49	1.21	1.43	1.65	0.00	24.19
1932	1933	0.00	0.00	0.00	0.08	1.69	4.06	6.40	1.51	4.64	0.12	2.23	0.00	20.73
1933	1934	0.02	0.00	0.17	2.02	0.00	8.14	1.75	4.69	1.13	0.73	1.39	1.00	21.04
1934	1935	0.00	0.00	0.03	2.28	5.19	3.45	7.36	3.50	6.31	6.87	0.00	0.00	34.99
1935	1936	0.00	0.12	0.23	1.02	1.47	3.09	7.77	11.81	1.58	1.86	0.61	0.00	30.36
1936	1937	0.00	0.03	0.00	0.22	0.02	2.90	4.02	8.59	6.31	1.87	0.19	1.28	26.33
1937	1938	0.05	0.00	0.00	1.03	7.47	5.40	4.77	9.66	8.03	2.45	0.06	0.00	38.92
1938	1939	0.02	0.00	0.38	2.18	2.22	2.14	3.36	1.61	2.41	0.14	1.12	0.00	15.58
1939	1940	0.00	0.00	0.08	0.52	0.46	2.88	10.87	12.31	7.14	1.84	1.96	0.07	38.13

SANTA ROSA OFFICIAL STATION CHRONOLOGICAL LISTING JULY THROUGH JUNE PERIOD

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
1940	1941	0.00	0.00	0.50	1.82	2.59	13.56	11.02	6.22	5.59	6.71	1.84	0.30	52.11
1941	1942	0.00	0.00	0.13	1.53	2.98	9.12	6.50	6.65	3.78	5.58	1.67	0.00	39.94
1942	1943	0.02	0.00	0.15	1.23	5.75	5.80	9.28	2.73	4.85	2.67	0.05	0.00	32.53
1943	1944	0.03	0.00	0.00	0.68	1.16	2.38	5.07	7.66	2.25	2.15	1.58	0.28	23.24
1944	1945	0.00	0.00	0.02	2.45	5.00	4.22	3.13	4.92	5.82	0.33	1.39	0.00	28.18
1945	1946	0.00	0.00	0.00	2.91	4.23	10.37	2.32	2.98	2.20	0.10	0.47	0.00	25.58
1946	1947	0.20	0.00	0.06	0.28	4.08	3.66	0.76	3.82	4.94	0.65	0.40	1.63	20.48
1947	1948	0.00	0.00	0.00	5.28	1.55	1.22	4.18	1.51	5.57	7.61	1.03	0.25	28.20
1948	1949	0.06	0.00	0.13	0.85	1.87	4.67	1.39	3.32	6.83	0.08	0.74	0.00	19.94
1949	1950	0.05	0.04	0.02	0.02	2.12	2.79	10.12	5.15	3.29	1.31	0.58	0.08	25.53
1950	1951	0.00	0.00	0.00	3.46	7.19	9.38	5.14	2.84	1.25	1.27	1.48	0.00	32.01
1951	1952	0.00	0.01	0.04	2.68	6.26	8.01	10.19	2.08	4.62	0.84	0.57	1.38	37.48
1952	1953	0.04	0.00	0.05	0.08	2.73	14.72	6.74	0.08	3.17	3.91	0.57	0.97	33.08
1953	1954	0.00	0.17	0.00	1.31	4.64	0.96	7.80	3.19	5.74	3.23	0.37	0.26	27.67
1954	1955	0.00	1.35	0.00	0.90	5.64	4.43	3.63	1.22	0.60	3.68	0.01	0.00	21.46
1955	1956	0.00	0.00	0.45	0.51	3.28	17.09	11.78	6.15	0.31	2.48	1.28	0.10	44.23
1956	1957	0.00	0.00	0.17	2.28	0.23	0.38	3.85	5.57	2.49	2.32	3.93	0.08	21.30
1957	1958	0.00	0.00	2.16	6.16	0.93	3.99	7.18	11.94	6.87	5.43	0.45	0.44	45.55
1958	1959	0.01	0.01	0.03	0.15	0.29	1.96	7.75	6.24	1.60	0.25	0.16	0.00	18.45
1959	1960	0.00	0.00	3.16	0.14	0.08	1.80	5.65	8.46	6.05	1.38	0.80	0.00	27.52
1960	1961	0.00	0.00	0.01	0.74	3.81	4.50	5.22	3.29	4.60	1.07	0.77	0.16	24.17
1961	1962	0.00	0.03	0.57	0.17	2.88	3.93	2.02	8.79	4.34	0.51	0.06	0.00	23.30
1962	1963	0.00	0.08	0.36	9.47	0.95	4.64	3.75	4.22	4.94	6.57	0.66	0.00	35.64
1963	1964	0.00	0.01	0.09	2.61	7.53	0.81	5.10	0.33	1.97	0.33	0.40	1.10	20.37
1964	1965	0.00	0.02	0.00	2.31	6.12	8.64	6.63	1.24	0.97	5.04	0.00	0.00	30.97
1965	1966	0.01	0.50	0.00	0.23	6.11	3.74	8.62	3.30	0.97	1.31	0.21	0.13	25.13
1966	1967	0.00	0.12	0.35	0.01	7.61	6.55	12.42	0.58	5.86	6.72	0.17	1.94	42.33

SANTA ROSA OFFICIAL STATION CHRONOLOGICAL LISTING JULY THROUGH JUNE PERIOD

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
1967	1968	0.00	0.00	0.07	0.86	2.68	4.01	7.63	4.82	4.20	0.48	0.26	0.00	25.01
1968	1969	0.00	1.68	0.02	2.07	3.39	9.09	13.25	8.23	1.79	3.23	0.03	0.04	42.62
1969	1970	0.00	0.00	0.03	2.42	1.19	11.79	15.89	2.89	3.44	0.07	0.00	0.44	38.16
1970	1971	0.00	0.00	0.00	2.24	8.97	10.78	3.13	0.19	4.05	1.22	0.24	0.05	30.87
1971	1972	0.00	0.03	0.34	0.49	2.39	5.49	1.09	3.49	1.02	1.79	0.09	0.13	17.15
1972	1973	0.05	0.11	0.66	3.47	6.87	5.12	15.38	7.17	3.48	0.65	0.03	0.00	42.99
1973	1974	0.00	0.00	0.74	2.37	13.23	5.33	6.48	3.54	6.67	2.87	0.09	0.00	41.32
1974	1975	1.61	0.00	0.00	1.27	1.20	3.80	1.98	9.88	7.84	1.71	0.02	0.10	29.41
1975	1976	0.00	0.21	0.02	6.44	1.58	0.89	0.39	2.61	0.92	2.62	0.00	0.03	15.71
1976	1977	0.00	0.78	0.66	0.46	1.76	1.15	2.01	1.93	2.65	0.23	1.43	0.00	13.06
1977	1978	0.00	0.00	1.18	0.65	0.22	5.22	9.81	7.60	5.30	2.29	0.08	0.00	40.33
1978	1979	0.00	0.00	1.38	0.00	2.45	0.41	11.74	7.12	2.74	1.38	0.80	0.00	28.02
1979	1980	0.01	0.00	0.09	4.14	5.99	7.71	7.09	8.82	1.52	2.00	0.19	0.27	37.83
1980	1981	0.00	0.00	0.00	0.38	0.50	6.98	7.81	2.60	3.58	0.20	0.63	0.00	22.68
1981	1982	0.02	0.00	0.24	2.76	8.91	11.29	8.72	5.23	6.50	4.00	0.00	0.03	47.70
1982	1983	0.00	0.00	0.97	4.30	8.44	3.61	8.39	9.88	15.74	3.48	0.92	0.00	55.66
1983	1984	0.00	0.75	0.24	1.20	11.21	11.33	0.65	2.45	2.25	1.18	0.11	0.13	31.50
1984	1985	0.00	0.17	0.09	2.36	10.92	2.60	1.87	3.01	4.61	0.20	0.04	0.02	25.89
1985	1986	0.03	0.00	1.18	1.40	4.50	3.72	6.64	15.94	5.90	0.83	0.82	0.00	40.96
1986	1987	0.00	0.00	2.75	0.55	0.20	2.65	5.01	5.45	4.83	0.16	0.08	0.01	21.69
1987	1988	0.01	0.00	0.00	1.37	4.45	6.11	6.99	0.40	0.02	1.53	0.73	0.49	22.10
1988	1989	0.00	0.00	0.00	0.11	4.89	4.07	1.47	1.53	10.22	1.22	0.13	0.22	23.86
1989	1990	0.00	0.04	2.72	2.65	1.71	0.00	5.74	3.27	2.03	0.24	5.46	0.01	23.87
1990	1991	0.00	0.00	0.27	0.62	0.44	1.16	0.75	4.72	13.74	0.33	0.13	0.72	22.88
1991	1992	0.00	0.05	0.01	1.74	1.15	2.91	2.03	9.34	4.09	4.69	0.00	0.70	27.40
MONTHLY	AVG	0.04	0.07	0.44	1.66	3.67	5.37	6.18	5.08	4.16	1.99	0.93	0.26	29.64

APPENDIX B

Biological Accounts for:

Burke's goldfields (*Lasthenia burkei*)

Sebastopol meadowfoam (*Limnanthes vinculans*)

Baker's blennosperma (*Blennosperma bakeri*)

Santa Rosa Wetland Baseline Study

Lasthenia burkei (Greene) Greene — Burke's goldfields

Family: Asteraceae

Synonymy: *Baeria fremontii* in part in Munz and Keck (1959), also referred to as *Baeria burkei* Greene

Status: Federal (FWS 1991): Endangered — State (CDFG 1988): Endangered

Description: Burke's goldfields is a small annual wildflower that grows to about 10 inches tall (occasional up to 15). It is rather slender and inconspicuous when in the vegetative state, as it typically grows in shallow pools and wet swales, and it generally has only one main stem. Its leaves are filiform or linear, 2 to 8 cm long, opposite, and mostly entire, although the lower leaves and those of plants in drier situations are often pinnately divided into small (mostly linear) spreading lobes. The lower stems are nearly glabrous while the upper are finely pubescent. The flower heads are typically numerous (although diminutive plants in dry situations often have only one) and occur on long peduncles. Robust plants frequently have more than 20 flower heads per plant. The individual flower heads are composed of a widely varying number of yellow disk flowers (from one or 2 on up to about 20) surrounded by up to 15 showy yellow ray flowers (rays to about 6 mm long). The achenes are 1 to 1.5 mm long and are very characteristic for this species in that they have only one long awn (often with additional very small scales). The involuceres are also relatively characteristic in that they are only slightly grown together at the base.

Related species include *L. glaberrima*, another vernal pool species that has very inconspicuous rays and a nearly fully fused involucre. These species are virtually identical in appearance before flowering and they often grow together.

Distribution and Range: Burke's goldfields is endemic to the central Coast Range region and has been reported historically from Mendocino, Lake, and Sonoma counties. The California Natural Diversity Data Base reports it from approximately 20 historic sites, most of which are situated in and around the city of Santa Rosa. Two interesting locations (where some morphological variation can be observed) are in Lake County, one at Manning Flat and one at the Steurmer Winery.

Habitat: This species of goldfields grows in vernal pools (typically from only a few inches up to about 20 inches deep) and occasionally in wet swales. While it can also apparently grow in mesic upland habitats (as it has at several of the translocation sites), but is presumably precluded from successful growth there by interspecific competition. It grows in a wide variety of habitats, in high density in shallow or deep natural vernal pools, in low density in seasonally wet swales and ephemeral drainageways, and has been observed growing in perched depressions with a gravel surface (Sonoma County Airport), in artificial drainage ditches, in orchards and vineyards, and even at the base of eucalyptus trees. It is able to withstand a certain level of grazing and actually appears to be favored by light to moderate horse grazing. It has also been observed growing vigorously in disked fields and cultivated cropland. The site at Shiloh road has also burned without significant observable declines.

Growth and Phenology: Burke's goldfields begins its annual growth cycle in the fall with the advent of the rainy season. It grows relatively slowly through much of the winter and early spring, often completely underwater. Plants that are exposed during the winter grow faster, but are still slender and somewhat small. With the evaporation of the pools in the spring, this species puts forth a final burst of vegetative growth and flowers as the pool bottom dries. The flowering period is quite variable depending on weather and rainfall patterns. Plants have been observed flowering as early as late March and as late as mid-June. The primary blooming period is between mid-April and mid-May. This species appears to be quite adaptable to weather patterns as it has been observed to begin flowering as the pools dry initially in early April, only to be re-flooded again with later rains in late April. Some whole colonies have been completely re-submerged by these late storms, with virtually all the plants being in full bloom. A more typical seasonal progression is one in which the vegetative plants begin to shoot up as the pool water recedes sometime in mid-winter, followed by additional shoot growth with later submergence. The result is shoots that

tend to be long and drawn out, often creeping horizontally along the muddy pool bottom, finally sending up erect flowering stems as the pool dries for the last time.

Threats and Endangerment: Burke's goldfields has suffered significant habitat losses and associated population decline because of land use conversions to agriculture, housing and roads, and general landscape alteration. It is, however, relatively tolerant of low and moderate disturbance as long as seasonally wet conditions are still available. For example, the entire Sonoma County Airport was graded and converted to runways, infields, etc. in the 1940's, at which time any pools that were present were at least completely altered and/or destroyed. Since that time, however, this site has come to support over 100,000 goldfields plants in more than 20 separate colonies. One unusual threat to many of the currently existing colonies appears to be the removal of grazing. In shallow, marginal habitats, grazing gives this species an advantage by keeping the competing grasses (*Pleuropogon, Hordeum, Lolium*) down. In several cases, where such low-to-moderate grazing has been eliminated, the goldfields have essentially disappeared as the dense grass growth (including thick dead thatch) has returned. While this species has a relatively high tolerance for light disturbance, its main threat comes from simple destruction of seasonal wetland habitat. Burke's goldfields is protected at at least 3 major locations, including the county airport and two mitigation sites, one at Alton Lane and one at the Abramson Road preserve. This species shows an excellent ability to colonize new suitable habitat and often forms dense, nearly pure stands in shallow, uniform depth pools. Continued housing development and intensified agriculture are ongoing threats, while wastewater irrigation is a newer and potentially very significant threat.

Potential for transplantation and/or reintroduction: This species has excellent potential for transplantation and reintroduction into suitable habitats. It grows quite abundantly in suitable habitats, including disturbed situations and incidentally created low places. It requires seasonal inundation (or at least saturation), but does not appear to have any soil restrictions. This species produces abundant viable seed, although it does seem to have the potential for strong dormancy. It has been grown successfully from hand seeding of seasonal wetland habitats, from shovel transplantation of live plugs, and from scraped and respread topsoil. It is relatively tolerant of light to moderate grazing and other disturbance. In natural stands it is an excellent competitor, often forming nearly pure, unbroken cover.

Limnanthes vinculans Ornduff — Sebastopol meadowfoam

Family: Limnanthaceae

Synonymy: none

Status: Federal (FWS 1991): Endangered — State (CDFG 1988): Endangered

Description: Sebastopol meadowfoam is a small winter annual wildflower that grows to about 15 inches tall (occasional up to 20). It has rather slender stems that often lean against associated vegetation (e.g., *Juncus*). It is usually multi-stemmed and forms a broad, sprawling base. Its stems often extend outward along the ground before ultimately turning upward. Its leaves are narrow, 5 to 15 cm long, alternate, and mostly few lobed. A key character is the fact that the first leaves are entire with no lobes. The later leaves are typically divided into 3 to 5 short, narrow lobes. Typically the lobes are rounded at the tips, unlike those of the closely related *L. douglasii* complex. The stems are quite glabrous and relatively delicate or even succulent in appearance. The flowers are typically numerous (although diminutive plants in dry situations often have only a few) and occur on long leafy stems. Robust plants frequently have more than 20 flowers per plant. The flowers grow singly in the leaf axles and consist of 5 white petals (12 to 18 mm long with a band of hairs near the base) within a calyx of 5 distinct sepals. The petals reflex at maturity. The nutlets are 3 to 4 mm long with small tubercles.

Distribution and Range: This meadowfoam is a highly restricted and localized endemic,

growing almost exclusively in Sonoma County, generally between Two Rock and Cotati to the south, northward to Graton and Forestville in the north. One small colony was recently discovered in Napa County. This plant was only described in the late 1960's and it probably was more abundant and perhaps more widely distributed prior to regional human settlement and development. It is currently known from about 30 sites, most of which are along the western side of the Cotati-Santa Rosa Valley. Several of the best remaining sites are located along the Laguna de Santa Rosa near Sebastopol and Cunningham. It was historically known from a number of locations in and around Santa Rosa proper, but most of these sites have been extirpated.

Habitat: This species grows in shallow-to-deep vernal pools (typically from only a few inches up to about 20 inches deep) and wet swales. It grows in a variety of habitats, but is not usually found in areas that have been extensively disturbed. It can tolerate some grazing, but appears to need the associated lushness of an undisturbed pool community to attain its best growth. It has been observed growing in shallow pools (less than 10 inches when full), but rarely reaches high densities or large size there. Its best development occurs around the edges of the better developed seasonal pools. It grows in man-made ditches at the abandoned Santa Rosa Naval Air Center and has been transplanted to artificial pools at the Alton Lane mitigation site. Some of the best populations are situated in extensive communities of *Eleocharis*, and it commonly grows together with the closely related *L. douglasii* var. *nivea.*

Growth and Phenology: This species, like most California annuals, begins growth in the fall and grows slowly over the winter, usually submerged in vernal pools or similar habitats. It grows vegetatively until March or April when the pool begins to recede. Flowering commences as the plants are exposed and pool bottoms dry. The actual period of flowering varies somewhat depending on the weather patterns. Sebastopol meadowfoam has been observed in flower as early as early April and as late as mid-June. Seed set is usually complete by early June, at which time the plants go dormant for the summer. While this species is vulnerable to widely varying weather patterns (such as unusually dry periods in mid-winter), it also can achieve exceptional growth in responses to alternating inundation and exposure.

Threats and Endangerment: This species has been significantly depleted by loss of habitat, and is still threatened at a number of sites. It is not as threatened by housing development as the other two species discussed here because its main areas of concentration are to the west of Santa Rosa. Still, there are several significant locations (e.g., Santa Rosa Air Center, Springfield) where such development is a threat, and continued intensification of the agricultural uses on rural lands also represents a serious problem. Heavy grazing is a potential problem in that livestock tend to destroy much of the overall cover, even in the wet swale habitats, resulting in no supporting vegetation for the meadowfoam to lean on, as well as simply crushing the *Limnanthes* itself. Removal of grazing is apparently not a threat as this species often escapes denser associated cover by growing upward through it.

Potential for transplantation and/or reintroduction: While there is less available data regarding the transplant potential for this species than for the other two, it, too, appears to have reasonably good possibilities. It grows in disturbed areas (the type locality) and even man-made habitats, and like many vernal pool species, it has great potential to colonize and fill suitable seasonal wetlands. It produces reasonably abundant seed (several dozen to more than 100 seeds per plant) and occurs in sites that are not especially vulnerable to weed invasion. Previous seeding efforts, however, have resulted in relatively low germination and/or success rates, and this may be related to strong seed dormancy. Like the other species discussed, its main problem is one of dwindling physical habitat. As an evolutionarily "new" species with an inherently small range, it seems to have excellent potential for expansion into new areas of suitable habitat conditions.

Blennosperma bakeri Heiser — Baker's blennosperma, Sonoma sunshine, or Baker's sticky seed

Family: Asteraceae

Synonymy: none

Status: Federal (FWS 1991): Endangered State (CDFG 1991): Endangered

Description: Baker's blennosperma is a small annual wildflower that grows to about 20 inches tall, ranging from a single erect stemmed plant to one with numerous lateral branches depending on the local growing conditions. It is generally glabrous and has leaves (to about 10 cm) that are narrow and either entire or with a few narrow lobes. The flower heads are relatively small (0.5 to 1.5 cm across), but showy, with up to 15 fertile, pale yellow ray flowers surrounding 5 to 20 (or up to even 70), sterile disk flowers. The involucre is divided and uniseriate, but with a small thin membrane between the individual phyllaries (which tend to fold over the achenes at maturity). A key character is the red stigma. The achenes are about 3 to 4 mm long, narrowly ovoid, with 4 to 6 prominent edges or angles.

Distribution and Range: Baker's blennosperma occurs in the valley terrain from Windsor in the north, to Cotati in the southwest, to Big Bend and Sonoma in the southeast.

Habitat: This species inhabits vernal pools and wet swales, ranging from moderately deep standing water (12 to 20 inches deep) to the upper edges of shallow pools. It can grow in mesic grassland, but is presumably precluded from establishing colonies there by effective interspecific competition. As a vernal pool species, it typically occurs in the shallower areas, but has been observed growing in mixed stands with *Lasthenia burkei* and other pool-bottom species. This species is relatively tolerant of certain types of disturbance, including light grazing, summer disking, and vehicular disturbance. It has been observed growing in tire ruts and two of the largest colonies have been disked repeatedly. Several sites have shown exceptional blennosperma growth after discing. At one site, a sizable population grew after having been sprayed with an herbicide.

Growth and Phenology: This species germinates and begins vegetative growth in the fall, often enduring substantial time underwater. It grows more rapidly and begins flowering as its wet habitat begins to dry in the early spring. Being a species that tends to prefer the edges of the pools, it usually flowers earlier than many of its associated species, ranging from late February to mid-May. Its primary flowering time is March to April. As with other vernal pool species, its ultimate size and maturation date depend on weather patterns. Plants in dry habitats tend to be small (less than 6 inches tall) and have few flowers per plant (1 to 6). Plants in areas that are alternately inundated and exposed, however, often reach 15 or 20 inches in height and frequently have more than 20 flowers per plant. Stem thickness also varies greatly, with depauperate individuals being only about 2 or 3 mm in diameter, while robust plants can be over 6 mm thick.

Threats and Endangerment: This species, like so many vernal pool plants, has suffered declines due to physical habitat losses. It is able to withstand a relatively great degree of disturbance, but simply has lost the space needed to grow. Agriculture and housing are the two biggest factors, although altered hydrology (diverted and/or enhanced drainage) can also be important. Given a suitable substrate with some seasonal ponding, this species is able to establish and maintain viable populations under a variety of conditions. Grazing's effect is not well known, although there are several sites where moderate grazing is apparently compatible. However, since this species tends to grow in the shallower pools and their edges, it appears to be vulnerable to grass encroachment, especially in dry years when weeds can extend their coverage.

Potential for transplantation and/or reintroduction: This species has good potential for transplantation. It can withstand substantial disturbance and has been observed growing in low wet areas that have been completely altered. It has been successfully grown at several artificial pool sites, some as very robust, productive individuals. Because of its preference for somewhat shallower sites, it is potentially adapted to a relatively wide range of habitat conditions. It also produces an abundance of seed and has shown an ability to fill in and dominate "vacant" seasonal wetland habitat (there were over 600,000 plants at one site, and more than 200,000 at another).

APPENDIX C

Plant Species Checklist

For The

Santa Rosa Plain

Compiled from:

Harrison, 1991
and
Patterson, unpubl. field data

Santa Rosa Wetland Baseline Study

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Equisetaceae	**Equisetum laevigatum**	horsetail	S
Isoetaceae	**Isoetes howellii**	Howell's quillwort	?
Marsileaceae	**Marsilea mucronata**	clover fern	?
Marsileaceae	**Pilularia americana**	American pill-wort	S
Alismaceae	**Alisma triviale**	water-plantain	C
Alismaceae	**Machaerocarpus californicus**	fringed water plantain	I
Alliaceae	**Allium unifolium**	wild onion	I
Alliaceae	**Allium vineale**	wild garlic	I
Cyperaceae	**Carex barbarae**	sedge	?
Cyperaceae	**Carex densa**	sedge	C
Cyperaceae	**Carex obnupta**	sedge	S
Cyperaceae	**Cyperus eragrostis**	umbrella sedge	C
Cyperaceae	**Eleocharis acicularis**	needle spike-rush	S
Cyperaceae	**Eleocharis palustris**	spike-rush	D
Cyperaceae	**Scirpus acutus**	bulrush	S
Cyperaceae	**Scirpus koilolepis**	tiny bulrush	?
Cyperaceae	**Scirpus microcarpus**	small-friuted bulrush	S
Hydrocharitaceae	**Elodea sp.**	elodea	r
Iridaceae	**Sisyrinchium bellum**	blue-eyed grass	C
Juncaceae	**Juncus bufonius**	toad rush	C
Juncaceae	**Juncus capitatus**	annual rush	S
Juncaceae	**Juncus effusus var. pacificus**	rush	S
Juncaceae	**Juncus mexicanus**	Mexican rush	C
Juncaceae	**Juncus oxymeris**	rush	C
Juncaceae	**Juncus patens**	spreading rush	C
Juncaceae	**Juncus phaeocephalus var. paniculatus**	brown-headed rush	C
Juncaceae	**Juncus tenuis**	slender rush	C
Juncaceae	**Juncus tenuis var. congestus**	rush	S
Lilaeaceae	**Lilaea scilloides**	flowering quill-wort	C
Liliaceae	**Brodiaea hyacinthina**	white brodiaea	S
Liliaceae	**Brodiaea laxa**	Ithuriel's spear	S
Liliaceae	**Brodiaea appendiculata**	brodiaea	r
Liliaceae	**Brodiaea elegans**	harvest brodiaea	C
Liliaceae	**Brodiaea terrestris**	ground brodiaea	?
Liliaceae	**Calochortus luteus**	yellow mariposa lily	S
Liliaceae	**Calochortus uniflorus**	pink mariposa tulip	S
Liliaceae	**Camassia quamash**	camass lily	I
Liliaceae	**Chlorogalum pomeridianum**	soap plant, amole	C
Liliaceae	**Dichelostemma congesta**	ookow	?
Liliaceae	**Dichelostemma multiflorum**	brodiaea	I
Liliaceae	**Dichelostemma pulchellum**	brodiaea, blue dicks	S
Liliaceae	**Muilla maritima**	muilla	I

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Liliaceae	Triteleia pedunculata	pale marsh brodiaea	I
Liliaceae	Zigadenus fremontii	Fremont's star lily	S
Orchidaceae	Spiranthes porrifolia	ladies' tresses	I
Poaceae	Agrostis alba	redtop	I
Poaceae	Aira caryophyllea	annual hairgrass	C
Poaceae	Alopecurus howellii	annual foxtail	S
Poaceae	Alopecurus pratensis	foxtail grass	S
Poaceae	Anthoxanthum odoratum	vernalgrass	C
Poaceae	Avena fatua	wild oat	D
Poaceae	Avena sativa	cultivated oat	C
Poaceae	Beckmannia syzigachne	slough grass	?
Poaceae	Briza maxima	rattlesnake grass	S
Poaceae	Briza minor	little quaking grass	C
Poaceae	Bromus carinatus	California brome	S
Poaceae	Bromus diandrus	ripgut	D
Poaceae	Bromus mollis	soft chess	D
Poaceae	Bromus rubens	red brome or foxtail	C
Poaceae	Bromus tectorum	cheat grass	I
Poaceae	Cynodon dactylon	Bermuda grass	C
Poaceae	Cynosurus echinatus	dogtail grass	C
Poaceae	Dactylis glomerata	orchard grass	S
Poaceae	Danthonia californica	California oatgrass	D
Poaceae	Deschampsia danthonioides	hair grass	S
Poaceae	Elymus glaucus	wild rye grass	C
Poaceae	Elymus triticoides	creeping wild rye grass	S
Poaceae	Gastridium ventricosum	nit grass	?
Poaceae	Glyceria occidentalis	western manna grass	C
Poaceae	Holcus lanatus	velvet grass	C
Poaceae	Hordeum brachyantherum	meadow barley	C
Poaceae	Hordeum hystrix	Mediterranean barley	C
Poaceae	Hordeum jubatum	foxtail barley	D
Poaceae	Hordeum leporinum	mousetail barley	C
Poaceae	Koeleria cristata (K. macrantha)	Junegrass	?
Poaceae	Lolium multiflorum	Italian ryegrass	D
Poaceae	Lolium perenne	perennial ryegrass	?
Poaceae	Panicum sp.		I
Poaceae	Paspalum dilatatum	Dallis grass	I
Poaceae	Phalaris angustata	canary grass	S
Poaceae	Phalaris aquatica (P. tuberosa)	Harding grass	C
Poaceae	Phalaris lemmonii	canary grass	S
Poaceae	Phalaris minor		C
Poaceae	Phalaris paradoxa		C

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Poaceae	Pleuropogon californicus	Calif. semaphore grass	C
Poaceae	Poa annua	annual bluegrass	C
Poaceae	Poa pratensis	Kentucky bluegrass	?
Poaceae	Polypogon maritimus		?
Poaceae	Polypogon monspeliensis	rabbit-foot grass	C
Poaceae	Sitanion jubatum	squirreltail grass	S
Poaceae	Stipa pulchra	purple needlegrass	S
Poaceae	Taeniatherum caput-medusae (Elymus c.)	Medusa-head	D
Poaceae	Vulpia dertonensis	six-weeks fescue	C
Poaceae	Vulpia myuros var. hirsuta (F. megalura)	annual fescue	C
Typhaceae	Typha angustifolia	cattail	C
Typhaceae	Typha latifolia	cattail	S
Aceraceae	Acer macrophyllum	bigleaf maple	I
Amaranthaceae	Amaranthus albus	tumbleweed	S
Anacardiaceae	Toxicodendron diversilobum	poison oak	C
Apiaceae	Ammi majus	bishop's weed	?
Apiaceae	Conium maculatum	poison hemlock	C
Apiaceae	Daucus carota	Queen Ann's lace	C
Apiaceae	Eryngium aristulatum	coyote thistle	C
Apiaceae	Eryngium armatum	coyote thistle, button celer	S
Apiaceae	Foeniculum vulgare	fennel, wild anis	C
Apiaceae	Lomatium caruifolium	caraway-leaved lomatium	S
Apiaceae	Lomatium utriculatum	hog parsnip	S
Apiaceae	Oenanthe sarmentosa	water parsley	S
Apiaceae	Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	R
Apiaceae	Perideridia kelloggii	Kellogg's yampah	S
Apiaceae	Sanicula bipinnatifida	purple sanicle	S
Apiaceae	Sanicula crassicaulis	gambelweed	S
Apiaceae	Scandix pecten-veneris	shepherd's needle	S
Apiaceae	Torilis nodosa		S
Apocynaceae	Apocynum cannabinum	Indian hemp	I
Asclepiadaceae	Asclepias fascicularis	milkweed	I
Asteraceae	Achillea millefolium var. borealis	yarrow	S
Asteraceae	Achyrachaena mollis	blow-wives	S
Asteraceae	Agoseris grandiflora	mountain dandelion	I
Asteraceae	Anthemis cotula	mayweed	C
Asteraceae	Anthemis fuscata	dusky chamomile	S
Asteraceae	Artemisia douglasiana	mugwort	S
Asteraceae	Aster chilensis	Chile aster	S
Asteraceae	Baccharis pilularis ssp. consanguinea	coyote brush	C
Asteraceae	Baccharis viminea	mule fat	I

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Asteraceae	Blennosperma bakeri	Baker's blennosperma	E
Asteraceae	Blennosperma nanum	common blennosperma	I
Asteraceae	Calendula arvensis	calendula, pot marigold	I
Asteraceae	Carduus pycnocephalus	Italian thistle	C
Asteraceae	Centaurea calcitrapa	purple star thistle	S
Asteraceae	Centaurea melitensis	star thistle, tocalote	S
Asteraceae	Centaurea solstitialis	yellow star thistle	D
Asteraceae	Cichorum intybus	chicory	C
Asteraceae	Cirsium arvense	bull thistle	C
Asteraceae	Cirsium vulgare	common thistle	C
Asteraceae	Conyza canadensis	horseweed	C
Asteraceae	Cotula coronopifolia	brass buttons	I
Asteraceae	Evax sparsiflora	evax	S
Asteraceae	Filago gallica	filago	S
Asteraceae	Gnaphalium chilense	cotton-batting plant	S
Asteraceae	Gnaphalium palustre	lowland cudweed	S
Asteraceae	Gnaphalium purpureum	purple cudweed	S
Asteraceae	Grindelia camporum	gumplant	I
Asteraceae	Hemizonia congesta (H. luzulifolia congesta)	white tarweed	I, R
Asteraceae	Hemizonia fitchii	tarweed	C
Asteraceae	Hemizonia lutescens	tarweed	C
Asteraceae	Hemizonia luzulaefolia ssp. rudis	hayfield tarweed	S
Asteraceae	Hemizonia multicaulis ssp. vernalis		I
Asteraceae	Hemizonia pungens	tarplant, spikeweed	S
Asteraceae	Holocarpha virgata	virgate tarweed	S
Asteraceae	Holozonia filipes		S
Asteraceae	Hypochoeris glabra	cat's-ear	D
Asteraceae	Hypochoeris radicata	cat's-ear	S
Asteraceae	Lactuca saligna	wild lettuce	C
Asteraceae	Lactuca serriola	prickly lettuce	C
Asteraceae	Lasthenia burkei	Burke's goldfields	E
Asteraceae	Lasthenia californica (Baeria chrysostoma)	goldfields	I
Asteraceae	Lasthenia glaberrima	smooth goldfields	C
Asteraceae	Lasthenia glabrata	goldfields	I
Asteraceae	Layia chrysanthemoides	smooth tidy tips	S
Asteraceae	Madia elegans ssp. densifolia	tarweed	S
Asteraceae	Madia sativa	common madia	S
Asteraceae	Matricaria matricarioides	pineapple weed	S
Asteraceae	Microseris douglasii	Douglas' microseris	?
Asteraceae	Microseris laciniata	cut-leaved scorzonella	?
Asteraceae	Picris echioides	ox-tongue	C
Asteraceae	Psilocarphus oregonus	Oregon woolly-heads	S

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Asteraceae	Psilocarphus tenellus var. tenellus	slender woolly-heads	S
Asteraceae	Senecio vulgaris	groundsel	C
Asteraceae	Silybum marianum	milk thistle	C
Asteraceae	Soliva daucifolia		S
Asteraceae	Soliva sessilis	common soliva	S
Asteraceae	Sonchus asper	sow thistle	C
Asteraceae	Sonchus oleraceus	sow thistle	C
Asteraceae	Taraxacum officinale	dandelion	C
Asteraceae	Tragopogon porrifolius	oyster plant	C
Asteraceae	Wyethia angustifolia	narrow-leaved mule ears	S
Asteraceae	Xanthium spinosum	spiny clotbur	C
Asteraceae	Xanthium strumarium	cocklebur	C
Boraginaceae	Amsinckia intermedia	fiddleneck	C
Boraginaceae	Myosotis laxa	forget-me-not	S
Boraginaceae	Plagiobothrys bracteatus	popcorn flower	C
Boraginaceae	Plagiobothrys fulvus var. campestris	popcorn flower	C
Boraginaceae	Plagiobothrys greenei	popcorn flower	S
Boraginaceae	Plagiobothrys nothofulvus	popcorn flower	C
Boraginaceae	Plagiobothrys stipitatus var. micranthus	popcorn flower	S
Boraginaceae	Plagiobothrys tenellus	popcorn flower	S
Boraginaceae	Plagiobothrys undulatus	popcorn flower	?
Brassicaceae	Brassica campestris	field mustard	C
Brassicaceae	Brassica nigra	black mustard	C
Brassicaceae	Capsella bursa-pastoris	shepherd's purse	C
Brassicaceae	Cardamine oligosperma	bitter cress	S
Brassicaceae	Dentaria californica	toothwort, milkmaids	S
Brassicaceae	Nasturtium officianale (Rorippa nas.-aq.)	watercress	S
Brassicaceae	Raphanus sativus	wild radish	C
Brassicaceae	Rorippa curvisiliqua	yellow-cress	S
Brassicaceae	Rorippa islandica	yellow cress	C
Brassicaceae	Sisymbrium officianale	hedge mustard	C
Brassicaceae	Teesdalia coronopifolia		?
Brassicaceae	Thysanocarpus radians	fringe-pod	S
Callitrichaceae	Callitriche longipedunculata	water starwort	C
Callitrichaceae	Callitriche marginata	water starwort	S
Campanulaceae	Downingia concolor	downingia	C
Campanulaceae	Downingia cuspidata	downingia	I
Campanulaceae	Downingia humilis	dwarf downingia	R, S
Campanulaceae	Downingia yina		r
Caryophyllaceae	Cerastium glomeratum (C. viscosum)	mouse-ear chickweed	S
Caryophyllaceae	Sagina occidentalis	western pearlwort	S
Caryophyllaceae	Silene gallica	windmill pink	C

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Caryophyllaceae	**Spergula arvensis**	spurrey	S
Caryophyllaceae	**Spergularia rubra**	red spurrey	S
Caryophyllaceae	**Stellaria media**	chickweed	C
Caryophyllaceae	**Stellaria nitens**	chickweed	C
Chenopodiaceae	**Atriplex patula ssp. hastata**	fat-hen	S
Chenopodiaceae	**Chenopodium album**	lamb's quarters	S
Convolvulaceae	**Calystegia subacaulis**	stemless morning-glory	?
Convolvulaceae	**Convolvulus arvensis**	morning-glory, bindweed	D
Crassulaceae	**Crassula aquatica (Tillaea a.)**	water pygmy-weed	S
Crassulaceae	**Crassula erecta (Tillaea e.)**	sand pygmy-weed	S
Cucurbitaceae	**Marah fabaceus var. agrestis**	wild cucumber	S
Cuscutaceae	**Cuscuta howelliana**	Howell's dodder	r
Dipsacaceae	**Dipsacus fullonum**	teasel	C
Elatinaceae	**Elatine californica**	California waterwort	?
Elatinaceae	**Elatine heterandra**	waterwort	?
Euphorbiaceae	**Eremocarpus setigerus**	dove weed, turkey mullein	C
Euphorbiaceae	**Euphorbia serpyllifolia**	thyme-leaved spurge	S
Fabaceae	**Lathyrus cicera**	pea	?
Fabaceae	**Lathyrus hirsutus**	hairy pea	S
Fabaceae	**Lathyrus jepsonii ssp. californicus**	Jepson's wild pea	?
Fabaceae	**Lathyrus odoratus**	sweet pea	S
Fabaceae	**Lotus corniculatus**	bird's foot trefoil	C
Fabaceae	**Lotus micranthus**	bird's foot trefoil	S
Fabaceae	**Lotus purshianus**	Spanish clover	C
Fabaceae	**Lupinus bicolor ssp. pipersmithii**	bicolor lupine	C
Fabaceae	**Lupinus densiflorus var. palustris**	lupine	?
Fabaceae	**Lupinus formosus**	pale summer lupine	?
Fabaceae	**Lupinus nanus var. latifolius**	sky lupine	C
Fabaceae	**Lupinus polycarpus**	dove lupine	?
Fabaceae	**Medicago polymorpha var. brevispina**	bur-clover	C
Fabaceae	**Melilotus albus**	white sweet-clover	C
Fabaceae	**Melilotus indicus**	yellow sweet-clover	C
Fabaceae	**Melilotus officianalis**	alfalfa	S
Fabaceae	**Trifolium agrarium**	hop clover	S
Fabaceae	**Trifolium amplectens**	pale sac clover	C
Fabaceae	**Trifolium appendiculatum**	long-keeled clover	S
Fabaceae	**Trifolium barbigerum**	bearded clover	S
Fabaceae	**Trifolium bifidum**	pinole clover	S
Fabaceae	**Trifolium ciliolatum**	tree clover	S
Fabaceae	**Trifolium depauperatum**	clover	C
Fabaceae	**Trifolium dubium**	shamrock	C
Fabaceae	**Trifolium fucatum**	sour clover	C

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Fabaceae	Trifolium gracilentum	pin-point clover	S
Fabaceae	Trifolium grayi	Gray's clover	S
Fabaceae	Trifolium hirtum	rose clover	C
Fabaceae	Trifolium incarnatum	crimson clover	S
Fabaceae	Trifolium microcephalum	maiden clover	S
Fabaceae	Trifolium microdon	Valparaiso clover	S
Fabaceae	Trifolium pratense	red clover	S
Fabaceae	Trifolium repens	white clover	C
Fabaceae	Trifolium subterraneum	sub-clover	C
Fabaceae	Trifolium tridentatum	tomcat clover	C
Fabaceae	Trifolium variegatum	white-tip clover	C
Fabaceae	Vicia benghalensis	vetch	C
Fabaceae	Vicia pannonica	vetch	S
Fabaceae	Vicia sativa var. angustifolia	narrow-leaved vetch	C
Fabaceae	Vicia sativa var. sativa	spring vetch	C
Fabaceae	Vicia villosa	purple vetch	C
Fagaceae	Quercus agrifolia	coast live oak	C
Fagaceae	Quercus douglasii	blue oak	S
Fagaceae	Quercus garryana	Oregon white oak	I
Fagaceae	Quercus kelloggii	California black oak	S
Fagaceae	Quercus lobata	valley oak	C, D
Fagaceae	Quercus wislizenii	live oak	I
Gentianaceae	Centaurium floribundum	canchalagua	S
Gentianaceae	Centaurium trichanthum	centaury	S
Gentianaceae	Microcala quadrangularis		S
Geraniaceae	Erodium brachycarpum (E. obtusiplic.)	filaree	C
Geraniaceae	Erodium cicutarium	cut-leaf filaree	C
Geraniaceae	Erodium moschatum	white-stemmed filaree	C
Geraniaceae	Geranium dissectum	cut-leaf geranium	C
Geraniaceae	Geranium molle	wild geranium	C
Hydrophyllaceae	Nemophila menziesii	baby blue-eyes	S
Hydrophyllaceae	Nemophila menziesii ssp. atomaria	white nemophila	S
Hypericaceae	Hypericum perforatum	Klamath weed	I
Lamiaceae	Lamium amplexicaule	henbit	S
Lamiaceae	Lamium purpureum	red henbit	S
Lamiaceae	Mentha pulegium	common mint, pennyroyal	C
Lamiaceae	Pogogyne douglasii ssp. parviflora	Douglas' pogogyne	R
Lamiaceae	Stachys ajugoides	hedge-nettle	?
Lamiaceae	Stachys rigida ssp. quercitorum	hedge-nettle	S
Lamiaceae	Trichostema lanceolatum	vinegar weed	S
Limnanthaceae	Limnanthes alba	white meadowfoam	S
Limnanthaceae	Limnanthes douglasii var. douglasii	common meadowfoam	S

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Limnanthaceae	Limnanthes douglasii var. nivea	snowy meadowfoam	C
Limnanthaceae	Limnanthes vinculans	Sebastopol meadowfoam	E
Linaceae	Linum bienne	blue flax	S
Lythraceae	Ammannia coccinea		?
Lythraceae	Lythrum hyssopifolia	loosestrife	C
Malvaceae	Malva nicaeensis	bull mallow, cheeseweed	S
Malvaceae	Malva rotundifolia	round-leaved mallow	C
Malvaceae	Malvella leprosa (Sida hederacea)	alkali mallow	C
Malvaceae	Sidalcea calycosa	annual sidalcea	S
Malvaceae	Sidalcea diploscypha	annual checker	?
Malvaceae	Sidalcea malvaeflora	checkerbloom	C
Onagraceae	Boisduvalia densiflora	boisduvalia	S
Onagraceae	Boisduvalia glabella	boisduvalia	S
Onagraceae	Boisduvalia stricta	boisduvalia	S
Onagraceae	Camissonia ovata (Oenothera o.)	sun cups	C
Onagraceae	Clarkia purpurea ssp. quadrivulnera	clarkia, wine cup	C
Onagraceae	Epilobium paniculatum	willow-herb	C
Onagraceae	Epilobium watsonii var. franciscanum	willow herb	S
Papaveraceae	Eschscholzia californica	California poppy	C
Papaveraceae	Platystemon californicus	cream cups	S
Plantaginaceae	Plantago erecta	California plantain	S
Plantaginaceae	Plantago lanceolata	English plantain	D
Polemoniaceae	Navarretia bakeri (N. leucocephala bakeri)	Baker's navarretia	R
Polemoniaceae	Navarretia cotulaefolia	yellow navarretia	?
Polemoniaceae	Navarretia intertexta	needle-leaved navarretia	C
Polemoniaceae	Navarretia plieantha (N. leucocephala p.)	many-flowered navarretia	R
Polemoniaceae	Navarretia squarrosa	skunkweed	S
Polemoniaceae	Navarretia tagetina	marigold navarretia	?
Polemoniaceae	Navarretia viscidula	viscid navarretia	?
Polygonaceae	Polygonum aviculare	knotweed	C
Polygonaceae	Rumex acetosella	sheep sorrel	D
Polygonaceae	Rumex conglomeratus	clustered dock	C
Polygonaceae	Rumex crispus	curly dock	C
Polygonaceae	Rumex fueginus	golden dock	?
Polygonaceae	Rumex pulcher	fiddle dock	?
Polygonaceae	Rumex salicifolius	willow-leaved dock	?
Portulacaceae	Calandrinia ciliata var. menziesii	red maids	C
Portulacaceae	Claytonia hallii	Hall's montia	?
Portulacaceae	Claytonia perfoliata	miner's lettuce	C
Portulacaceae	Montia fontana (M. verna or hallii ?)	Hall's montia	?
Primulaceae	Anagallis arvensis	scarlet pimpernel	C
Primulaceae	Anagallis minima	chaffweed	?

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Ranunculaceae	**Delphinium variegatum**	larkspur	?
Ranunculaceae	**Ranunculus alismaefolius**	buttercup	S
Ranunculaceae	**Ranunculus aquatilis var. hispidulus**	aquatic buttercup	?
Ranunculaceae	**Ranunculus arvensis**	spiny buttercup	S
Ranunculaceae	**Ranunculus californicus**	California buttercup	C
Ranunculaceae	**Ranunculus lobbii**	aquatic buttercup	R
Ranunculaceae	**Ranunculus muricatus**	buttercup	C
Ranunculaceae	**Ranunculus orthorhynchus var. bloomeri**	Bloomer's buttercup	?
Ranunculaceae	**Ranunculus pusillus**	buttercup	S
Rosaceae	**Acaena californica**	acaena	S
Rosaceae	**Rosa californica**	California wild rose	S
Rosaceae	**Rosa eglanteria**	sweet-brier	I
Rosaceae	**Rubus discolor (R. procerus)**	Himalayan blackberry	C
Rosaceae	**Rubus vitifolius**	California blackberry	S
Rubiaceae	**Galium aparine**	bedstraw	S
Rubiaceae	**Galium divaricatum**	bedstraw	?
Rubiaceae	**Sherardia arvensis**	field madder	S
Salicaceae	**Salix lasiolepis**	arroyo willow	C
Saxifragaceae	**Lithophragma affinis**	woodland star	?
Scrophulariaceae	**Bellardia trixago**	bellardia	I
Scrophulariaceae	**Collinsia heterophylla**	chinese houses	S
Scrophulariaceae	**Collinsia sparsiflora var. arvensis**	collinsia	?
Scrophulariaceae	**Gratiola ebracteata**	hedge hyssop	S
Scrophulariaceae	**Kickxia elatine**	fluellin	S
Scrophulariaceae	**Limosella aquatica**	mudwort	?
Scrophulariaceae	**Mimulus guttatus ssp. guttatus**	monkey-flower	S
Scrophulariaceae	**Mimulus tricolor**	ditch monkeyflower	S
Scrophulariaceae	**Orthocarpus attenuatus**	owl's clover, valley tassels	S
Scrophulariaceae	**Orthocarpus campestris**	field owl's clover	?
Scrophulariaceae	**Orthocarpus castillejoides**	paintbrush owl's-clover	?
Scrophulariaceae	**Orthocarpus densiflorus**	pink owl's clover	?
Scrophulariaceae	**Orthocarpus erianthus**	butter-and-eggs	?
Scrophulariaceae	**Orthocarpus faucibarbatus**	owl's clover	D
Scrophulariaceae	**Orthocarpus lithospermoides**	cream sacs	S
Scrophulariaceae	**Orthocarpus purpurascens**	purple owl's clover	S
Scrophulariaceae	**Orthocarpus pusillus**	dwarf owl's clover	S
Scrophulariaceae	**Parentucellia viscosa**	hawksbill, parentucellia	C
Scrophulariaceae	**Scrophularia californica ssp. floribunda**	bee plant	S
Scrophulariaceae	**Verbascum blattaria**	mullein	S
Scrophulariaceae	**Verbascum thapsis**	mullein	S
Scrophulariaceae	**Veronica anagallis-aquatica**	brooklime	C
Scrophulariaceae	**Veronica peregrina ssp. xalapensis**	speedwell	C

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

Appendix C. Plant species checklist, Santa Rosa Plain, Sonoma County

Family	PLANT SPECIES	COMMON NAME	Abund.
Urtaceae	Urtica dioca ssp. gracile var. holosericea	stinging nettle	S
Verbenaceae	Lippia nodiflora	garden lippia	S
Zygophyllaceae	Tribulus terrestris	puncture vine	S

Abundance:

D = dominant; C = common, generally widespread; S = scattered; I = infrequent; r = rare in study area, but not listed; R = rare, listed by CNPS or CDFG; E = federally listed as Endangered

Source: unpubl. field data, Patterson, 1984-94; N. Harrison 1978 '91

APPENDIX D

Lists Of Sites With Rare Plants

On The

Santa Rosa Plain

Compiled from:
Patterson, Guggolz, and Waaland, 1994
(Attachment 1)

The lists on the following pages represent the most significant sites that are known to or have historically supported sensitive plants. There are four separate lists, one each for the three species of primary concern: Burke's goldfields (*Lasthenia burkei* - LABU), Sebastopol meadowfoam (*Limnanthes vinculans* - LIVI), and Baker's blennosperma (*Blennosperma bakeri* - BLBA), plus a fourth list of ensemble sites. Data for the listed sites may be out of date, and there may be other sites not yet discovered that belong here. In general, each list starts with the sites that are already in public ownership (or with a conservation easement), followed by the most significant privately owned sites, the sites with potential for significant resources (but whose current resource status is not known), and sites known to be essentially destroyed or extirpated. A small number of sites for each species are not included due to their small size or very small populations.

Santa Rosa Wetland Baseline Study

KEY

For

Appendix D

(Lists D1 through D4)

*1	Map Code	County (1990) air photo # + sequential # (continued from Waaland, 1989)
*2	A.P. No.s	Sonoma County Assessor's Parcel number(s)
*3	EO No.	Element Occurrence number with CNDDB (# - Species)
*4	Place Name	General location name or description
*5	Geog. Sub-	**W**: Windsor, **L**: Laguna, **U**: urban Santa Rosa (SR), **S**: SW SR, **N**: NW SR, **E**: E SR, **P**: S SR Plain; **R**: rural SR, **C**: Cotati
*6	Site size	Approx. acreage of site (multiple values indicate more than one parcel)
*7	LABU	*Lasthenia burkei*: **E**: extant, **X**: extirp., **H**: hist./abund. class: **'0'**: none, **0**: <10 plants, **1**: 10-100, **2**: 100-500, **3**: 500-1000, **4**: 1000-5000, **5**: 5000-10,000, **6**: 10,000-100,000, **7**: > 100,000 / year
*8	LIVI	*Limnanthes vinculans*; (see # 7 for codes)
*9	BLBA	*Blennosperma bakeri*; (see # 7 for codes)
*10	Other R/E	Other sensitive spp: **NAPL**: *Navarretia pleiantha*, **NABA**: *N. bakeri*, **ALAES**: *Alopecurus aequalis sonomensis*; **DOHU**: *Downingia humilis*, **RALO** : *Ranunculus lobbii*; **PODOP**: *Pogogyne douglasii* ssp. *parviflora*, **PEGAG**: *Perideridia gairdneri* ssp. *gairdneri*, **HECO**: *Hemizonia congesta*, **Q**: *Quercus lobata*; (__): hist.
*11	Sens. Wild.	**CTS**: CA tiger salamander, **LO**: CA linderiella, **VPS**: v. p. shrimp, **FS** freshwater shrimp, **R**: raptors, **W**: waterbirds, etc., **Ai**: sig. aquatic invert.s, **Aa**: amphibians; (__): potential habitat; < >: sought, not found
*12	Habitats	Habitats: **V/v**: sig./minor vernal pools, **S/s**: swales, **R/r**: riparian, **P/p**: peren. marsh, **M/m_**: meadow (_w: wet, _d: dry), **C/c**: creek, **D/d**: ditch / flood channel, **A/a**: farmed wetlands, **F/f**: floodplain, **W/w**: other wetlands, **N/n**: man-made pond, **U_**: other significant upland habitats (**Ug**: native grassland, **Uw**: wildflowers, **Uo**: oak woodland, **Us**: oak savanna); (__): historic; "__" = man-made habitat
*13	Current Use	A = Agriculture (**Aw**: wastewater, **Ao**: orchard, **Ap**: pasture, **Ar**: row crops, **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield); R = Residential (**Rr**: rural, **Ru**: urban); V = Vacant; P = Public (**Pc**: conservation, **Pr**: recreation, park, **Ps**: school, **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utility); C / I: commercial/industrial

Sites are listed in generally descending order of significance.

List D1: most significant LABU sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
	Sites In Public Ownership/ Easement											
20E 01	059-260-010	7-LABU	Sonoma County Airport, preserve	W	11 ?	E/6-7/84;87-89;E/?/90-93			PODOP?		"V", "v", "s", Ug, Uw	Pc
20F 01	059-260-10	9-LABU	Sonoma County Airport, medians	W	15+	E/6/87 E/4/88					"s","w"	Pu, airport infield
20F 10	059-260-010	9-LABU	Sonoma County Airport, south end	W	2	E/6/84 E/6/87 E/6/88					"v"	Pu
26B 03	034-042-77		Alton Lane mitigation site	R	29	?/0/88 E/5/89 E/6/90-94	E/1/93 E/1/94	E/4/88 E/7/89-94	DOHU, RALO, PODOP	LO	"V", "v", S, s, v, md, Uo,	Pc
26D 02	130-223-81	17-LABU	Hall Rd/ Piezzi,SE; (Crinella)	R	4.0	E/4/88 E/6/91 E/6/92 E/3/94	E/1/91 E/1/92 E/1/94		RALO, Q.		s, S, v, Us	Pc pending
26B 29	034-101-70		Abramson Rd NW; Bainbridge (preserve)	R	8	E/4/92			RALO		S, s, V, v, "v", Uo	Pc, Ap
26F 09	060-060-53	1-LABU 4-BLBA 19-LIVI	Todd Road Preserve	L	75	E/1/74, 87;5/88 H/0/90, 91,94	E/?/79, 80;E/3-6/83,87 88,90	E/3/88 E/4/90 E/3/94	PEGAG? RALO		S, s, V, v, Us, Ug, Mw	Pc
20F 04	059-270-60	8-LABU in part	Airport Business Center (Coombs)	W	2	X/4/84 E/4/87 E/4/88 E/5/89		E/2/91 E/2/92 E/3/93	(NAPL/ 87), PODOP, DOHU		"v"	Pc
26B 31			Alton Lane South	R	6?	-/-/89 E/1/92 E/4/93		-/-/89 E/2/93	PODOP		S, "s", "v"	Pc
26B 24	034-021-22	19-LABU	Pioneer 2000	N	0.2	E/4/88; 0/90,93 1/91,94 2/92					v	Ru
	Sites Presumed Extant; Private											
26B 40	034-022-03		NWSR Annex; Stipinovich	N	5.22	E/6/88, 90,92, 93, E/4/91		E/5-6/ 88, 90-93	RALO		V, s, Uw, Ug	Rr, Ap
26B 43	034-021-34		Pinercrest Rd/Waltzer, NE (Toso)	N	9.60	E/6/88 E/7/89 E/5/93 E/6/94					s, v	Rr, Ap

List D1: most significant LABU sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26F 10	060-060-55	4-LABU 5-LIVI 12-BLBA	Dom. Carinalli easement	L		E/5/88 E/5/90	E/6/88	E/1/74 E/0/86			s, V, v, p, Us, F, W	A
26B 33	034-030-70	[illegible]	(Jacobsen)	N	28.49	E/3/88 E/5/90 E/1/92		E/2/88 H/0/90 H/0/92	RALO		S, s, V, v, mw, Uw	Af, Ap, Rr
20C 07	066-021-01		Herb Rd.; blue oaks; Promenade Lane	W	3.96	E/5/89 E/4/90			NABA, DOHU		v, s, Uo	V
26B 38	034-022-02		NWSR Annex (Craigie & Johnson)	N	5.22	E/3/88 E/?/90 E/1/91 E/3/92,					s, v, Ug	Rr, V
20F 07	164-150-24	9-NAPL	Sanders Rd. W; (Gossage)	W	7.39	E/5/84 E/3-4/ 86,88, 92,?/93			NAPL		s, v, c, r	Rr, Ap
26B 44	036-01-46 036-01-49		Piner at Marlow (Crane/ Avellar)	N	7.64	E/2/90 E/4/91 E/4/93			RALO		s, v	Ap, Rr
20F 08	164-150-21	8-LABU in part	Sanders Rd. E; (Hall)	W	10	E/4-6/ 84-88 E/3/92 E/2/93			NAPL, NABA, Trifol grayi		v, s	Rr, Ap, Ai, Ac
26B 51	036-01-41		Piner Rd. w/ eucalyptus	N	10.41	E/3/89 E/6/90 E/3/91 E/4/93			NABA, RALO, Q.		s, v, d	V
20C 01	161-030-16	18-LABU	Grill	W	4.57	E/4/86 E/2/90 E/3/92 E/2/93			PODOP		V, v, s, Ug, Uw, Ug	C/I, V
20C 08	066-190-26		Grange area	W	13	E/5/84E /3/88					v, s, Ug, Us	
20C 06	066-010-02		Wilcox Rd.	W	5.09	E/4/88 E/4/91					v, s, Us	Rr
26B 18	034-030-71		Francisco elbow	N	3.84	E/2/88 E/4/92		E/3/88 E/5/92	RALO		v, s, Ug	Rr, Af, Ap
20C 04	161-040-07	12-LABU	Starr Rd. No. 2	W	5.87	E/3/88 E/3/91					v, s, Ug	Rr
26B 19	059-070-61		Raplee Terrace	N		E/?/?		?/88	RALO		v, s	Rr, V

List D1: most significant LABU sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26B 56	057-030-36		Skaug's horse pasture	R	16.11	E/3/90					v, s, Uo, Ug	Ao, Ap, Rr
26B 55	059-030-10		Wood Road at Fulton, NW	R	29.24	E/3/90					v	Ap
26A 01	057-080-26	2-LABU	Denner Ranch	L	364.58	E/?/69 E/?/74 H/?/87			PODOP		S, s, v, R, r, Pm, C	Ap, Ah
26B 25	034-050-26		Wood Road elbow NW	R	4.95	E/4/88 E/?/90					v, s	Ap
	Extirpated or Largely Destroyed											
26B 22	034-023-01 034-023-02 ? 034-023-03		San Miguel Road; (Manes)	N	8.94	E/6/88 E/5/89 H/0/94					s, v	Rr
20F 05	59-271-26 59-271-27	10-LABU in part	Shiloh Rd horse ranch	W	37.5	E/6/84 -88 E/1/92 E/1/94			NABA/H, PODOP		v, V, s, Us, c	Af, Ap
20F 13	164-150-13 164-150-14		N Skylane; Munderloh	W		E/6/84 E/?/91 E/0/92 ?/0/93					s, (v)	Rr, Ap
26B 06c	034-060-12	[illegible]-LABU 15-BLBA	Comalli N; NE corner of Simi parcel	R	1.0 (119.63)	E/?/88 E/5/91 X?/94		E/?/88 E/6/91	RALO		(s, v)	Av
20F 02	59-271-28 59-271-17		Standard Structures NE	W	1.19 78.2 44.07	E/5/88 X/0/92					s, d, a, w	C/I , V
26B 28	034-101-69		Abramson Road No. 4 (Bainbridge east)	R	4.26	E/5/88 E/3/89 X/0/91-93			(NABA), HECO, Q.		s, (v), (Ug)	Rr
20F 14	164-150-16		Skylane Business Park	W	5.8	E/4/91 E/4/92 E/3/93 E/1/94			DOHU, Trifol. grayi		v, s, d	V, Ap
20F 17	59-271-13		Piombo W. central	W	51.81	E/4/84 (air) E/?/91 X/0/93					w indust.	C/I
20F 32	59-271-28		Standard Structures south	W	78.25	E/4/89 E/4/92					s, v	V, C/I

List D1: most significant LABU sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
20C 11	subdivided		Kidd Estates	W		E/7/86 E/7/89 X/90			(DOHU, CUHO?)		V, v, s, Us	Ru
26B 02	originally 034-021-17 034-021-32 subdivided		San Miguel Rancho	N	(58)	E/4/88 E/4/89 E/4/90 X/92		E/5/88 E/5/89 E/3/90 X/-/92	(RALO)		(s, V, v)	Ru
26B 14	originally 034-023-14 subdivided		TMB Brown Subdivision	N	10.83	E/4/88 E/3/89 X/93		E/2/88 E/2/89 X/-/93	(RALO) (PODOP)		(v, d, w)	Ru
20C 03	161-26-02 (sudivided)	12-LABU	Starr Road No. 1; (ZAM)	W	12.98	E/4/88 E/3/89 X/90						Ru
26B 16	034-023-16		San Miguel Est. No. 2 north	N	3.33	E/5/88 E/5/89 X/93		E/2/88 X/-/93	(RALO)		(w)	Af, Rr
26B 15	subdivided	0-BLBA 20-LABU	San Miguel Rd; San Miguel Est. No. 1	N	7.96	E/4/86, 89; H/0/91 X/92-93		E/5-7/ 78-90 E/2/91 X/93	(RALO)		(V, S, v, s)	Ru

List D2: most significant LIVI sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
	Sites in Public Ownership/ Easement											
26F 09	060-060-53	1-LABU 4-BLBA 19-LIVI	Todd Road Preserve	L	75	E/1/74, 87;5/88 H/0/90, 91,94	E/4-6/ 79,80, 83,87, 88,90	E/3/88 E/4/90 E/3/94	PEGAG? RALO		S, s, V, v, Us, Ug, Mw	Pc
26F 22	035-141-03		'FEMA'	S	61		E/4/90 E/5/93		PODOP, RALO, Q.	CTS, LO	S, V, v, w	V
26F 14	035-211-23		Broadmoor Acres North	S	14		E/4/88 E/4/91 E/3/92 E/1/93		RALO, PODOP, Q.	CTS	s, v, V,Ug, Us, m	Pc
26F 10	060-060-55	4-LABU 5-LIVI 12-BLBA	Dom. Carinalli easement	L		E/5/88 E/5/90	E/6/88	E/1/74 E?/0/86			s, V, v, p, Us, F, W	A
26D 02	130-223-81	17-LABU	Hall Rd/ Piezzi,SE; (Crinella)	R	4.0	E/4/88 E/6/91 E/6/92 E/3/94	E/1/91 E/1/92 E/1/94		RALO, Q.		s, S, v, Us	Pc pending
27E 13	035-191-06 035-191-09 035-191-10		Northpoint Village	S	9.0		E/2-4/ 90-94		PODOP, RALO, Q.	LO	s, v, V, d	Ap
26F 11	060-010-15 060-010-16		Hofbauer easement, Laguna	L			E/2/88				F, p, v, s, Ug, Us	A
26B 03	034-042-77		Alton Lane mitigation site	R	29	?/0?/88 E/5/89 E/6/90-94	E/1/93 E/1/94	E/4?/88 E/7/89-94	DOHU, RALO, PODOP	LO	"V", "v", S, s, v, md, Uo,	Pc
	Sites Presumed Extant; Private											
26D 03	035-051-23 035-051-14		Hall/ Occidental/ Fulton ('Cramer')	R	174	E/2/88 E/3/91-93	E/6-7/ 88, 91-94		NABA, PODOP, RALO, HECO,	CTS	S, s, V, v, d, md, Us, Ug	Ap
26F 17	134-051-12 134-051-13 134-051-09		('Beretta')	R	90.46 318.5 4.13		E/6/88 E/6/93	E/6/88 E/6/93	RALO		S, s, V, v, Us, Uo	Rr, Ap, Ai, Af
26F 04	035-082-11	8-LIVI	Naval Air Station; ('Madera')	S	35	E/2/93	E/?/79 E/?/80 E/4/90-92,		RALO, Q. PODOP	CTS	S, s, V, v, Md, Us, Uw	V
32B 01	062-240-33	15-LIVI 2-ALAES	Llano Rd. at Laguna; ('Gundel-finger')	L	1.60 57		E/5/79 E/?/88 E/6/92		ALAES hist., RALO		s, v, R, r, M, C, Sp, p	Rr, Ap

List D2: most significant LIVI sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26F 18	134-051-08 134-051-15		('Heskett')	R	21 16		E/6/?	E/5/?	PODOP, RALO, DOHU		S, s, V, Us, Uo	
26F 02	035-141-21	8-LIVI	Naval Air Station W; swale N of Madera	S	246		E/4-6/ 79,80, 83,84, 89-94		RALO		"S", "v", R, r, p, Ug, c	V
26F 01	134-051-24	11-LIVI	Todd Road near Llano	R	53		E/5/83 E/5/88				V, s, Us, Ug	C/I, Ap
26D 06	035-141-13	2-LIVI	Finley at Wright	S			E/3-4/ 86,88, 90-94		RALO	CTS	v, Us	V
26F 23	035-211-19		Broadmoor Acres South	S	13		E/?/89 E/3/91 E/4/92 E/4/93				s, v, d	V
26F 06	060-070-23	1-LIVI 8-BLBA	Todd Road 'elbow'	L	22		E/?/77, 80,86 E/3/88, 92,94	E/6/86 E/4/88 E/2/90 E/5/94	RALO		S, s, v, mw, c	Ac
	Sites with Status Unknown											
26F 08	060-060-48	10-LIVI	Laguna at RR bridge; Sebastopol campground	L		E/1/88	E/?/74, 77,79, 80, 83 E/1/88				R, F, s, v, p, Us, Uo	Af, Ai
26F 16	134-151-26		Colgan Cr. pasture near Todd	P			E/2/88				S, s, v	
26F 21			Brown Farm	L			E/2/92 E/3/93?				s, v, Us	
27E 03	045-011-03	4-LIVI 17-BLBA	Scenic at Whistler	P			E/?/75 83;E/ 1-3/86, 88,90	E/1/88 E/1/90	RALO		s, v, Us	V, A
26F 13	134-232-13		Walker Road near Colgan Creek	P	16		E/4/84 E/3/88		RALO		s, v?	Ap
26F 19	063-150-24		Glade Farm	L	16.40		E/3/92				s, R, Us	A
26D 04	035-042-10	3-LIVI	Lion's Memorial; Occidental @ Merced	R	17		E/2/79 E/?/80 E/3/83 E/5/88		PODOP, RALO, Q.		s, v, Us	A

List D2: most significant LIVI sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26E	060-060-55 060-060-57 060-060-58	6-LIVI 7-BLBA	Carinalli's east end duck pond	L	172	E/2/86 E/2/90	E/?/85 E/4/86	E/4/83 E/3/85 E/2/86 E/5/88			s, v, p	A
26C 04	060-330-27 060-336-25 060-330-26	9-LIVI	H. S. Rd; Laguna at Occidental Road	L	18 4.0 58.49	E/1/79 H/0/81 H/0/88	E/1/79 E/1/81 E/1/88		PODOP, RALO, Q.		s, V, R, r, Us, f	Ap
27E 29	134-225-14		Primrose Ave.	P	2		E/4/93				s, v?, Ug	Rr
26F 07	060-060-30	19-LIVI	Todd Road at Llano, SW	L	30.9		E/2/88				S, s, v, Us	Ap
26F 12	035-182-01	5-LIVI	Pyle/Kirby, E of S. Wright	S	4 3 4		E/?/80		PODOP?		Us, w	V
26F 30	134-232-20 ?		'Benkelman' on Colgan Creek	R	4 ?		E/?/?					
26F 34	134-051-25 134-051-26		'Hale'	R	81 34		E/?/79	E/?/79			S, s, v	Ap
	Extirpated or Largely Destroyed											
26F 20			Mills Farm	R			E/6/? X?/?/93 ?				S, V, v, Us	A
26F 25	035-201-45 035-201-46 035-201-47		Fisher, south of Pyle	S	2.24 2.25 3.92		E/?/83	E/?/83	PODOP		s, v	Rr
33A 12	144-050-02 144-050-03 46-286-03 46-286-07		Bennett Properties - Cotati	C	30		0/88-91 E/1/92 E/1/93		RALO		S, s, v, V	V
26F 26	35-201-06; 07; 12; 13		Between Pyle/Ludwig ('Spring-field')	S	20		E/5-6/92, 93; X/94?		RALO	CTS	s, d	Rr
27E 04	045-022-20	12-LIVI 8-BLBA	Horn Ave. north, near Santa Rosa Ave.	E			E/7/80, 83;H/0/88;X/89,90	E/?/77? E/7/80, 83;			(s, v)	V
27E 05	045-041-26	3-LIVI 18-BLBA	Horn Ave. south, near Santa Rosa Ave.	E			E/?/74 E/5/79 X/88, 90				(s, v)	V, A

List D3: most significant BLBA sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
	Sites in Public Ownership/ Easement											
26F 09	060-060-53	1-LABU 4-BLBA 19-LIVI	Todd Road Preserve	L	75	E/1/74, 87;5/88 H/0/90, 91,94	E/4-6/ 79,80, 83,87, 88,90	E/3/88 E/4/90 E/3/94	PEGAG? RALO		S, s, V, v, Us, Ug, Mw	Pc
26F 10	060-060-55	14-LABU 25-LIVI 12-BLBA	Dom. Carinalli easement	L		E/5/88 E/5/90	E/6/88	E/1/74 E?/0/86			s, V, v, p, Us, F, W	A
26B 03	034-042-77		Alton Lane mitigation site	R	29	?/0?/88 E/5/89 E/6/90-94	E/1/93 E/1/94	E/4?/88 E/7/89-94	DOHU, RALO, PODOP	LO	"V", "v", S, s, v, md, Uo,	Pc
26B 31			Alton Lane South	R	6?	-/-/89 E/1/92 E/4/93		-/-/89 E/2/93	PODOP		S, "s", "v"	Pc
26B 06b	034-060-12	21-LABU 15-BLBA	Simi easement (fronts on Piner Rd)	R	0.5	E/2/88 E/2/90 E/2/91		E/6/86 E/2/90 E/2/91			v, s	Pp
20F 04	059-270-60	8-LABU in part	Airport Business Center (Coombs)	W	2	X/4/84 E/4-6/ 87-94		E/2/91 E/2/92 E/3/93	(NAPL/ 87), PODOP, DOHU		"v"	Pc
	Sites Presumed Extant; Private											
33A 01	045-033-44		200 Scenic	P			E/?/93	E/6/93 E/6/94?			S, s, v, V	Ap
26B 58 ıd 26D 05	157-020-03 157-020-08	21-BLBA	'Corrie' (off Guernevillı Road)	R	33			E/6/88 E/7/89 E/7/90 E/7/92	Q.		S, s, V, v, Uw	Af
26B 20	157-020-09 157-020-01		Hemmerle/ Pitzel; S of Piner H.S.	R	37.92			E/6/88			S, s, V, v, r, Uo, Us	V
26B 40	034-022-03		NWSR Annex; Stipinovich	N	5.22	E/6/88, 90,92, 93, E/4/91		E/5-6/ 88, 90-93	RALO		V, s, Uw, Ug	Rr, Ap
26F 17	134-051-12 134-051-13 134-051-09		('Beretta')	R	90.46 318.5 4.13		E/6/88 E/6/93	E/6/88 E/6/93	RALO		S, s, V, v, Us, Uo	Rr, Ap, Ai, Af
26B 10	034-101-16		Abramson Road No. 2 (Piner H.S. area)	R	10			E/6/88 E/6/90			S, s, v	Ap

List D3: most significant BLBA sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26B 30	059-040-04		Bertolone - Wood Road	R	21.27			E/4/93	RALO, DOHU		V, S, s	Rr, Ap
26B 32	034-042-68		Alton Lane E (man-made ditch)	R	3.05	E/2+/91 -93		E/6/91 E/6/92 E/6/93			D	Rr
26B 26	034-091-27	9-BLBA	Piner @ Fulton, SW; SE Piner School	R	12.81			E/5/86 E/4/88 E/4/89-94			s, v, Ug, Us	V
26B 34	034-030-67		'Morrison Homes' WNW ('Ramon')	N	19.59			E/3/88, E/0/91 E/5/92 E/1/93	RALO		S, s, v, w	Rr, Ap, Af
26F 06	060-070-23	1-LIVI 8-BLBA	Todd Road 'elbow'	L	22		E/?/77, 80,86 E/3/88, 92,94	E/6/86 E/4/88 E/2/90 E/5/94	RALO		S, s, v, mw, c	Ac
26B 33	034-030-70		(Jacobsen)	N	28.49	E/3/88 E/5/90 E/1/92		E/2/88 H/0/90 H/0/92	RALO		S, s, V, v, mw, Uw	Af, Ap, Rr
26B 18	034-030-71		Francisco elbow	N	3.84	E/2/88 E/4/92		E/3/88 E/5/92	RALO		v, s, Ug	Rr, Af, Ap
26B 11	034-101-15		Abramson Road No. 3 (Piner H.S. area)	R	7			E/5/88 E/5/90	-		S, s, v	Ap, Rr
26B 37	034-030-65	-	NW Annexation area ('Cia')	N	9.67			E/2/88 E/3/90 E/3/92 E/3/93	RALO		s, v	Ah, Rr
26B 27	034-091-18	19-BLBA	SW of Piner @ Fulton/ Imwalle	R	49.35			E/4/88	DOHU		S, s, v, Ug	Ap, Av
26B 01	034-041-13		San Miguel at Fulton, NE	N	8.74	E/1/88 H/0/90 H/0/91 E/1/92		E/2/88 H/0/90 H/0/91 E/2/92	RALO		s, v	Rr
	Sites with Status Unknown											
26B 06a	034-060-11	15-BLBA in part	Comalli West (oak woodland)	R				H/?/90				Rr, V
26B 19	059-070-61		Raplee Terrace	N		E/?/?		?/88	RALO		v, s	Rr, V

List D3: most significant BLBA sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
27E 01	134-162-09		Primrose Ave., SW SR	P				E/5/88			v	Ap
27E 02	134-171-02	17-BLBA	Todd Road at Primrose	P				E/3/88 E/0/90			s, v	Ap, V
27E 03	045-011-03	14-LIVI 17-BLBA	Scenic at Whistler	P			E/?/75 83;E/ 1-3/86, 88,90	E/1/88 E/1/90	RALO		s, v, Us	V, A
27E 06	134-222-01		Scenic and Hargrave	E				E/5/88			s, v	Ap
26F 18	134-051-08 134-051-15		('Heskett')	R	21 16		E/6/?	E/5/?	PODOP, RALO, DOHU		S, s, V, Us, Uo	
26B 06c	034-060-12	21-LABU 15-BLBA	Comalli N; extreme NE corner of Simi	R	1.0 (119. 63)	E/?/88 E/5/91 X?/94		E/?/88 E/6/91 X?/94	RALO		(s, v)	Av
26B 72	054-120-14	6-BLBA	Wood Road Elbow (northeast corner)	R	1.61			H/?/77 H/0/86, 88			v	Rr
26B 08	034-290-19		Oak farm/Frazee	R	1.95			E/2/88			v, Uo, Us	Rr
26B 12	034-091-39		Paradise Lane # 1 (Jinks)	R	15			E/3/88 E/4/90 E/3/92	RALO		S, s, (v)	Rr, Ac
26E	060-060-55 060-060-57 060-060-58	6-LIVI 7-BLBA	Carinalli's east end duck pond	L	172	E/2/86 E/2/90	E/?/85 E/4/86	E/4/83 E/3/85 E/2/86 E/5/88			s, v, p	A
26B 35	034-030-72		'Morrison Homes' South ('Matter')	N	28.83	?/0/88 E/0/93		?/0/88 E/3/90 H/0/91 E/0/92	RALO	LO	s, v, d, Uw	Rr, Ap
26B 13	034-091-12		Paradise Lane # 2	R	3.39			E/2/88 E/2/90			v, s	Rr
26B 47	034-022-04		NWSR Annex. 'Deas'	N	3.58			E/2/90			s, v	Rr
26B 09	034-080-41 034-81-56 034-81-58		Santa Rosa scenic easement 224	R	49.10			E/6/88			V,v, S, s, Us, Ug	Ap

List D3: most significant BLBA sites

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26B 05	034-050-12 034-050-14		Maccario's oaks (Piner Rd west)	R	50			E/4/88	-		v, s, Uo, Ug	Ap, Af
26B 04	034-05-10		Hartman Road near Piner Road west	R	69.66	E/1/88 E?/-/90		E/4/88 E?/-/90			V, S, v, s, Uo	Ap, Af
26B 07	034-081-33	13-LABU 11-BLBA	Abramson Road No. 1 (Piner H.S. area)	R	8.18	E/?/82 H/0/88		E/2/88 E/2/90	PODOP		s, v	Rr, Av
26F 34	134-051-25 134-051-26		'Hale'	R	81 34		E/?/79	E/?/79			S, s, v	Ap
	Extirpated or Largely Destroyed											
26F 25	035-201-45 035-201-46 035-201-47		Fisher, south of Pyle	S	2.24 2.25 3.92		E/?/83	E/?/83 X/92?	PODOP		s, v	Rr
27E 04	045-022-20	12-LIVI 8-BLBA	Horn Ave. north, near Santa Rosa Ave.	E			E/7/80, 83;H/0/88;X/89,90	E/?/77? E/7/80, 83;X/88 89,90			(s, v)	V
26B 21	034-021-29 now subdivided		Rancho San Miguel No. 2	N	(2+)			E/2/88 X/92			(s, v)	Ru
26B 02	originally 034-021-17 034-021-32 subdivided		San Miguel Rancho	N	(58)	E/4/88 E/4/89 E/4/90 X/92		E/5/88 E/5/89 E/3/90 X/92	(RALO)		(s, V, v)	Ru
26B 14	originally 034-023-14 subdivided		TMB Browm Subdivisior	N	10.83	E/4/88 E/3/89 X/93		E/2/88 E/2/89 X/93	(RALO) (PODOP)		(v, d, w)	Ru
26B 16	034-023-16 subdivided		San Miguel Est. No. 2 north	N	3.33	E/5/88 E/5/89 X/93		E/2/88 X/93	RALO		(w)	Af, Rr
26B 15	subdivided	10-BLBA 20-LABU	San Miguel Rd; San Miguel Est. No. 1	N	7.96	E/4/86, 89; H/0/91 X/92-93		E/5-7/78-90 E/2/91 X/93	RALO		(V, S, v, s)	Ru

List D4: ensemble rare plant sites, Santa Rosa Plain

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
	LABU, LIVI, & BLBA All Together											
26F 10	060-060-55	14-LABU 25-LIVI 12-BLBA	Dom. Carinalli easement	L		E/5/88 E/5/90	E/6/88	E/1/74 E?/0/86			s, V, v, p, Us, F, W	A/E
26F 09	060-060-53	1-LABU 4-BLBA 19-LIVI	Todd Road Preserve	L	75	E/1/74, 87;5/88 H/0/90, 91,94	E/4-6/ 79,80, 83,87, 88,90	E/3/88 E/4/90 E/3/94	PEGAG? RALO		S, s, V, v, Us, Ug, Mw	Pc
26E	060-060-55 060-060-57 060-060-58	6-LIVI 7-BLBA	Carinalli's east end duck pond	L	172	E/2/86 E/2/90	E/?/85 E/4/86	E/4/83 E/3/85 E/2/86 E/5/88			s, v, p	A/E
26B 03	034-042-77		Alton Lane mitigation site	R	29	?/0?/88 E/5/89 E/6/90-94	E/1/93 E/1/94	E/4?/88 E/7/89-94	DOHU, RALO, PODOP	LO	"V", "v", S, s, v, md, Uo,	Pc
	LABU and LIVI Together											
26D 03	035-051-23 035-051-14		Hall/ Occidental/ Fulton (Cramer)	R	174	E/2/88 E/3/91-93	E/6-7/ 88, 91-94		NABA, PODOP, RALO, HECO,	CTS	S, s, V, v, d, md, Us, Ug	Ap
26D 02	130-223-81	17-LABU	Hall Rd/ Piezzi,SE; (Crinella)	R	4.0	E/4/88 E/6/91 E/6/92 E/3/94	E/1/91 E/1/92 E/1/94		RALO, Q.		s, S, v, Us	Pc pending
26C 03	130-250-36	14-LABU	Occidental Road horse pasture	L		E/3/86 E/2/88	E/?/86				s, v, Us	Ap
26F 08	060-060-48	10-LIVI	Laguna at RR bridge; Sebastopol campground	L		E/1/88	E/?/74, 77,79, 80, 83 E/1/88				R, F, s, v, p, Us, Uo	Af, Ai
26C 04	060-330-27 060-336-25 060-330-26	9-LIVI	H. S. Rd; Laguna at Occidental Road	L	18 4.0 58.49	E/1/79 H/0/81 H/0/88	E/1/79 E/1/81 E/1/88		PODOP, RALO, Q.		s, V, R, r, Us, f	Ap
26F 04	035-082-11	8-LIVI	Naval Air Station; (Madera)	S	35	E/2/93	E/?/79 E/?/80 E/4/90-92;6/93		RALO, Q. PODOP	CTS	S, s, V, v, Md, Us, Uw	V
	LIVI and BLBA Together											
26F 17	134-051-12 134-051-13 134-051-09		(Beretta)	R	90.46 318.5 4.13		E/6/88 E/6/93	E/6/88 E/6/93	RALO		S, s, V, v, Us, Uo	Rr, Ap, Ai, Af

List D4: ensemble rare plant sites, Santa Rosa Plain

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
33A 01	045-033-44		200 Scenic	P			E/?/93	E/6/93 E/6/94?			S, s, v, V	Ap
26F 06	060-070-23	1-LIVI 8-BLBA	Todd Road 'elbow' (LIVI type)	L	22		E/?/77, 80,86 E/3/88, 92,94	E/6/86 E/4/88 E/2/90 E/5/94	RALO		S, s, v, mw, c	Ac
27E 03	045-011-03	4-LIVI 17-BLBA	Scenic at Whistler	P			E/?/75 83;E/ 1-3/86, 88,90	E/1/88 E/1/90	RALO		s, v, Us	V, A
26F 34	134-051-25 134-051-26		(Hale)	R	81 34		E/?/79	E/?/79			S, s, v	Ap
26F 18	134-051-08 134-051-15		(Heskett)	R	21 16		E/6/?	E/5/?	PODOP, RALO, DOHU		S, s, V, Us, Uo	
27E 04	045-022-20	12-LIVI 8-BLBA	Horn Ave. north, near Santa Rosa Ave.	E			E/7/80, 83;H/0 /88;X/ 89,90	E/?/77? E/7/80, 83;X/88 89,90			(s, v)	V
26F 25	035-201-45 035-201-46 035-201-47		South of Pyle (Fisher?)	S	2.24 2.25 3.92		E/?/83	E/?/83 X/92?	PODOP		s, v	Rr
	LABU and BLBA Together											
26B 40	034-022-03		NWSR Annex; Stipinovich	N	5.22	E/6/88, 90,92-94, E/4/91		E/5-6/ 88, 90-93	RALO		V, s, Uw, Ug	Rr, Ap
26B 18	034-030-71		Francisco elbow	N	3.84	E/2/88 E/4/92		E/3/88 E/5/92	RALO		v, s, Ug	Rr, Af, Ap
26B 33	034-030-70		(Jacobsen)	N	28.49	E/3/88 E/5/90 E/1/92		E/2/88 H/0/90 H/0/92	RALO		S, s, V, v, mw, Uw	Af, Ap, Rr
26B 32	034-042-68		Alton Lane E (man-made ditch)	R	3.05	E/2+/91 -93		E/6/91 E/6/92 E/6/93			D	Rr
26B 19	059-070-61		Raplee Terrace	N		E/?/?		?/88	RALO		v, s	Rr, V
26B 01	034-041-13		San Miguel at Fulton, NE	N	8.74	E/1/88 H/0/90 H/0/91 E/1/92		E/2/88 H/0/90 H/0/91 E/2/92	RALO		s, v	Rr

List D4: ensemble rare plant sites, Santa Rosa Plain

Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Site Size (ac)	LABU	LIVI	BLBA	Other Rare Plants	Sens. Wildlife	Habitats Present	Current Land Use
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13
26B 06b	034-060-12	21-LABU 15-BLBA	Simi easement (fronts on Piner Rd)	R	0.5	E/2/88 E/2/90 E/2/91		E/6/86 E/2/90 E/2/91			v, s	Pp
26B 31			Alton Ln S (TMD Brown mitig. site)	R	6?	-/-/89 E/1/92 E/4/93		-/-/89 E/2/93	PODOP		S, "s", "v"	Pc
26B 35	034-030-72		'Morrison Homes' South (Matter)	N	28.83	?/0/88 E/0/93		?/0/88 E/3/90 H/0/91 E/0/92	RALO	LO	s, v, d, Uw	Rr, Ap
26B 04	034-05-10		Hartman Road near Piner Road west	R	69.66	E/1/88 E?/-/90		E/4/88 E?/-/90			V, S, v, s, Uo	Ap, Af
26B 07	034-081-33	3-LABU 11-BLBA	Abramson Road No. 1 (Piner H.S. area)	R	8.18	E/?/82 H/0/88		E/2/88 E/2/90	PODOP		s, v	Rr, Av
20F 04	059-270-60	8-LABU in part	Airport Business Center (Coombs)	W	2	X/4/84 E/4/87 E/4/88 E/5/89		E/2/91 E/2/92 E/3/93	(NAPL/ 87), PODOP, DOHU		"v"	Pc
26B 06c	034-060-12	21-LABU 15-BLBA	Comalli N; extreme NE corner of Simi	R	1.0 (119.63)	E/?/88 E/5/91 X?/94		E/?/88 E/6/91 X?/94	RALO		(s, v)	Av
26B 02	originally 034-021-17 034-021-32 subdivided		San Miguel Rancho	N	(58)	E/4/88 E/4/89 E/4/90 X/92		E/5/88 E/5/89 E/3/90 X/92	(RALO)		(s, V, v)	Ru
26B 14	originally 034-023-14 subdivided		TMB Brown Subdivision	N	10.83	E/4/88 E/3/89 X/93		E/2/88 E/2/89 X/93	(RALO) (PODOP)		(v, d, w)	Ru
26B 16	034-023-16		San Miguel Est. No. 2 north	N	3.33	E/5/88 E/5/89 X/93		E/2/88 X/93	RALO		(w)	Af, Rr
26B 15	subdivided	10-BLBA 20-LABU	San Miguel Rd; San Miguel Est. No. 1	N	7.96	E/4/86, 89; H/0/91 X/92-93		E/5-7/ 78-90 E/2/91 X/93	RALO		(V, S, v, s)	Ru

ATTACHMENT 1

Inventory of Rare Plant Locations and Sites Surveyed for Wetland Resources on the Santa Rosa Plain, Sonoma County

Prepared for:

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California Department of Fish and Game
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DFG Contract No. FG 2241R3

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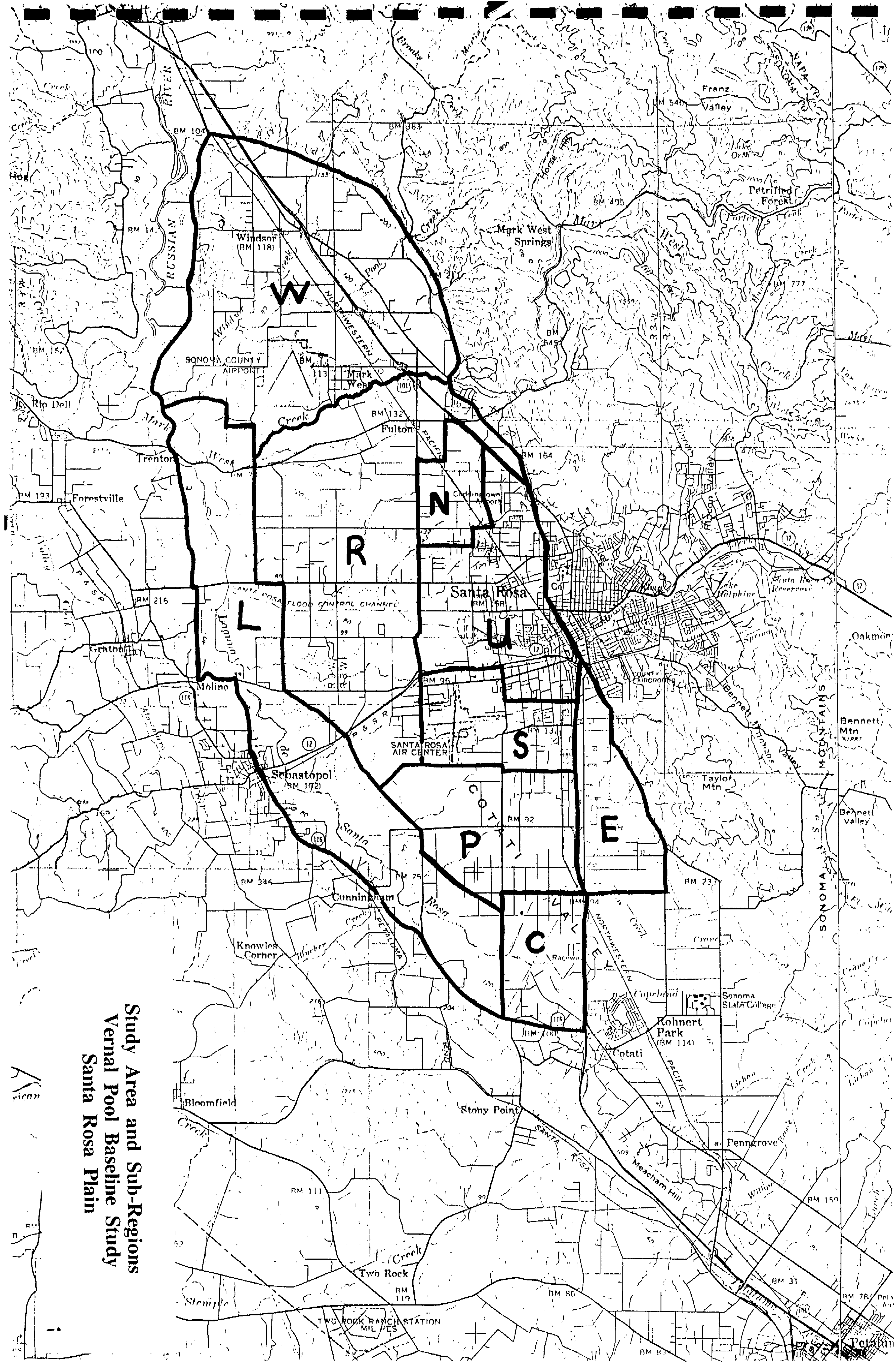
U.S. Fish and Wildlife Service
(EP 92 IV-1)

June 30, 1994



Study Area and Sub-Regions
Vernal Pool Baseline Study
Santa Rosa Plain

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20C 01	161-030-16	18-LABU	'Grill'	W	Grill		M1	4.57	2	C/I, V	C/I	C/I	HvC	P, s	C	0	H/79, 82; G/85-88, 90, 91; P/88-93;	D	H/JC; G/UC, JC	P
20C 02	not applicable	4-LABU	Arata at Hwy 101	W	Caltrans		freeway ROW	?	0	Pu	-	C/I, Rr	HvC	P	C	0	?			
20C 03	161-26-02 (sudivided)	12-LABU	Starr Road No. 1 (ZAM)	W	misc. (subdivided)		R1-PF	12.98	0	Ru	-	Ru, Rr	HvC	P	C	0	G/86, H/88, P/89	R	SB/89	
20C 04	161-040-07	12-LABU	Starr Road No. 2	W	Burbank Housing Dev. Corp. (Cole, J. and A.)		R2	5.87	0	Rr	Ru	Rr, Ru	HvC	P, s	C	0	G/88, 91	R	G/UC	
20C 05	066-010-03		Wilcox Rd. wrecking yard	W	Elliff, Elmer and Marsha		RR-B5	1.93	2	Rr	Rr, Ru	Rr, C/I	HvC	s, P	C	0	G/86-88, 91	R		
20C 06	066-010-02		Wilcox Rd.	W	Garcia, Jose and Julia		RR-B5	5.09	2	Rr	Rr, Ru	Rr, Ru, C/I	HvC	s, P	C	0	G/86-88, 91	R		
20C 07	066-021-01		Herb Road ('blue oaks') or Promenade Lane	W	Glasgow, Harold and Ellen	-	RR-B5	3.96	1	V	Rr or Ru?; for sale '94	Rr, Ap, Ai	HvC	P, s	C	0	P/89; G/86-88, 90,91; H/89	R	G/UC'90, H/JC'89	G/86
20C 08	066-190-26		Grange area	W	Rebich, Daniel P.O. Box 71, Windsor		A1-B5; 5 ac min.	13	2			Rr, Ru, A	HtC	s, P, f	C		R/?; P/84 (air); G?/88	R		P/84 (air)
20C 10	161-020-06 161-020-08 161-020-09		Veale	W	Veale	-	M1	2.5	2	V, C/I	C/I	V, C/I	HvC	s, P	C	0	P/90-94; G/90	D, R	G	P
20C 11	subdivided		Kidd Estates	W	misc.				2	Ru	Ru	Rr, Ru	HvC	P, s	C	0	P/89; G/86, 91	D	G/UC'90	P

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
V, v, s, Ug, UwUg	a	H, V, f	0.75	2	30/2	E/4/86 E/2/90 E/3/92 E/2/93	0	0		PODOP	Juncus, PODOP, Hordeum, Lolium, Wyethia, Down. con., Pleuro. cal., Brod. hyac., Hemiz.			D	H, f, C/I	H
	X					E/?/60 E/?/79 X/0/85										0?
	X	Ru				E/4/88 E/3/89 X/90										0
v, s, Ug	n	Rr, Ru, h, t, w	0.3?	1	?/3	E/3/88 E/3/91								D	Ru, t, w, h	L
v, s, Us	A	W, Rr	0.02	0	?/1	E/2/88 E/2/91	-	-							Ru, H	L
v, s, Us	a	Rr, Zc	0.6?	2	1	E/4/88 E/4/91?	-	-							Ru, Rr, Z	M
v, s, Uo	N	Rr, v	0.3	1	30/4	E/5/89 E/4/90	-	-	NABA	DOHU	Hordeum, Juncus, Downingia concolor; Quercus douglasii			D	Rr, Ru	N
v, s, Ug, Us	n	Zh			?/2?	E/5?/84 E/3/88					Quercus				Rr, A?	H?
v, s, md, Ug	a	j, v, d	0.3	2	20/2	0/0/89 E/2/90 E/2/91 E/1/92 E/1/93	-	-		HECO	Hordeum, Lolium, Hemizonia, Vulpia, Microcala, Brod. hyac.			D	C/I	M
V, v, s, Us	X	Ru				E/7/86 E/7/89 X/90	-	-		DOHU, CUHO?	Pleuro., Down., Brod., Grat., Deschamp.	P/89		D		0

*1 Map Code Co photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s Sonoma County Assessor's Parcel number(s)
*3 EO No. Element Occurrence number with CNDDB (# - Species)
*4 Place Name General location name or description
*5 Geog. Sub- W: Windsor, L: Laguna, U: urban Santa Rosa (SR), S SW SR, N: NW SR, E: E SR, P: S SR Plain, R: rural SR, C: Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen Plan ; _/Co = county, _/Cl = city
*9 Site size Approx. acreage of site (generally one parcel)
*10 Contig with Contig. with other significant parcels? 0 = isolated, no other significant sites adjacent, 1: undeveloped land adj., but no sig. wetlands; 2: 1-3 adj. or < 20 ac sig. adj. land; 3: 4 or > sig. adj. parcels or >20 ac sig. adj. land, 4: >10 ac sig. adj. public land
*11 Current Use A = Agriculture Aw: wastewater Ao: orchard Ap: pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr: rural Ru: urban, V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utility C / I: commercial/industrial
*12 Prop. Use Proposed or likely future land use(s). (see # 11)
*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system: S/s: major / minor surface system, G/g: groundwater, P/p: perched water table, F/f: floodplain
*16 Restr. Layer Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss: compacted surface layer); B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. C: casual, fence, airplane; R: reconnaissance; D: detailed (EIR, etc.); P_: Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna) (__): historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_ grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features: 1: solitary, 2: 2-5, 3: 6-15, 4: >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1. 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats, L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s	n	Z, j, W, T		0?	0/1										Ru, G	
s, md, d, a	n	Z, d, C, j, W,	1 - 2	2	0/2	-	-	-		-	Lol., Hord., Rumex, Poa ann., Brass., Geran.				Rr, I, Af, C	?
V, s	n	Zs, Zc, C, m, T	(0.5)	0	60/2	-	-	-		-	Pleuro. cal., Down. con., Desch. danth., Plagio. brac., Hord. hys., Lol.			D	I, Z, Af, Rr, C, m, T	M
S, s, v, Us	N	Zh, Zs, I, m, W	(0.8)	0	30/2	-	-	-	-	-	Ran. mur., Poa ann., Lol., Rumex, Lythrum, Mentha			D	I, z, Rr, m, W, t	H
s	n	D, C, W, T	t r	-							Lol., Hord. hys., Ran. mur., Down. con., Rumex				Ah, Rr, C, T	?
s	a	D, Z, W, T, I?	t r	0		-	-	-			Lol., Hord., Bromus, Erod., Brass., Centaur.			D	Af, Rr, Ai, C, W, T, M	?
s, r, c, d	n, A	Z, D, m, W, t	0.2		80/2	-	-	-		-	Poa ann., Rumex, Rubus disc., Vinca, Salix, Fraxinus			C, M, D	Rr, Z, Ai	?
s, v	a	Pr, R	0.1			-	-	-	-	Q	Q. kell., Q. ag., Q. doug., Q. garr. annual grasses					L
s, v	A	W, Rr	0.1	0	?/1	E/86-88 ?/0/91									Ru, C/I	L
	a	(Z), Af, R	0 C			-	-	-	-	-	Lolium, Hypoch., Vicia, Hord.	M/92		D		

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*6 Owner — Owner of site
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*8 Zoning — Zoning/Gen Plan ; _/Co = county, _/CI = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig with — Contig. with other significant parcels? 0 = isolated, no other significant sites adjacent; 1: undeveloped land adj., but no sig. wetlands, 2: 1-3 adj. or < 20 ac sig. adj. land, 3: 4 or > sig. adj. parcels or >20 ac sig. adj. land; 4: >10 ac sig. adj. public land
*11 Current Use — A = Agriculture Aw: wastewater Ao: orchard Ap: pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield. R = Residential Rr: rural Ru: urban. V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utility C / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses — Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils — Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system: S/s: major / minor surface system, G/g: groundwater, P/p: perched water table, F/f: floodplain
*16 Restr. Layer — Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss: compacted surface layer), B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other).
*17 Watershed — 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. — Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Orndulf, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. — C: casual, fence, airplane, R: reconnaissance; D: detailed (EIR, etc.); P_: Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — N: natural topog., ± unaltered (n: with minor alterations); A. hist. sig. altered (a. sig. altered, but stabile); X: completely graded/converted
*24 Influences — Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet, 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. — % aquatic/no. of features: 1: solitary, 2: 2-5, 3: 6-15, 4: >15
*28 LABU — *Lasthenia burkei*: E: extant, X: extirp., H. hist./abund. class. '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary — DOHU: *Downingia humilis*, RALO: *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., AI: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20C 23	161-030-06		Starr Road NW	W	Hoppe, Oswald and L.			2.97		V	?	C/I, Rr	HvC	s, P	C	0	P/93	R		
20C 24	164-030-15 164-030-17 164-030-18 164-030-19 164-030-20 164-030-39		Windsor Water District - '1751'	W	Windsor Water District			5.65	0	Rr, V	Pp ?	Pp, Rr	HtC	s, P	C	0	P/93	D		
20D 01	161-010-15		'Hognestadt'	W	Hognestadt (Gallagher ?)			40.51	1	Af, Rr	?	Rr, Af, Ap	HtA	s	?	1	P/93	R		
20D 02	161-010-13		Beer	W	Beer, Alan and Frieda			20	1	Rr, Af, Ag	?	Rr, Af, Ap	HtA	s, d	?	1	p/93	R		
20D 03 and 20C 18	066-100-52		Windsor Square	W	Windsor Square Investors			12.45	0	V	C/I	Ru, C/I	HvC, CoA	s, P	C	0	P/91	D		
20D 04	164-020-20		Calton Homes	W	Calton Homes		R2 B6; 8 du	21.75	0	V	Ru	Rr, Ru, C/I	HtA	s, P, f	C	2	S/92, 93; P/93	D		
20D 05			Elsbree mitigation easement	W				2	0	Pp	Pp	Ru, Rr	YsA	s	?	0	P/92, 93	D		P
20D 06	161-070-55		Brooks Road West	W	Brooks Creek Partners?			29	0	V	Ru, C/I	Ru, C/I	CoA	s	?		P/93	R		
20D 07	misc.		'North Trunk Sewer' (Windsor Creek)	W	misc.				2	V		Rr, C/I					P/93	D		
20E 01	059-260-010	7-LABU	Sonoma County Airport, preserve	W	County of Sonoma		A1	11 ?	1	Pc	Pc	C/I, Ai, Af	HwB	s, P	C	0	P/84, 87, 88, 89; S/89-93	D		P, S?

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v?, md	n	Rr, C/I, (Z)	1+?	1	?/1						Danth., Lol., Hord.			D	Ru, C/I	?
s, v, md, w	n	Af, R, h	1 ?	1	50/2	-	-	-	-	RALO	Pleuro. cal., Down. con., Las. glab., Eryng. arist., Deschamp., Limn. doug. nv., Lol.			D	Rr, Pp, Pi?	H?
s, c, Uo	N	Zh, I, M, W, T	t r	0	0/2	-	-	-		-	annual grassland, Poa ann., Rubus			D	Rr, Af, Ap, Ai, W, T, M	?
s	n	Zs, m, w, t	t r	0	0/2	-	-	-		-	Lol., Bromus, Poa ann.			D	Rr, Af, Ap, W	?
v, s	a	W	(0.4)	0	40/2	-	-	-		-	Cyperus, Mentha, Plagio. brac., Xanthium, Hord. hys., Lasth. glab.			D	Ru, C/I, j	?
v, s, C, c, Ug, Us, R	N	(Z), Rr	0.7 C	1	75/2	-	-	-	-	PODOP, RALO	Danth., Hord. brachy., Limn. doug., Rumex, Mentha	S?	LO	D, C, B	Ru, Rr	H
	A	Ru, W	0.2	2	90/2	-	-	-						D	W, j, Ru	N
C	A	(Ao), w, t	0	0	-						Lol., Bromus, Vicia, Brass., Phalaris			D	Ru	?
C, R	a, N		0			-	-	-								L/N
"V", "v", "s", Ug, Uw	A	G, H, O, Pi	0.8	3	60/3	E/6/84 E/6/87-88; E/7/89; E/?/90-93	-	-		PODOP	Juncus, Pleuro. cal., Down. con., Koelaria, Lyth., Crass. aq.	S?			C/I, Ai	N

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*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H. hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
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*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., AI: sig. aquatic invert s, Aa: amphibians; (__): potential habitat; < >: sought, not found
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Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
* 1	* 2	* 3	* 4	* 5	* 6	* 7	* 8	* 9	* 10	* 11	* 12	* 13	* 14	* 15	* 16	* 17	* 18	* 19	* 20	* 21
20E 02	066-230-40 066-230-42		Circle 'C' Ranch	W	Christensen			10	2	Ap	Ai?	Ap	HtC	s, P		1	P/92	D		
20E 03			West of Airport	W					1	Rr, Ap		Rr, Ap	HtC	s, P?		1	P93	C		
20E 04			Confluence of Windsor and Pool creeks	W					3	Rr, Ap, Ai	?	Rr, Ap, Ai	HtC, ZaA, AeA	S, s, P	?	2	P/91?	D		
20E 05			Pond 'S'	W					1	V		A	GdE	s		2	P/91	D		
20F 01	059-260-10	9-LABU	Sonoma County Airport, medians	W	County of Sonoma		A1	15+	0	Pu (airport infields)	-	Rr, Af, Ai	HwB, CfA	s, P	C	0, 1	P/87, 88; S/89-93	D		P, S?
20F 02	59-271-28 59-271-17		Standard Structures NE	W	R. C. Calletti		M1	1.19 78.25 44.07	2	C/I , V	C/I	Ap, Ah, C/I	HwB	P, s	C	1	P/84 (air), P/92; G/88, 90	D		P
20F 03	059-270-60	8-LABU in part	County Wastewater Plant	W	County of Sonoma		A1 - B6 - F2		1	Pp	Pp	Pp, Ai, Af, Ap	HuB	P	C	?				
20F 04	059-270-60	8-LABU in part	Airport Business Center (Coombs) easement	W	County of Sonoma		Pp	2?	0	Pc		Pp, C/I	HuB	s, P	C	0	P/86-93	D		P
20F 05	59-271-26 59-271-27	10-LABU in part	'Shiloh Road horse ranch'	W	Walczuk ('Vicini' ?)		A1 - B7 - F2	37.5	0	Af, Ap	Ru, C/I ?	Rr, A, V	HwB, CfA	s, P	C	2	P/84, 88-93; G/86, 88; W/88	R, D	G	P (air), G
20F 06	163-26-01 163-26-09	10-LABU in part	Shiloh Center ('Heller Labs')	W	Kenedy, Robert 1370 Fulton Rd., Santa Rosa, 95403		M1	24.1	2	V, C/I	C/I	Rr, Ru, C/I	HwB	s, P	C	1	P/84, 93	D		P

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v, md, Uo	n	Z, I, Rr	0.2	0	60/1	-	-	-	-	RALO	Poa ann., Eryng. arist., Mentha, Lotus corn., Plagio. bract., Down. con., Hord. hys.			D	Ai	L
s, mw	n	Z, R	0.5?	0	?/1										Ai?	?
C, R, c, s, Uo, (v, mw)	n	Z, D, I, C, m, T	?			-	-	-	-	Q.	Lolium, Avena ... + Pleuro., Mentha, Juncus, Carex			D, M, C	Ai, C	?
c, Uo, Ug	N			0	0/2	-	-	-	-	Q.	annual grasses and oak woodland				Ai?, Pp?	N
"s","w"	A	t	?	?	10/3	E/6/87 E/4/88	-	-	-	-	Koelaria, Hypoch., Erod., Lyth., LABU, Poa ann., Medic.				C/I, Ai	N
s, d, a, w	A	w, t, j, A	(0.8)	0	10/2	E/5/88 X?/0/92	-	-			Hord. hys., Lol., Hypoch., Erod., Mentha (+ Lashtenia chrysostoma!)				C/I, Af, I, t	M
X	X					E/?/84? H/0/88 X/?/89										0
"v"	A	T, h	0.3	2	90/5	X/4/84 E/4/87 E/4/88 E/5/89 E/6/90	-	E/2/91 E/2/92 E/3/93	(NAPL/87)	PODOP, DOHU	Pleuro, Mentha, Plagio. bract., Eryngium arist.	P/88-92			t, o	N
v, V, s, Us, c	A, g	Gh, D	3+?	hist: 2 current: 1	hist: 50/2; current: 5/1	E/6/84 E/6/86 E/6/88 E/1/92 E/1/94	-	-	NABA/H	PODOP					Ru, C/I, Ah, Ac?	H
-	A	F, H, V, w	0 C	-	-	E/?/84 X/0/88	-	-			annual weeds, Hordeum, Hypoch,.Anag., Picris			D	C/I	L

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*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system S/s: major / minor surface system, G/g. groundwater,P/p: perched water table, F/f: floodplain
*16 Restr. Layer Restrictive soil layer ? S_ dense surface clay (Se: entire profile = clay, Ss: compacted surface layer); B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Orndulf, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. C: casual, fence, airplane; R: reconnaissance; D: detailed (EIR, etc.); P_: Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet , 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features: 1: solitary, 2: 2-5, 3: 6-15, 4: >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g* , HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., AI: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20F 07	164-150-24	9-NAPL	Gossage property (Sanders Road)	W	Gossage, Maude		A1 B5 (20 ac min.)	7.39	2	Rr, Ap		Rr, Ap, Af	HuB	s, P	C	0	P/84, 89, 92, 93; G/86; W/88	R	G / CAS (NAPL)	P
20F 08	164-150-21	8-LABU in part	Hall property (Sanders Road)	W	Hall, Allen and Darian		A1 B5 (20 ac min.)	10	2	Rr, Ap, Ai, Ac		Rr, Ap	HuB	s, P	C	0	P/84, 89, 92, 93; G/86, 90; W/88	R	G / CAS (NAPL & NABA)	P
20F 09	164-150-38; 39; 40; 41; 42; 43; 44	8-LABU in part	North Skylane, east (Airport Business Center, north)	W	Airport Business Center				2	V, Af	C/I	C/I, V, Pp	HuB	(s, P)	C	0	P/84, 85, 90, 92; W/88	D		
20F 10	059-260-010	9-LABU	Sonoma County Airport, south end	W	County of Sonoma		A1 - B6 - F2	2	1	Pu	-	Pi	HuB	s, P	C	0	P/87, 88	D		P
20F 11	164-150-20		Windsor Water District/JC site	W	Windsor Water District		DA B5 (20 ac min.)	10	2	V, C/I	Pp?, Pi?	Pp, Rr, Ap	HuB	s, P	C	1	P/91, 93	D		P
20F 12	164-170-14 164-170-15		Sanders Road, south of Day Road (E of stock pond)	W	County of Sonoma			20	2	V, (Ap)	Pp?	Rr, Ap, Pp, Pi?	HuB	S, P	C	2	P/93, 94	D		
20F 13	164-150-13 164-150-14		Munderloh	W	Munderloh, Walter and Claire				2	Rr, Ap	?	C/I, Ap, V	HwB	P, s	C	0	P/84 (air), 89-93	C		P
20F 14	164-150-16		Skylane Business Park	W	Rand Graynor		A1 - B5	5.8	2	V, Ap	MP	C/I, Af	HuB, HwB	s, P	C	0	P/91, 92, 93, 94	D		P
20F 15	164-150-30; 31; 32; 33; 34; 35; 36; 37		North Skylane, west	W					2	V	C/I?	C/I, Pp, Ap, V	HuB, HwB	s, P	C	0	P/84 (air)	C		P (air)
20F 17	59-271-13		Piombo W. central	W	Piombo Construction		M?	51.81	3	C/I	C/I +?	C/I, V, Af	HwB	P	C	1	P/84 (air)	C		P (air)

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v, c, r	n	Gs	0.7?	1	25/2	E/5+/84 E/4/86 E/3/88 E/3/92 E/?/93	-	-	NAPL		LABU, Down. con., Psilo., Pogog. zizy., Erod., Plantago, Mim. tri., Anthoxanthum			D	Gs, Rr	H
v, s	A, N	Rr, Z, g, C	0.7?	Hist.: 3 Current: 1	0/4	E/6/84 E/5/86 E/4/88 E/3/92 E/2/93	-	-	NAPL, NABA	Trifol. grayi	Down. con., LABU, Hord. hys., Erod., Ortho., Brod. mult.!, Plagio. bract.			D	Rr, A, I, f, g, Zh	L
(v, s), d	A	C/I, G, F	(0.5)	0	(5/2)	E/2/84 E/2/85 E/4/88 X/0/90-93	-	-	-	-	wheat, fava beans				Af, C, C/I	M
"v"	A	I, C/I	0.2	-	80/1	E/6/84 E/6/87 E/6/88	-	-	-	-	LABU, Down. con., Pleuro. cal., Mentha, Lyth.				C/I, Pi	N
s, Us	n, A in part	C/I, d, g	0.2	0	5/1	E/2/91 ?/0/93	-	-	-	Trifol. grayi	Trifol. grayi & barbig., Hypoch. Junc. ten., Koelaria, Bromus mol, Pleuro., Hord. hys., Lol.			D	C/I, Af, Pp? Pi?	L?
S, s, Uw	n	Z, w, T	1	0	20/2	E?/?/84 (air) ?/0/93 x/0/94	-	-	-	Trifol. grayi	Vulpia, Koelaria, Hypoch., Lol., Hord., Mentha, Juncus buf.			D	Af, Pp, Pi	H
s, (v)	A	D, g, I?, (Zh), f	0.5?	2	10/20'	E/6/84 E/?/91 E/0/92 ?/0/93					LABU, Hordeum, Psilocar., Erod., Hypoch., Brom. mol.				Af, Ai, G, F, C/I	H
v, s, d	a, g, f, d	Gh, t	0.2	Historic: 2 Current: 0	10/2	E/4/91 E/4/92 E/3/93 E/1/94	-	-		DOHU, Trifol. grayi	Vulpia, Koelaria, Hypochoeris, Deschamp., Rumex, Microcala,				C/I, Ah	M
(v, s)	a	D, (Z), G, h, w	?			E/?/84 X/0/92					Lol., Erod., Hypoch., Vulpia, Hord.				C/I	M
w (industrial excavations and ruts)	A	C/I	?	?	?	E/4/84 (air) E/?/91 X/0/93									C/I (graded late '93)	?

*1 Map Code — Co. photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s — Sonoma County Assessor's Parcel number(s)
*3 EO No. — Element Occurrence number with CNDDB (# - Species)
*4 Place Name — General location name or description
*5 Geog. Sub- — **W:** Windsor, **L** Laguna, **U:** urban Santa Rosa (SR). **S** SW SR, **N:** NW SR, **E.** E SR, **P:** S SR Plain, **R:** rural SR; **C:** Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen Plan ; _/Co = county, __/Ci = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig.with — Contig. with other significant parcels? **0** = isolated, no other significant sites adjacent; **1:** undeveloped land adj., but no sig. wetlands; **2:** 1-3 adj. or < 20 ac sig. adj. land, **3:** 4 or > sig. adj. parcels or >20 ac sig. adj. land, **4:** >10 ac sig. adj. public land
*11 Current Use — A = Agriculture **Aw.** wastewater **Ao.** orchard **Ap.** pasture **Ar:** row crops **Av:** vineyard, **Ai:** irrigated, **Af:** hayfield, R = Residential **Rr:** rural **Ru:** urban. V = Vacant P = Public **Pc:** conservation, **Pr:** recreation, park, **Ps:** school **Pp:** wastewater pond, **Pi:** wastewater irrigation, **Pu** public utility C / I, commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s), (see # 11)
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*16 Restr. Layer — Restrictive soil layer ? **S_** dense surface clay (**Se:** entire profile = clay, **Ss.** compacted surface layer); **B_:** subsurface layer (**Bc:** clay, **Ba:** cemented alluvium, **Bo:** other),
*17 Watershed — **0:** less than 2 ac, **1:** 2-10 ac, **2:** 10-50 ac, **3:** > 50 ac
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*22 Habitats — Habitats: **V/v:** sig./minor vernal pools, **S/s:** swales, **R/r:** riparian, **P/p:** peren. marsh, **M/m_:** meadow (_w: wet, _d: dry). **C/c:** creek, **D/d:** ditch / flood channel, **A/a:** farmed wetlands, **F/f:** floodplain, **W/w** other wetlands, **N/n:** man-made pond, **U_:** other significant upland habitats (**Ug:** native grassland, **Uw:** wildflowers, **Uo:** oak woodland, **Us:** oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — **N:** natural topog., ± unaltered (**n:** with minor alterations), **A:** hist. sig. altered (**a:** sig. altered, but stabile); **X:** completely graded/converted
*24 Influences — Major influences: **F/f:** major/minor fill, **G/g:** major/minor grading, **Z_:** grazed (_c: cattle, _s: sheep, _h: horses), **Y/y:** livestock yard, **D/d:** disked, **O/o:** mowed, **C/c:** cultiv., **I/i:** irrig., **J/j:** junk, **H/h:** hydrol. altered, **M/m:** manure, **E/e:** exotics, **W:** weeds, **T/t:** thatch, **V/v:** vehicles, **R/r:** residential use, **S:** wastewater; (__): hist.
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*27 Wet. Break. — % aquatic/no. of features: **1:** solitary, **2.** 2-5, **3:** 6-15, **4:** >15
*28 LABU — *Lasthenia burkei*: **E:** extant, **X:** extirp., **H:** hist./abund. class: **'0':** none, **0:** <10 plants, **1:** 10-100, **2:** 100-500, **3:** 500-1000, **4:** 1000-5000, **5:** 5000-10,000, **6:** 10,000-100,000, **7:** > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N. bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; (__): historic
*32 Secondary — **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG:** *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig. aquatic invert.s, **Aa:** amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H:** high (land use changes, minor manip.); **M:** medium (some landscape manipulation); **L:** low, major reconfiguration/grading required; **N:** none warranted; **0:** too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20F 18	164-150-15		Piombo North	W	Piombo construction		M?	7	2	Rr	C/I ?	C/I, Rr, V	HwB	s, P	C	0?	P/84 (air)	C (air)		P (air)
20F 19	historic site; exact location unknown		Shiloh Road west, historic	W					0	R?			HwB	s, P	C	0	P/84 (air)	C		P (air)
20F 20	164-140-06		Shiloh Golf Course east	W	Airport Business Center			83.90		V, Af	Ru or C/I	Pr, Ah, V	HuB, HvC	s, P	C	1	P/94 in progress	D		
20F 21	164-130-11		Vet. clinic, Conde Lane	W	Woolsey, Denney, et al			7.51	1	C/I, V	C/I ?	V, Rr, C/I	HuB	s, P	C	0	P/92-94	D		
20F 22	164-130-06 164-130-15 164-130-10		Dowd/ Wilson Lane	W					1	V	?	Rr, C/I, Ap	HuB	s, P	C	1	P/92, 93	R		
20F 23	164-140-008		Henthorne	W	Henthorne ('Vosti' Tent. Map)			20.4	3	Ap, Rr	subdiv. into 4 lots, '87	Ap, C/I	HuB	s, P	C	1	P/93	R		
20F 24	163-130-21		Biocca	W	Biocca			5.59	1	Rr, Ap	C/I ?	Ru, Rr, V	HtA	s, P	C	0	P/93	R		
20F 25	163-172-011		Varvell	W	Varvell et al			11	0	V	Ru, C/I	Ru	HvC	s, P	C	0?	S/92	D		
20F 26	59-28-51		Wikiup Mitigation Bank	W	S.U.I. Corp.		commuinty separator ?	12	1	V	Pc	Ru, Rr, Av	HuB, YsA, ZaA	s, P	C	1	P/92, 93	D		P
20F 27	unknown		Old Redwood Hwy curve (Son. Co. Public Works site)	W					0	V	?, Pu (road widening)	Ru, C/I	HcC	s	?	0	P/93	D		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ P sts	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, d	a	Rr, A, C/I	?	0	?/1	E/3/84									C/I, Rr	? (0)
s, d	a	Rr, C/I	0.2?			E/?/84									C/I, Rr, A, I	?
s, d, C	n	Ah, I, G, H	?	?	?											
s, v, Ug	A	Af, C/I, Z	0.3	0	20/3	-	-	-	-	-	Pluero. cal., Mentha, Hord. hys., Lol., Vulpia, Hypoch., Las. glab., Juncus ten.				C/I, Af	?
(s, v, w), Us	A, Z	H, F	?	?	?										C/I	M
s, d, w, "n", Us	n	Zh, T, I	?	1	10/2						Lolium, Q. lobata			D	I, Z, Rr, Ru?	H
s	A	Z, w	0	-	-	-	-	-	-						C/I	L
s	N	D, Ac?	1.8 C	1	?/1	-	-	-			Danth., Hord. brachy., Limn. doug., Rumex, Mentha	S?		D	Ru	H?
s, Us	n	D, T	0.2	0	0/2	-	-	-	-	-	Lolium, Hord. hys.			D	T, Af	H
d, w	A	C/I, Rr	0.1		40/1	-	-	-	-	-	Rumex, Pleuro. cal., Xanth., Lol., Hord. hys.			D	Pu, Rr	L

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*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d. dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w. other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features: 1: solitary, 2. 2-5, 3. 6-15, 4: >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N. none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20F 28	059-250-28		Shapiro	W	Arcturus Land Corp., 3617 Westwind Blvd. Santa Rosa			20 ?	1	V	C/I	C/I, V	HtC, ZaA	s, S, P	C	1	P/93	P		
20F 29	059-250-29		Westwind	W	Berg, Barnard and Adele			11.71	1	V	C/I ?	C/I, V	HtC, ZaA	?						
20F 30			Saris	W	Saris				1	V	C/I	V, Ru, Rr	HwB, CeA	s, P	C	1	P/93; S/93	R		
20F 31	163-130-24 163-130-25		Hembree Lane (Shiloh Center west)	W					1	V	C/I	Rr, C/I, V	HwB	s, P, (S)	C	1	P/93, 94	D		
20F 32	59-271-28		Standard Structures south	W	Calletti		M1 ?	78.25	1	V, C/I	C/I	C/I, V, Af	HwB	s, P	C	1?	P/89, 92	D		P
20F 33	059-340-04	8-LABU	Sarasy easement - set-aside	W	Lou Sarasy		MP / F2	0.4	1	V	C/I	C/I, Pp, Pc	HuB	s, P	C	0	H/81; P/84-93; G/86	R, D	H/JC	P
20F 34	059-300-01		Williamson site, Shiloh Road east ('Shiloh Oaks'?)	W	Williamson ?		UA BG 20ac	62	2	V, Ap	?	Ap, Rr, Ru	YsA, HuB	s, S, P	C	1	P/89	D		
20F 35	059-31-40 059-31-41		104 Shiloh Road (Tremblay)	W	Tremblay			11.6	1	V	Ru?	Rr, V, Af	HtA	s, P	C	1	P/90, 92, 93	D		
20F 36	164-150-01		Shiloh Road at Day Road, SE	W	Murell, John M. 1383 Windsor River Road, Windsor			8.5	1	Af, Ai, Rr		Rr, Ap, Af	HuB, HwB, HvC	S, s, P	?	1	P/92	D		
20F 37	164-150-02		Day Road south of Shiloh	W	Canellos 6880 Day Road, EWindsor			3.5	2	Rr, Ai		Rr, Ap, Af	HuB	s	?	0	P/92	D		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
	A														C/I	?
															C/I	?
s	n	Af, t	0.6	0	0/3						Lol., Hord. hys., Rumex, Danth., Juncus ten.				C/I	N
s, v, c, Ug, r	n	Zh, T	0.8 C	1	30/2	-	-	-	-	PEGAG, HECO?	Lol., Hord. hys., Pleuro. cal., Mentha, Rumex, Down. con., Frax.		<CTS, LO>	D	C/I	M
s, v	a	D, C, C/I, h, g	0.2 ?	0	20/1	E/4/89 E/4/92	-	-	-	-	Lol., Hord. hys., Mentha, Vulpia, Hypoch., Plagio. bract.				C/I, I, Af, H	L
v, s, w	n	C/I, T, D	0.2	1	90/2	E/3/81 E/3/84 E/1/89 ?/0/93	-	-	-	-	Pleuro. cal., Lol. Hord. hys., Rumex				C/I, T, w, j	L
s, v, mw, Us, Ug?, C, R	N	Ap, T	2 + ?	3	20/'3'	-	-	-	-	RALO, Q	Lolium, Hord. hys., Ran. mur., Carex, Juncus, Eleoch., Lilaea, Lim. doug. niv., Eryng. arist.				Ru?	H
s, v, Us	A, n	(Z), Rr	0.3	0	20/2	-	-	-	-	Trif. grayi, Q	Lolium, Hord. hys., Rumex, Lim. doug. nv., Pleuro., Plagio. bract.			D	Ru	M?
v, s, d	N	(Z), I, T	0.3	0	50/'2'	-	-	-	-		Pleuro., Glyc. occ., Down. con., Lilaea, Rumex, Lolium			D	Ai, R	L
s, d	N	(G), I, T	0.1	0	0/1	-	-	-	-	-	Lolium, Hord. hys., Bromus, Brass.			D	Ai, R	N

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*4 Place Name General location name or description
*5 Geog. Sub- W: Windsor, L: Laguna, U: urban Santa Rosa (SR). S SW SR, N: NW SR, E: E SR, P: S SR Plain; R: rural SR; C: Cotati
*6 Owner Owner of site
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*8 Zoning Zoning/Gen.Plan ; __/Co = county, __/Ci = city
*9 Site size Approx. acreage of site (generally one parcel)
*10 Contig.with Contig. with other significant parcels? **0** = isolated, no other significant sites adjacent; **1**: undeveloped land adj., but no sig. wetlands; **2**: 1-3 adj. or < 20 ac sig. adj. land; **3**: 4 or > sig adj parcels or >20 ac sig. adj. land; **4**: >10 ac sig. adj. public land
*11 Current Use A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**. pasture **Ar**: row crops **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**. school **Pp** wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utility C / I: commercial/industrial
*12 Prop. Use Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H). on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system: **S/s**: major / minor surface system, **G/g**: groundwater,**P/p**: perched water table, **F/f**: floodplain
*16 Restr. Layer Restrictive soil layer ? **S_**: dense surface clay (**Se**: entire profile = clay, **Ss**: compacted surface layer); **B_**: subsurface layer (**Bc**: clay, **Ba**: cemented alluvium, **Bo**: other),
*17 Watershed **0**: less than 2 ac, **1**: 2-10 ac, **2**: 10-50 ac, **3**: > 50 ac
*18 Years Surv. Investigator / yr: **P**: Patterson, **W**: Waaland, **G**: Guggolz, **H**: Harrison, **O**: Ornduff, **R**: Rubtzoff, **S**: WESCO, **M**: McCarten, **N**: Northern, **Q**: Quibell, **JS**: Jones & Stokes
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*32 Secondary **DOHU**: *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP**: *Pogogyne doug. parv.*, **PEGAG**: *Perideridia gairdneri g.*, **HECO**: *Hemizonia congesta*, **Q**: *Quercus lobata*; (__): hist.
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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
20F 38	164-130-05		1101 Wilson Lane (Mickles)	W	Mickles				1	Rr, A	Ru?	V, Rr	HuB, HwB	s, P	C	1	P/90	D		
26A 01	057-080-26	2-LABU	Denner Ranch	L	Denner Ranches, Inc.			364.58	2	Ap, Ah		A	HtD	s, P	C	3	R/69; G/87	R	R/UC	
26A 02				W	City of Santa Rosa ?															
26A 03	057-070-43 057-070-44 059-200-20		Slusser Ranch	W	Slusser				1	Av, Rr, V		A	HtC, YnA, HwB	s, P	C	2	P/91	R		
26A 04	059-200-20		Laughlin Road Winery site	W	Kendall - Jackson ?			84.5	1	Av, V	C/I, Av	A, Rr	HvC, YsA, HwB	s, P	C	2	P/91, 93, 94; JS/92	R, D		
26A 05			lands of Laguens (at confluence of	W	Laguens					Af	Ai	A		S, f, P			P/92	D		
26B 01	034-041-13		San Miguel at Fulton, NE	N	Barnheart		A1	8.74	2	Rr	Ru?	Rr, Ap	CfA, HuB	s, P	C	1	P/88, 91, 92; ESA/90	R, D		
26B 02	originally part of 034-021-17 034-021-32 (now subdivided)		San Miguel Rancho	N			A1	(58)	(3)	Ru		Ru, Rr	HtC, HuB	(s, P)	C	2	P/88, 89; G/88; W/88	D		
26B 03	034-042-77		Alton Lane mitigation site	R	Cobblestone Development; to be deeded to CDFG		AE - B6	29	2	Pc	Pc	Rr, Av, Af	HtA, HvC	P, s	C	1	W/88; P/89-94	R, D		P
26B 04	034-05-10		Hartman Road near Piner Road west	R	Tesauro, Nicholas & Olga			69.66	3	Ap, Af		Ap, Af	HtA	P, S, s	C	2	W/88; G/90	C		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v	n	Z, I, M, R	0.6?	0	75/2	-	-	-	-		Pleuro, Xanth. Rumex, Lol., Down. con., Plagio. bract., Hord. hys., Mentha, Poa ann.			D	Ru, Ai, Ap	L
S, s, v, R, r, Pm, C	N/n	Gc, C, d, f				E/?/69 E/?/74 H/?/87				PODOP	Ortho., Lasth. glab., Pleuro. etc.				A, G, C, I, D	H
s, (v), r, a, N	a/A	C, I, d, Rr		1		-	-	-							Rr, A	L
s, v, d, C, R, w, a	a	Av, d, I	0.5	0	10/2	-	-	-			Lolium, Rumex, Hord. hys., Xanth.		0	D	C/I	L
s, C, R, a	a	C, I, D		0		-	-	-								L
s, v	n	Z, Rr, T	0.2	1	70/2	E/1/88 H/'0'/90 H/'0'/91 E/1/92	-	E/2/88 H/'0'/90 H/'0'/91 E/2/92		RALO	Pleuro., Down., Lilaea, RALO, BLBA, Hord. hys., Lolium			D	Ru, T, z, Rr	H/N?
(s, V, v)	X		(2.7)	(2)	(70/3)	E/4/88 E/4/89 E/4/90 X/-/92	-	E/5/88 E/5/89 E/3/90 X/-/92		(RALO)	Pleuro, Lasth., Down., Eryng.,					0
"V", "v", S, s, v, md, Uo, Ug, Uw	n, A	t, Rr, h, E	7+	3	60/40	?/0?/88 E/5/89 E/6/90-94	E/1/93 E/1/94	E/4?/88 E/7/89-94		DOHU, RALO, PODOP	Pleuro. cal., Down. con., Plagio. bract., BLBA, Hord. hys., Danth. cal., Mentha	P	LO	D	Rr, t	N
V, S, v, s, Uo	n	Z				E/1/88 E?/-/90		E/4/88 E?/-/90			Quercus				A	H

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*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; (__): historic
*32 Secondary — **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG:** *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig aquatic invert.s, **Aa:** amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H:** high (land use changes, minor manip.); **M:** medium (some landscape manipulation); **L:** low, major reconfiguration/grading required; **N:** none warranted; **0:** too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.				
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?	
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21	
26B 05	034-050-12 034-050-14		Maccario's oaks (Piner Rd west)	R	Maccario, Anthony et al		AE B6	50	3	Ap, Af		A	HtC	P, s	C	1	W/88; G/90	R			
26B 06a	034-060-11	15-BLBA in part	Comalli West (oak woodland)	R	Comalli, Lena		A1 - B6		1	Rr, V		Av, Ap			C	1?					
26B 06b	034-060-12	21-LABU 15-BLBA	Comalli/Simi Winery easement (fronts on Piner Road)	R	Simi Winery			0.5 (119.63)	0	Pp	Pp	Av, C/I	HuB, HvC	s, P	C	0 (2)	G/86, 90, 91; W/88; P/91	C, D		P	
26B 06c	034-060-12	21-LABU 15-BLBA	'Comalli North' extreme NE corner of Simi parcel	R	Simi Winery			1.0 (119.63)	1	Av	Av	Av, Af		P	C		W/88; P/91	C			
26B 07	034-081-33	13-LABU 11-BLBA	Abramson Road No. 1 (Piner H.S. area) (Emigh)	R	Emigh, Frederick M.		A1 - B6 (Co.)	8.18	2	Rr, Av	Rr	Rr, Ap	HuB	s, P	C	2	H/76,88; G/88,90; W/88	R			
26B 08	034-290-19		Oak farm/Frazee	R	Frazee, Willard and Carin		RR - B5 (Co.)	1.95	1	Rr		Rr, Ap	HuB	P, s	C	1	W/88				
26B 09	034-080-41 034-81-56 034-81-58		Santa Rosa scenic easement 224	R	City of Santa Rosa		A1 - B6, B7 (Co.)	49.10	3	Ap	Ap, Rr?	Ap, Rr	HvC, HuB	P, s	C	2	W/88; G/93	C			
26B 10	034-101-16		Abramson Road No. 2 (Piner H.S. area) (Boutz)	R	Boutz, Francis and Pauline		A1 - B6 (Co.)	10	2	Ap	Ap	Ap, Rr	HuB	s, P	C	2	W/88; G/88, 90	R			
26B 11	034-101-15		Abramson road No. 3 (Piner H.S. area) (Stone)	R	Stone, Chester and Nellie		A1 - B6 (Co.)	7	2	Ap, Rr	Ap, Rr	Ap, Rr	HuB	s, P	C	2	W/88, G/88, 90	R			
26B 12	034-091-39		Paradise Lane # 1 (Jinks)	R	Jinks, Don		A1 - B6 (Co.)	15	2	Rr, Ac	Rr, A	Rr, Ap, Av, Ah	HuB	s, P	C	1	W/88; G/90; P/92	C, R	G/UC		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
v, s, Uo, Ug	N	Zc				-	-	E/4/88	-	-					Ap	H
	N					?		H/?/90							Rr	N
v, s	n	Z, Av, Ai, w, t	0.3 (3+)	2	20/2	E/2/88 E/2/90 E/2/91		E/6/86 E/2/90 E/2/91			Lol., Hord.hys.				Av, T, I	L
(s, v)	a	Av, I	0.2			E/?/88 E/5/91	-	E/?/88 E/6/91		RALO					Av, I	L
s, v	A	z, j, w, f, d				E/?/82 H/0/88	-	E/2/88 E/2/90		PODOP	non-native annuals, v.p. spp., Mentha	H?		D	Rr, F,	M
v, Uo, Us	n/A	Rr			?/2			E/2/88			v.p. spp., landscaping			D	Rr, w	L
V,v, S, s, Us, Ug	n	Zc			?/3	-	-	E/6/88							G, Rr, w, m, t	H
S, s, v	n/a	Zh, R, m, w, t		2?	?/3?	-	-	E/6/88 E/6/90			non-native annuals, v.p. spp.			D	Rr, Ru, A, Z	H/N?
S, s, v	n	Zh, R, m, w, t		2?	?/2?	-	-	E/5/88 E/5/90	-	-	non-native annuals, v.p. spp.			D	Rr, Ru, Ap, Z	H
S, s, (v)	n/a, G, F	(Z), C, D, Z, f	(3) 1.6	1	30/2	-	-	E/3/88 E/4/90 E/3/92		RALO	Pleuro., Plagio. bract., Down. con., Hord. hys., Lolium, Rumex			D	Rr, C, I?, D, G	H

*1 Map Code Co photo # + sequential # (contin from Waaland, '89)
*2 A.P. No.s Sonoma County Assessor's Parcel number(s)
*3 EO No. Element Occurrence number with CNDDB (# - Species)
*4 Place Name General location name or description
*5 Geog. Sub- W: Windsor, L. Laguna, U: urban Santa Rosa (SR), S SW SR, N: NW SR, E. E SR, P: S SR Plain, R: rural SR, C: Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen.Plan , __/Co = county, __/Cl = city
*9 Site size Approx. acreage of site (generally one parcel)
*10 Contig with Contig with other significant parcels? 0 = isolated, no other significant sites adjacent; 1: undeveloped land adj , but no sig. wetlands, 2: 1-3 adj. or < 20 ac sig. adj. land; 3: 4 or > sig. adj parcels or >20 ac sig. adj land; 4: >10 ac sig. adj. public land
*11 Current Use A = Agriculture Aw: wastewater Ao: orchard Ap pasture Ar: row crops Av. vineyard, Ai. irrigated, Af hayfield, R = Residential Rr: rural Ru: urban. V = Vacant P = Public Pc: conservation, Pr recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utilityC / I: commercial/industrial
*12 Prop. Use Proposed or likely future land use(s); (see # 11)
*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H). on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system: S/s: major / minor surface system, G/g: groundwater,P/p: perched water table, F/f. floodplain
*16 Restr. Layer Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss. compacted surface layer); B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. Investigator / yr: P: Patterson, W: Waaland, G: Guggotz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. C: casual, fence, airplane; R: reconnaissance; D: detailed (EIR, etc); P_: Data proprietary. data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry). C/c. creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/\minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features: 1: solitary, 2: 2-5, 3: 6-15, 4: >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4. 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26B 13	034-091-12		Paradise Lane # 2	R	Szeto		A1 - B6 (Co.)	3.39	2	Rr		Af, Av, Rr	HtC	s, P	C	1	W/88; G/90	C		
26B 14	originally part of 034-023-14 (now subdivided)		TMB Brown Subdivision	N			R?	10.83	(3)	Ru	Ru	Rr, Ru	CtA, CfA	s, P	C	1	P/88, 89; G/88	R, D		
26B 15	subdivided	10-BLBA 20-LABU	San Miguel Road - San Miguel Estates No. 1	N	Cobblestone Development (now developed)			7.96		Ru	Ru	Rr, Ru	HuB				H/78; G/86; P/89-93	R, D		P
26B 16	034-023-16		San Miguel Estates No. 2 north	N	Cobblestone Development			3.33	2	Af, Rr	Ru	Rr, Ru	CtA	s, P	C	1	P/88, 89, 93	D		P
26B 17	subdivided	13-BLBA	Westwood Village	U	misc. subdivided					Ru		Ru	HuB				G/86, 88; W/88	R		
26B 18	034-030-71		Francisco elbow	N	Francisco Joint Venture		A1 B6	3.84	1	Rr, Af, Ap	Ru	Rr, Ap	CfA, HtC	s, P	C	0	G/88; W/88; P/89, 92	C, D		P
26B 19	059-070-61		Raplee Terrace	N	Swansen		RR		1	Rr, V	Ru?	Rr, Ru, V	HtC	P, s	C	1	G/88, 90	C		
26B 20	157-020-09 157-020-01		Hemmerle/ Pitzel; S of Piner H.S.	R	Pitzel (IN)			37.92	3	V	Ru?	Rr, Ap, V	HuB	s, P	C	2	W/88; G/88	R		
26B 21	034-021-29 now subdivided		Rancho San Miguel No. 2	N	misc.			(2.36)	(2)	Ru		Ru	HuB				P/88; G/88; W/88	R		
26B 22	034-023-01 034-023-02 ? 034-023-03 ?		San Miguel Road ('Manes')	N	Manes			8.94	1	Rr	Ru?	Ru	HuB	s, P	C	1	P/88, 89; W/88	R		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
v, s	a	Rr, j, w, C	0.1?	0	?/1			E/2/88 E/2/90			non-native annuals			D	R, Av, W, I	L-M
(v, d, w)	(a)	Af, Rr	(4+)	(3)	(20/2)	E/4/88 E/3/89 X/-/93	-	E/2/88 E/2/89 X/-/93		(RALO) (PODOP)						0; subdivided
(V, S, v, s)	X		(3.5)			E/4/86 E/4/89 H/0/91 X/-/92-93		E/5+/78 E/6/86 E/7/90 E/2/91 X/-/93		RALO						0; subdivided
(w)	A		(.5)	(1)	(10/2)	E/5/88 E/5/89 X/-/93	-	E/2/88 X/-/93		RALO						L
(s, v)	X					E/?/86 E/?/88 X/-/9?										0; subdivided
v, s, Ug	n/N	Z, Rr, j, w, T	2.6	2	30/1	E/2/88 E/4/92	-	E/3/88 E/5/92		RALO	Pleuro., Rumex, Glyc., Lol., Hord. hys.,			D	Ru, Ap, Af, Ai?, Rr	H
v, s	a/n	V, r, d?	?	2	?/2	E/?/?		?/88		RALO				D	Ru, A, Rr, V	H
S, s, V, v, r, Uo, Us	n/N	Z, w, t, D		2	?/2			E/6/88			annual grassland				Rr, t, Ao, Ap	H
(s, v)	X							E/2/88 X/-/92								0
s, v	a/n	Rr, Ap, d	1.5	2	10/2	E/6/88 E/5/89	-	-			Hord. hys., lolium, Rumex, Down. con., Plagio.			D	Ru, Ap, V, D	M

*1 Map Code — Co photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s — Sonoma County Assessor's Parcel number(s)
*3 EO No. — Element Occurrence number with CNDDB (# - Species)
*4 Place Name — General location name or description
*5 Geog. Sub- — **W**: Windsor, **L**: Laguna, **U**: urban Santa Rosa (SR), **S**. SW SR, **N**: NW SR, **E**: E SR, **P**. S SR Plain; **R**: rural SR; **C**: Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen Plan , _/**Co** = county, __/**Cl** = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig with — Contig with other significant parcels? **0** = isolated, no other significant sites adjacent; **1**: undeveloped land adj., but no sig. wetlands; **2**: 1-3 adj. or < 20 ac sig. adj. land; **3**: 4 or > sig adj. parcels or >20 ac sig. adj. land; **4**: >10 ac sig. adj. **public** land
*11 Current Use — A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**: pasture **Ar**: row crops **Av**: vineyard, **Ai**. irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**: school **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utilityC / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s); (see # 11)
*13 Adj. Uses — Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils — Dominant soil (see SCS '72); (**H**): on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system: **S/s**: major / minor surface system, **G/g**: groundwater,**P/p**: perched water table, **F/f** floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_**: dense surface clay (**Se**: entire profile = clay, **Ss**: compacted surface layer); **B_**: subsurface layer (**Bc**: clay, **Ba**: cemented alluvium, **Bo**: other),
*17 Watershed — **0**: less than 2 ac, **1**: 2-10 ac, **2**: 10-50 ac, **3**. > 50 ac
*18 Years Surv. — Investigator / yr: **P**: Patterson, **W**: Waaland, **G**: Guggolz, **H**: Harrison, **O**: Ornduff, **R**: Rubtzoff, **S**: WESCO, **M**: McCarten, **N**: Northern, **Q**: Quibell, **JS**: Jones & Stokes
*19 Level Surv. — **C**: casual, fence, airplane; **R**: reconnaissance; **D**: detailed (EIR, etc.); **P_**: Data proprietary: data given are from: **Pc**: CNPS, NDDB; **Pg**: gen'l knowledge, lit., or unrestricted access; **Pp**: submitted to an agency; **Pn**: NW Annex. EIR; **Ps**: SW Annex. EIR; **Pa**: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS**: Calif. Acad. Sci.; **JEP**: Jepson; **DAV**: UC Davis; **UC**: UC Berkeley; **JC**: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v**: sig./minor vernal pools, **S/s**: swales, **R/r**: riparian, **P/p**: peren. marsh, **M/m_**: meadow (_w: wet, _d: dry), **C/c**: creek, **D/d**: ditch / flood channel, **A/a**: farmed wetlands, **F/f**: floodplain, **W/w**: other wetlands, **N/n**: man-made pond, **U_**: other significant upland habitats (**Ug**: native grassland, **Uw**: wildflowers, **Uo**: oak woodland, **Us**: oak savanna). (__): historic; "__" = man-made habitat
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*24 Influences — Major influences. **F/f**: major/minor fill, **G/g**: major/minor grading, **Z_**: grazed (_c: cattle, _s: sheep, _h: horses), **Y/y**: livestock yard, **D/d**: disked, **O/o**: mowed, **C/c**: cultiv., **I/i**: irrig., **J/j**: junk, **H/h**: hydrol. altered, **M/m**: manure, **E/e**: exotics, **W**: weeds, **T/t**: thatch, **V/v**: vehicles, **R/r**: residential use, **S**: wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (**C**): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet , **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. — % aquatic/no. of features: **1**: solitary, **2**: 2-5, **3**: 6-15, **4**: >15
*28 LABU — *Lasthenia burkei*: **E**: extant, **X**: extirp., **H**: hist./abund. class: '0': none, **0**: <10 plants, **1**: 10-100, **2**: 100-500, **3**: 500-1000, **4**: 1000-5000, **5**: 5000-10,000, **6**: 10,000-100,000, **7**: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
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*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H**: high (land use changes, minor manip.); **M**: medium (some landscape manipulation); **L**: low, major reconfiguration/grading required; **N**: none warranted; **0**: too altered, no real potential

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Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Lev l of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26B 23	subdivided ??		San Miguel Road ('Marovich)	N	Marovich				2	Rr	Ru	Ru	HuB	s, P	C	0	P/88; W/88	R		
26B 24	034-021-22	19-LABU	Pioneer 2000	N	Pioneer 2000 apartments			(10)	0	Ru	Ru	Ru	HuB	P	C	0	P/88-93; W/88	D		P
26B 25	034-050-26		Wood Road elbow NW	R	Sprague, Lewis and Delores			4.95	1	Ap	?	Rr, Ap, V	HvC	P, s	C	1	G/88, 90; W/88	R	G	
26B 26	034-091-27	9-BLBA	Piner @ Fulton, SW; SE of Piner School	R	Fraseri (WA)		A1 - B6 (Co.)	12.81	2	V	Ru?	Pr, Pu, Ru	HvC	s, P	C	0	W/88; H/89; G/86,88,90; P/89-94; Eakins/91	R	H/JC, G/UC	P
26B 27	034-091-18	19-BLBA	SW of Piner @ Fulton/ Imwalle	R	Imwalle		A1 - B6 (Co.)	49.35	3	Ap, Av	Av, Ap, Rr	Rr, Av,Pr	HtC, HtA	s, P	C	2	H/82; G/86,89; W/88	R	H/JC	
26B 28	034-101-69		Abramson Road No. 4 (Bainbridge east)	R	Szabo			4.26	1	Rr	Rr	Rr, Pc	HuB	s, P	C	0	H/88; G/88; Huntington/ 90	R	H/JC; G/UC; Hunt./?	
26B 29	034-101-70		Abramson Road NW ('Bainbridge West', preserve)	R	Brown, T. CDFG?			8	2	Pc, Ap	Pc	Ap, Rr	HuB	(S), s, P	C	2	?/88?; P/92	R		
26B 30	059-040-04		Bertolone - Wood Road	R	Larry Bertolone		DA B6	21.27	3	Rr, Ap	> Rr	Rr, Ap	HtC	P, S	C	2	N/93	D		
26B 31			Alton Lane South	R	CDFG?			6?	2	Pc	Pc	Pc, Rr, Av		"s", P	C	1	P/89-93; Monk/92, 93	D		P
26B 32	034-042-68		Alton Lane E (man-made ditch)	R	Giblin, J. and J.		RR BG 3ac	3.05	2	Rr		Rr		S, P	C	2	P/89-93	C		P

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ P sts	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v	(n)	Rr, Z, T	.5	1	10/1	E/2/88	-	-			Hord. hys., lolium, Rumex, Down. con., Pagio.			D	Ru, Ap	M
v	a	Ru, w, t	0.1	4	90/1	E/4/88-89;0/90, 93 1/91,94 2/92	-	-			Hord. brachy., Lolium, Rumex		0	D	Ru, j, T	L/N
v, s	a	Ap, Zs	?		?/2	E/4/88 E/?/90									Ap, Zs, Rr	M
s, v, Ug, Us	a/n	D, R, Ap, V	0.3?	1	0/2	-	-	E/5/86 E/4/88 E/4/89-94			Blenno. nanum, BLBA, Hord. hys., Lol., Ortho., Danth. cal., Plagio., Navarr. sp.			D	Ru, Rr, A	M
S, s, v, Ug	n, a	A, Z	?	2				E/4/88		DOHU	Danth. cal., Ortho., Hemiz. virg.			D	Av, Rr, Af, t	H
s, (v), (Ug)	a	Z, w, f, g, h		0 (2)	0/2	E/5?/88 E/3/89 X/0/91-93	-	-	(NABA)	HECO, Q.	Bromus mol., Vulpia, Antho., Erod., (Plagio., Navar., ...), Hord., Lolium	H?		D	Rr, A, I, C, F	H
S, s, V, v, "v", Uo	n	Zh, w, t, f		2	80/2	E/4/92	-	-		RALO	Pleuro., Hord., Mentha, Lolium, Q. garry.,			D	G, T, Rr	N
V, S, s	N	Z, D, h, m, g	2.1 ?	2	80/"16"	-	-	E/4/93	-	RALO, DOHU	Pleuro. cal., Lilaea, Juncus, Gratiola, Eryngium arist., Callit., Plagio. bract., Down. con.	N/93	0	D	Rr, Z, M	H
S, "s", "v"	A	created topog.		3	90/3	-/-/89 E/1/92 E/4/93		-/-/89 E/2/93		PODOP	Pleuro., Lilaea, Down., Plagio., Eryng., Callit.		0	D	Rr, w	N
D	A	Rr				E/2+/91-93		E/6/91 E/6/92 E/6/93							Rr	?

*1 Map Code — Co photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s — Sonoma County Assessor's Parcel number(s)
*3 EO No. — Element Occurrence number with CNDDB (# - Species)
*4 Place Name — General location name or description
*5 Geog. Sub- — W: Windsor, L: Laguna, U: urban Santa Rosa (SR), S. SW SR, N: NW SR, E: E SR, P: S SR Plain; R. rural SR; C: Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen.Plan ; __/Co = county, __/Ci = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig.with — Contig. with other significant parcels? 0 = isolated, no other significant sites adjacent; 1: undeveloped land adj , but no sig. wetlands; 2. 1-3 adj. or < 20 ac sig. adj. land; 3: 4 or > sig. adj. parcels or >20 ac sig. adj. land; 4: >10 ac sig. adj. public land
*11 Current Use — A = Agriculture Aw: wastewater Ao. orchard Ap: pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr: rural Ru. urban V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utilityC / I. commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses — Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils — Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system: S/s: major / minor surface system, G/g: groundwater,P/p: perched water table, F/f: floodplain
*16 Restr. Layer — Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss: compacted surface layer), B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed — 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3. > 50 ac
*18 Years Surv. — Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. — C: casual, fence, airplane; R: reconnaissance; D: detailed (EIR, etc.), P_. Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp. submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren marsh, M/m_: meadow (_w: wet, _d: dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stable); X: completely graded/converted
*24 Influences — Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. — % aquatic/no. of features: 1: solitary, 2: 2-5, 3 6-15, 4: >15
*28 LABU — *Lasthenia burkei*: E: extant, X: extirp., H. hist./abund. class. '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary — DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — CTS: CA tiger salamander, LO: CA finderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: H: high (land use changes, minor manip.); M medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26B 33	034-030-70		'Jacobsen'	N	Jacobsen			28.49	3	Af, Ap, Rr	Ru, C/I?	Rr, Ap, Af	HtC, CtA, HuB	s, P	C	2	P/88, 90, 92; ESA/90	R,Pn, Pa; D		P
26B 34	034-030-67		'Morrison Homes' WNW ('Ramon')	N	Ramon			19.59	3	Rr, Ap, Af	Ru	Rr, Af, Ap	HwB, HtC, HtA, CfA	s, P	C	2	P/88, 91-93; ESA/90	R, D		
26B 35	034-030-72		'Morrison Homes' South ('Matter')	N	Matter			28.83	3	Rr, Ap	Ru	Rr, Ap, Af, V	HuB, HtC, CfA	s, P	C	2	P/88, 91-93; ESA/90	R, D		P
26B 36	034-030-12		'Morrison Homes' NE	N	26B				2	Af	Ru	Rr, Ap, Ah		P	C	1	P/88, 91-93; ESA/90	D		
26B 37	034-030-65		NW Annexation area ('Cia')	N	(Cia ?)			9.67	2	Ah, Rr	Ru	Rr, Ap, Af	CfA, HuB	s, P	C	1	P/88, 91-93; ESA/90	D, R		
26B 38	034-022-02		NWSR Annex. 'Craigie & Johnson'	N	Craigie and Johnson			5.22	3	Rr, V	Ru	Rr, Ap	CfA, HtC, HuB	P	C	0	P/88, 91-93; ESA/90	R, D		P
26B 39	034-022-01		NWSR Annex. 'Stewart & Sachs'	N	Stewart and Sachs			5.23	3	Rr, Ap, V	Ru	Rr, V, Ap	HuB	s, P	C	0	P/88, 91-93; G/88; ESA/90	R, D, Pa, Pn		
26B 40	034-022-03		NWSR Annex. 'Stipinovich'	N	Stipinovich			5.22	3	Rr, Ap	??	Rr, Ap, Af, V	CfA, HtC	s, P	C	0	P/88, 91-93; ESA/90	R, D		P
26B 41	034-170-43 034-170-46 034-170-47		Mary's Meadows - set-aside	N				0.5?	0	V	Ru	Ru		s, P	C	0	P/88; S/92; P/93	R, D		
26B 42	originally part of 034-021-09 now subdivided		Seville Estates set-aside ('Cowan', 'Tolletson')	N				3	2	Ru		Rr, Ru	HuB	P	C	0	P88, 90-93; G/89	D		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	S condary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
S, s, V, v, mw, Uw	n	Af, Ap, m, t, c	3.65 ?	2	80/3	E/3/88 E/5/90 E/1/92	-	E/2/88 H/'0'/90 H/'0'/92		RALO	Pleuro, Plagio. bract., Down. con., Las. glab., Eleoch., Hord. hys., Lolium, Ortho. fauc.	P		D	Ru, Rr, Af, Ap, c	H/N
S, s, v, w	n	Z, R, M, w, T	2.85 C	2	30/2	-	-	E/3/88 E/3/90 E/'0'/91 E/5/92 E/1/93		RALO	Pleuro, Plagio. bract., Down. con., Las. glab., Hord. hys., Lolium, Ortho. fauc.		0	C, M, D	Ru, Ap, M, T, Af	H
s, v, d, Uw	a	Z, (C), w	6.07	2	20/3	?/'0'/88 E/0/93		?/'0'/88 E/3/90 H/'0'/91 E/0/92 E/2/93		RALO	Pleuro, Plagio. bract., Down. con., Las. glab., Hord. hys., Lolium, Ortho. fauc.		0	C, B, M, D	Ru, Ap, M, T, Af, d	M
a, d	A	C, T	0.1 C	0		-	-	-			Loliu, Hord., Lupin., + winter wheat, Vicia, Brassica		0	D	Ru	L
s, v	n	Z, R, t, w, d, o	0.8	1	50/2	-	-	E/2/88 E/3/90 E/3/92 E/3/93		RALO	Pleuro., Down., Plagio., Brod. pedunc.		0	D	Ru, Rr, A f	H
s, v, Ug	n	Z, T, Rr, g, f, w	0.3	1	10/2	E/3/88 E/?/90 E/1/91 E/3/92, 93	-	-			Hord. hys., Lolium, Down. con., Pleuro., Rumex		0	D	Ru, T, J, Ap, f, g	M/N?
s, v	n	Z, T, Rr, f	0.45	2	40/2										Ru, T, Rr	?
V, s, Uw, Ug	N	Z, Rr	1.2	3	80/1	E/6/88 E/6/90 E/4/91 E/6/92, 93	-	E/6/88 E/6/90 E/5/91 E/6/92, 93		RALO	Pleuro., Down. con., BLBA, LABU, Rumex, Plagio., Ortho. fauc.			D	Ru, Rr	N
s	a	Ru,T	0.2		0/1	-/'0'/88 E/0/92 H/'0'/93	-	-			Hord., Lolium, Lasth. glag, Mentha		0	D	Ru, F, T, W, D	L
v	a	(Ao), t, w	0.1	4	80/1	E/3/88 E/2/89 E/4/93	-	-			Rumex, Hord. hys., lolium, Plagio. bract., Down. con.				Ru	L

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*11 Current Use — A = Agriculture **Aw:** wastewater **Ao.** orchard **Ap:** pasture **Ar:** row crops **Av:** vineyard, **Ai:** irrigated, **Af:** hayfield, R = Residential **Rr:** rural **Ru:** urban. V = Vacant P = Public **Pc:** conservation, **Pr** recreation, park, **Ps:** school **Pp:** wastewater pond, **Pi** wastewater irrigation, **Pu:** public utilityC / I: commercial/industrial
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*16 Restr. Layer — Restrictive soil layer ? **S_:** dense surface clay (**Se:** entire profile = clay, **Ss:** compacted surface layer); **B_:** subsurface layer (**Bc:** clay, **Ba:** cemented alluvium, **Bo:** other),
*17 Watershed — **0:** less than 2 ac, **1:** 2-10 ac, **2:** 10-50 ac, **3:** > 50 ac
*18 Years Surv. — Investigator / yr: **P:** Patterson, **W:** Waaland, **G:** Guggolz, **H:** Harrison, **O:** Ornduff, **R:** Rubtzoff, **S:** WESCO, **M:** McCarten, **N:** Northern, **Q:** Quibell, **JS:** Jones & Stokes
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*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS:** Calif. Acad. Sci.; **JEP:** Jepson; **DAV:** UC Davis; **UC:** UC Berkeley; **JC:** SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v:** sig./minor vernal pools, **S/s:** swales, **R/r:** riparian, **P/p:** peren. marsh, **M/m_:** meadow (_w: wet, _d: dry). **C/c:** creek, **D/d:** ditch / flood channel, **A/a:** farmed wetlands, **F/f:** floodplain, **W/w.** other wetlands, **N/n:** man-made pond, **U_:** other significant upland habitats (**Ug:** native grassland, **Uw:** wildflowers, **Uo:** oak woodland, **Us:** oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — **N:** natural topog., ± unaltered (**n:** with minor alterations); **A:** hist. sig. altered (**a:** sig. altered, but stabile); **X:** completely graded/converted
*24 Influences — Major influences: **F/f:** major/minor fill, **G/g:** major/minor grading, **Z_:** grazed (_c. cattle, _s: sheep, _h: horses), **Y/y:** livestock yard, **D/d:** disked, **O/o:** mowed, **C/c:** cultiv., **I/i:** irrig., **J/j:** junk, **H/h:** hydrol. altered, **M/m:** manure, **E/e:** exotics, **W:** weeds, **T/t:** thatch, **V/v:** vehicles, **R/r:** residential use, **S:** wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet., **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. — % aquatic/no. of features: **1:** solitary, **2.** 2-5, **3:** 6-15, **4** >15
*28 LABU — *Lasthenia burkei*: **E:** extant, **X:** extirp., **H.** hist./abund. class. **'0':** none, **0:** <10 plants, **1:** 10-100, **2:** 100-500, **3:** 500-1000, **4:** 1000-5000, **5:** 5000-10,000, **6:** 10,000-100,000, **7:** > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N. bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; (__): historic
*32 Secondary — **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG:** *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig. aquatic invert.s, **Aa:** amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H:** high (land use changes, minor manip.); **M:** medium (some landscape manipulation); **L:** low, major reconfiguration/grading required; **N:** none warranted; **0:** too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26B 43	034-021-34		Pinercrest Road at Waltzer, NE ('Toso')	N	Toso			9.60	2	Rr, Ap		Ru	WhA, HuB	s, P	C	2	P/88, 89, 93; G/88, 89	R			
26B 44	036-01-46 036-01-49		Piner at Marlow (Crane/Avellar)	N	Avellar			7.64	2	Ap, Rr	Ru, C/I	Ru, Rr, V	WhA	s, P	C	2	P/90-94	D			
26B 45	036-011-08 036-011-09		Marlow Road condo.s	N	Neuschatz			5.16	2		Ru	Rr, Ru, Ap	WhA	s, P	C	1	G/89, 92; P/91; S/92, 93	D	G/		
26B 46	36-036-01 36-036-02		Carlton homes (Marsh Road)	U	Carlton Homes			3.2	0	V	Ru	Ru	HuB	s, P	C	0	S/91, 92	D			
26B 47	034-022-04		NWSR Annex. 'Deas'	N	Deas			3.58	2	Rr	Ru	Rr, Af	CfA, HtC	P	C	0	ESA/90	D			
26B 48	034-030-65		Piner Road - 'Cia'	N					1	Rr, Ap	Ru	Rr					P/90-93	D		P	
26B 49	036-011-38		Piner Road, west of 'Cia'	N	Piner Associates			1.63	1	Rr, Ao	Ru	Rr, Ap		s		0	P/92,93	D			
26B 50	036-011-43 036-011-47		Piner Road, east of 'Berk'	N	Moody, R. et al				2	Rr	Ru	Rr, V					P/92, 93	D			
26B 51	036-01-41		Piner Road - 'eucalyptus'	N	Berk, Barbara			10.41	1	V	Ru	Ru, Rr	WhA	s, P	C	2	G/89, 91; P/90, 91, 93	D, C		P	
26B 52	034-170-45		Piner Road - 'Haloran'	N	Ohlinger				0	Rr	Ru	Ru, V				0	P/92	D			

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v	n	Ap, Rr		2	50/3	E/6/88 E/7/89 E/5/93	-	-						D	Ru	H
s, v	n	Zh	1.5	3	40/3	E/2/90 E/4/91 E/4/93	-	-		RALO	Pleuro., Hord. hys., Rumex, Plagio. bract., Down. con., Ortho. fauc.		0	D	Ru, C/I, Gh	H/N?
s, v	a	G, D, m, t	0.6 C	1	20/2	E/2/89 E/1/92 E/1/93	-	-		DOHU, RALO	Hord. hys., Lolium, Plagio. bract.,	S	0	D	Ru, Rr, D, w, t	M/H
s, v	a	Rr, Af	0.4 C	2	20/1	-	-	-		DOHU	Hord., Loliu, Eleoch.	S	0	D	Ru, T	L
s, v	a	Z, R	0.88	2		-	-	E/2/90						D	Ru, Rr, Ap	L?
(s)	A	Rr, Z	0 C	-	-	-	-	-			Erodium, Bromus, Lotus corn., Hord. hys., Lolium, Lythrum, Poa ann.		0	D		N
d	A	Rr, d, w	0.1	0	60/1	-	-	-			Rumex, Pleuro., Lolium, Lythrum + annual grasses and weeds		0	D	Ru, Rr, A, d, w	L
--	A	Rr, Z, f	0			-	-	-			annual grasses and ruderal weeds		0	D	Ru	L / 0?
s, v, d	n, a	j, w, E, H, V	2.0	2	50/2	E/3/89 E/6/90 E/3/91 E/4/93	-	-	NABA	RALO, Q.	Pleuro., Down. con., Plagio., Hord. hys., Mentha; + Bromus, Eucalyptus			D	Ru, j, t, w, H, V	H
--	A	Rr, Z, f	0			-	-	-			annual grasses, ruderal weeds, and landscaping			D		0

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*5 Geog. Sub- W: Windsor, L: Laguna, U: urban Santa Rosa (SR), S SW SR, N: NW SR, E: E SR, P: S SR Plain; R. rural SR; C: Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen Plan ; __/Co = county, __/Cl = city
*9 Site size Approx acreage of site (generally one parcel)
*10 Contig.with Contig. with other significant parcels? 0 = isolated, no other significant sites adjacent, 1: undeveloped land adj., but no sig. wetlands; 2 1-3 adj. or < 20 ac sig. adj land; 3: 4 or > sig adj parcels or >20 ac sig adj. land; 4: >10 ac sig. adj public land
*11 Current Use A = Agriculture Aw: wastewater Ao: orchard Ap pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr rural Ru: urban. V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utilityC / I: commercial/industrial
*12 Prop. Use Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H). on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system S/s: major / minor surface system, G/g: groundwater, P/p: perched water table, F/f floodplain
*16 Restr. Layer Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss: compacted surface layer); B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. C: casual, fence, airplane; R: reconnaissance, D: detailed (EIR, etc.); P_: Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry), C/c. creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__). historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c. cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est. wetland acreage (C): confirmed by Corps of Eng
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features: 1: solitary, 2: 2-5, 3: 6-15, 4 >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM. *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS. v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26B 53	034-050-52		Wood Road elbow South (Torrey)	R	Torrey			10.1	1	Rr, Ap	?	Rr, Ap, Ah	HtC	P, s	C	0	G/90; P/90	R		
26B 54	034-050-53, -54, -55		Wood Road elbow South ('Believers")	R	Believers Family Fellowship			33.7	3	Ap, Af	?	Ap, Rr	HtC	P, S, s	C	1	G/90	R		
26B 55	059-030-10		Wood Road at Fulton, NW	R	Kellett			29.24	0	Ap	?	Ap, Af, Rr	HtA	P			G/90	C	G/90	
26B 56	057-030-36		Skaug's horse pasture	R	Skaug		A1 B6	16.11	1	Ao, Ap, Rr		Rr, A	HtC	P, s	C	0	G/90	C	G/UC	
26B 57	057-021-19		west of Piner-Olivet School (off Willowside)	R	Piner Olivet School District		P	8.29	1	P		Rr, Ap	HtC, HwB	P, s			H/?	R		
26B 58 and 26D 05	157-020-03 157-020-08	21-BLBA	'Corrie' (off Guerneville Road, south of Piner H.S.)	R	Corrie			33	3	Af	Ru	Rr, Ap	HuB, HtC	S, s, P	C	2	W/88; P/89, 90, 92; G/90	C, Pc, Pg, Pa		
26B 59	034-023-15		San Miguel Estates No. 2 south	N	Gibbs/Negri ?				2	Rr, Ao	Ru	Rr, Ru	CfA	s	C	1	P/88, 89	D		
26B 60			Strief Lane	N					0	Rr, V	Ru	Ru		s, P	C	0	P/92, 93	D		
26B 61	036-011-44		Piner Road - Carinalli/Gardner Homes	N				6.12	2	V	Ru	Rr, Ru		P	C	1	P/90-93	D		P
26B 62	034-03-13		NW Annex.	N																

B I O T I C E N V I R O N M E N T

Habitats Present	Naturalness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
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v, r, Uo	n	Zc, Zs, R	?	?	?	E/1/90					Danth. cal., Pleuro cal., Ortho. fauc., Lolium			D,	Ap, h, Rr	Mod. ?
v, s, c, r, Uo	n	Zc, Zs, h, m, v	?	?	?	?					Danth. cal., Pleuro. cal., Ortho. fauc., Lolium			D, B	R, A	?
v	n	Z, Rr				E/3/90								D	Av?, R	H
v, s, Uo, Ug	a	Zh				E/3/90									A	M
v, s	a	A, Ps				H/?/?				(HECO)	Eleoch., Ortho. erian., Las. glab., Rumex	H?			Rr, Ps, w	?
S, s, V, v, Uw	n	Af, D		2		-	-	E/6/88 E/7/89 E/7/90 E/7/92		Q	Plagio., Pleuro., BLBA, Eleoch., Down., Limn., Ortho. fauc., + Collinsia, Lupin., Amsin., Platy.				Ru, Af	N
s	a	C, D, Rr, h, t				E/0/89	-	-			Hord., Lol., + orchard			D	Ru, Ao, I, w, T	M?
--	a	Rr, Z, T, W, J, F	0			-	-	-			annual grasses and ruderal weeds		0	D	Ru, J, T, h	L?
(V, S), s, w	A	Af, Rr, graded	1.5?	3	10/1	E/1/90 E/0/91 H/'0'/92 X/'0'/93		-			Lolium, Hypoch., Erod., Hord.		0	D	Ru, Rr, T, W	L

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26B 63	034-041-12		NW Annex.	N																
26B 64	034-041-10		NW Annex.	N																
26B 65	034-041-09			N																
26B 66	034-041-05			N																
26B 67	034-041-04			N																
26B 68	034-041-03			N																
26B 69			'Hover'	N	Hover															
26B 70	034-03-49		NW Annex.	N																
26B 71	057-021-22 057-021-28 057-021-29		'Gilmore' (west side of Willowside, south of Piner-Olivet School)	R	Gilmore			27.2		Ap, Rr	Rr	Ru, Rr, Ap, Ps					P/92, 94	D		
26B 72	054-120-14	6-BLBA	Wood Road Elbow (northeast corner)	R	Maggi			1.61		Rr		Rr, Ap					H/77; G/86, 88	C		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
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c, Us	N, A	G, Rr	0.5	0		-	-	-		RALO, Q.	annual grasses	P/92	<LO, CTS>	C, D	Rr, t	L/N
v	A, a	Rr						H/?/77 H/'0'/86 H/'0'/88						D	Rr	?

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*11 Current Use — A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**: pasture **Ar**: row crops **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**: school **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utilityC / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s); (see # 11)
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*14 Soils — Dominant soil (see SCS '72); **(H)**: on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system: **S/s**: major / minor surface system, **G/g**: groundwater,**P/p**: perched water table, **F/f**: floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_**: dense surface clay (**Se**: entire profile = clay, **Ss**: compacted surface layer), **B_**: subsurface layer (**Bc**: clay, **Ba**: cemented alluvium, **Bo**: other),
*17 Watershed — **0**: less than 2 ac, **1**: 2-10 ac, **2**: 10-50 ac, **3**: > 50 ac
*18 Years Surv. — Investigator / yr: **P**: Patterson, **W**: Waaland, **G**: Guggolz, **H**: Harrison, **O**: Ornduff, **R**: Rubtzoff, **S**: WESCO, **M**: McCarten, **N**: Northern, **Q**: Quibell, **JS**: Jones & Stokes
*19 Level Surv. — **C**: casual, fence, airplane, **R**: reconnaissance; **D**: detailed (EIR, etc); **P_**: Data proprietary: data given are from: **Pc**: CNPS, NODB, **Pg**: gen'l knowledge, lit., or unrestricted access; **Pp**: submitted to an agency; **Pn**: NW Annex. EIR; **Ps**: SW Annex. EIR; **Pa**: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS**: Calif. Acad. Sci ; **JEP**: Jepson; **DAV**: UC Davis; **UC**: UC Berkeley; **JC**: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v**: sig./minor vernal pools, **S/s**: swales, **R/r**: riparian, **P/p**: peren. marsh, **M/m_**: meadow (_w: wet, _d: dry), **C/c**: creek, **D/d**: ditch / flood channel, **A/a**: farmed wetlands, **F/f**: floodplain, **W/w**: other wetlands, **N/n**: man-made pond, **U_**: other significant upland habitats (**Ug**: native grassland, **Uw**: wildflowers, **Uo**: oak woodland, **Us**: oak savanna). **(__)**: historic; "__" = man-made habitat
*23 Natural. — **N**: natural topog., ± unaltered (**n**: with minor alterations); **A**: hist. sig. altered (**a**: sig. altered, but stable); **X**: completely graded/converted
*24 Influences — Major influences: **F/f**: major/minor fill, **G/g**: major/minor grading, **Z_**: grazed (_c: cattle, _s: sheep, _h: horses), **Y/y**: livestock yard, **D/d**: disked, **O/o**: mowed, **C/c**: cultiv., **I/i**: irrig., **J/j**: junk, **H/h**: hydrol altered, **M/m**: manure, **E/e**: exotics, **W**: weeds, **T/t**: thatch, **V/v**: vehicles, **R/r**: residential use, **S**: wastewater; **(__)**: hist.
*25 Acres Wet — Est. wetland acreage (**C**): confirmed by Corps of Eng.
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*27 Wet. Break. — % aquatic/no. of features: **1**: solitary, **2**: 2-5, **3**. 6-15, **4**. >15
*28 LABU — *Lasthenia burkei*: **E**: extant, **X**: extirp., **H**: hist./abund. class: '0': none, **0**: <10 plants, **1**: 10-100, **2**: 100-500, **3**: 500-1000, **4**: 1000-5000, **5**: 5000-10,000, **6**: 10,000-100,000, **7**: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL**: *Navarretia pleiantha*, **NABA**: *N. bakeri*, **ALAES**: *Alopecurus aequalis sonomensis*, **TRAM**: *Trifolium amoenum*, **PLHO**: *Pleuropogon hooverianus*, **CAAL**: *Carex albida* ; **(__)**: historic
*32 Secondary — **DOHU**: *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP**: *Pogogyne doug. parv.*, **PEGAG**: *Perideridia gairdneri g.*, **HECO**: *Hemizonia congesta*, **Q**: *Quercus lobata*; **(__)**: hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS**: CA tiger salamander, **LO**: CA linderiella, **VPS**: v. p. shrimp, **FS**: freshwater shrimp, **R**: raptors, **W**: waterbirds, etc., **AI**: sig. aquatic invert.s, **Aa**: amphibians; **(__)**: potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C**: crayfish, **B**: bullfrogs, **M**: mosquito fish, **D**: dogs/cats; **L**: *Lippia*, **P**: *Phalaris*, **X**: *Xanthium*, **G**: grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H**: high (land use changes, minor manip.); **M** medium (some landscape manipulation); **L**: low, major reconfiguration/grading required; **N**: none warranted; **0**: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
* 1	* 2	* 3	* 4	* 5	* 6	* 7	* 8	* 9	* 10	* 11	* 12	* 13	* 14	* 15	* 16	* 17	* 18	* 19	* 20	* 21
26C 01	130-200-63 130-200-64	3-LABU	Hall Road at Laguna	L	Nunes		Ae - B5 - F2	95.33 134.83	2	Ap		Ap, Af	CfA	s, F	C	2	R/66, 73, 74; W/88	R	R/UC		
26C 02	130-210-22		Sanford Road at Occidental	L	Christiansen		A1 - B6 - F2	65.01	0	Ap		A	WhA, WgC, WoA	s, P, F		3?	W/88	C?			
26C 03	130-250-36	14-LABU	Occidental Road horse pasture	L	Lahlogh, Habib (Lucchesi ?)		A1 - B6		0	Ap		A	WhA, WoA	s, P, F			H/79; W/88; G/88	R	H/JC		
26C 04	060-330-27 060-336-25 060-330-26	9-LIVI	High School Road; Aggio Dairy; Laguna at Occidental Road	L	Aggio Dairy		AE - F1 - B5	18.2 4.0 58.49	3	Ap		A	CfA	P, F		2	R/58, 62; H/79; G/81; W/88	R, C	R/CAS, H/JC	G	
26C 05	060-330-16		Ambrosini	L	Ambrosini			47.53	3	Ap, Av	A	A	CfA, WoA	s, P, F		2	W/88	C			
26C 06	60-330-28 (+29, 30 ?)		Stone	L	Stone			30.79	2	Ap			WoA, WhA, CfA, WmB	s, P, F		2	G/81	R		G	
26D 01	130-210-10	16-LABU	Hall Road at Willowside	R	Mattei						Rr	A	HtC, HwB, HuB	s, P	C		H/86; W/88; G/90?	C			
26D 02	130-223-81	17-LABU	Hall Road at Piezzi, SE; 'Lands of Crinella'	R	Crinella/Randell		RR - B5	31.36	1	Ap, V	Rr	Rr, Ap	WhA, WoA	s, P	C	2	G/86; W/88; P/91-92, 94	C, D			
26D 03	035-051-23 035-051-14		Hall & Occidental near Fulton ('Cramer')	R	Cramer, Glenn P.O. Box 4, Rancho Mirage		A1 - PA	174.13	2	Ap	Pr	Ru, Rr, Ap	WhA, WgC, WoA, CfA	s, S, P	C	3	W/88; G/88; P/91-94	R, D	G/UC	P	
26D 04	035-042-10	3-LIVI	Lion's Memorial; Occidental Road at Merced	R	Redwood Lion's Memorial Foundation			17.58	2	A	?	Rr, Ap, Af	WhA	P	C	1	G/79; W/88	R			

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
(V, S), R, Pm	a/A	Z, I?, D				E/?/66 E/?/73 E/?/74 H/0?/88			NABA	PODOP					A, I, C, Rr	H?
S, s, V, v, Us, Ug, F, R	N	Gc			?/3		E/1/88				annual grassland + v.p. flora				Gc, Rr	H?
s, v, Us	a/n	Zh		2	?/2	E/3/86 E/2/88	E/?/86								Ap, Rr	H
s, V, R, r, Us, f	n/a	Zc, I		2	?/3	E/1/79 H/0/81 H/0/88	E/1/79 E/1/81 E/1/88	-		PODOP, RALO, Q.	Fraxinus, Pleuro., Q.	G			Ap, Ai, Z, I	H
s, v, R, Uo, F	a	Av, C, W		2	?/2	-	-	-		PODOP					A, C, D, W	H
s, v, R, Uo	a	Zc		2						RALO	Pleuro. etc.	G			Z, A, I?	H
s, v	n/N	Z, c		2	?/2	E/3/86 E/'0'/88 E/'0'/90	-	-			Ortho., Limn. doug. niv., + annual grasses				Rr	H
s, S, v, Us	n	Zc, Zs, m, T, h	2.9 C	1	30/3	E/4/88 E/6/91 E/6/92 E/3/94	E/1/91 E/1/92 E/1/94	-		RALO, Q.	Pleuro., Plagio., Hord. hys., Lolium, Mentha, Eleoch., Ortho. fauc. + annual grasses		0	D	Rr, Ap, T, m	L/N
S, s, V, v, d, md, Us, Ug	N, n	Zc, M, t	22?	3	50/4+	E/2/88 E/3/91-93	E/6/88 E/5/91 E/6/92 E/6/93 E/6/94	-	NABA	PODOP, RALO, HECO, Q.	Pleuro. cal., Down. con., Plagio. bract., Mentha, LIVI, Eleoch., Rumex, Call., Hord. hys.		CTS	C, D	Rr, Pr, Z, M, t, d	N
s, v, Us	n/N	Zh	2.9	3	40/3	-	E/2/79 E/?/80 E/3/83 E/5/88	-		PODOP, RALO, Q.				D	Rr, A, t	H

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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26D 06	035-141-13	2-LIVI	Finley at Wright	S	USA		RR-B6		1	V		Rr, V	WhA	s, P	C	0	H/75; H/84, G/84; W/88; P/91-94	R, D		
26D 07	none	22-LIVI	Caltrans ROW, Fulton at Ocidental	R	Caltrans				0	V		Pu	CfA, WhA	P	C	0	W/88; P/90	R		
26D 08	none	24-LIVI	Caltrans ROW, Hwy 12 at LLano	R	Caltrans				1	V, Pu		Af, Pu	WhA	P	C	o	T/83; W/88	R		
26D 09	035-141-21		Naval Air Station, NE	S	Santa Rosa Associates II				0	V	Ru	Ru, C/I	WhA	s, P	C	1	G/81; W/88; P/89-93	R, D		
26D 10	35-063-09 through 16 35-102-09, 10, 15, 16, 20, 23, 25, 26; 35-160-26		Courtside Village	S	misc.					Rr	Ru	Rr, C/I								
26D 11	035-063-05		'Martin homeless shelter' site	S				5.2	1	V		Rr, C/I					P/93	R		
26D 12			Gordon Creek	U	Stonehedge Group ??				0	Rr	Ru	Rr, Ru		s, P			P/	D		
26D 13	034-110-66		'Fulton Road at canal'	U	Sequoia Park Associates		R2 BG	28.60	0		Ru						P/89	D		
26D 14	subdivided		Country Manor Estates	R	misc.					Ru		Rr, Ru, Af								
26D 15	036-121-42		Guerneville Road, east of Fulton	U				3.59		V	Ru ?	Ru, C/I					P/90, 91	D		

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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26D 16	034-121-34 034-121-56 034-121-58		1560 and 1554 Fulton Road	U	Singleton, Correira, +1			2.95 +		Rr, Ap	Ru	Ru					P/91, 93	D		
26D 17			(MW D26 W03)	R													W/			
26D 18			'south of Matter'	R						Rr										
26D 19			north side Hall Road (MW D26 W01)	R													W/			
26D 20			south of golf course (MW D26 W01)	R																
26D 21	historic site, exact location unknown	15-LABU	Occidental Road, E. of Sanford Road (same as "Occid. Rd. W of Piezzi" ?)							Rr										
26D 22	35-041-30 35-041-27		Irwin Lane south	R				10.83									P/94	R, P		
26D 23	035-042-33		Irwin Lane, east side, north of Occidental (Coldwell Banker)	R				8.02		V	Rr	Rr, Ap					P/93	R		
26D 24			(MW D26 W02)	R													W/			
26E	060-060-55 060-060-57 060-060-58	6-LIVI 7-BLBA	Carinalli's east end duck pond	L	Carinalli		AE - B6 - F1	172.95	2	A		A	CeA, CfA, CrA, WoA	s, P, f	C		R/74; G/79, 85, 86, 90	R	G/UC	

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
v, Us	N	(Z), t, v, W, O	0.6?	2	50/1	-	E/3/86, 88, E/4/ 90, E/2/ 91, E/3/ 92,93,94	-		RALO	Pleuro, Eleoch. Limn. doug., LIVI, Down. con., Plagio., Lilaea, Mentha, Lol., Hord.		CTS	D	V, T, W	H/N
s, v, Ug	A	G, F, d, Pu, O	?			-	E/1/88 H/'0'/90 X?	-							Pu, O	L
S	A	Pu, O			?/1	-	E/1/83 E/1/88	-			Juncus, Mentha, Q.				Pu, I, T	L
S, s, v	n	T, W, d, O	1.65	2	50/2	-	-	-		(PODOP ?)	Lolium, Hord. hys., Rumex, Mentha		CTS	D	Ru, T, W	H/N
	A, a	Rr, t, w, H, g, f, v					E/0/91? E/1/92 X?/0/93								Rr, t, w, H, g, f, v	
s, v	n	Rr	0.2 C			-	-	-								
0	A		0			-	-	-								
v	X		0.5 ?			-	-	-								
w	a	Ru	0.2 ?			-	-	-							Ru	

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*14 Soils — Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system: **S/s:** major / minor surface system, **G/g:** groundwater,**P/p:** perched water table, **F/f:** floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_:** dense surface clay (**Se:** entire profile = clay, **Ss:** compacted surface layer), **B_:** subsurface layer (**Bc:** clay, **Ba:** cemented alluvium, **Bo:** other),
*17 Watershed — **0:** less than 2 ac, **1:** 2-10 ac, **2:** 10-50 ac, **3:** > 50 ac
*18 Years Surv. — Investigator / yr: **P:** Patterson, **W:** Waaland, **G:** Guggolz, **H:** Harrison, **O:** Ornduff, **R:** Rubtzoff, **S:** WESCO, **M:** McCarten, **N:** Northern, **Q:** Quibell, **JS:** Jones & Stokes
*19 Level Surv. — **C:** casual, fence, airplane; **R:** reconnaissance; **D:** detailed (EIR, etc.); **P_:** Data proprietary: data given are from: **Pc:** CNPS, NDDB, **Pg:** gen'l knowledge, lit., or unrestricted access; **Pp:** submitted to an agency; **Pn:** NW Annex. EIR; **Ps:** SW Annex. EIR; **Pa:** air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS:** Calif. Acad. Sci.; **JEP:** Jepson; **DAV:** UC Davis; **UC:** UC Berkeley; **JC:** SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v:** sig./minor vernal pools, **S/s:** swales, **R/r:** riparian, **P/p:** peren. marsh, **M/m_:** meadow (_w: wet, _d: dry), **C/c:** creek, **D/d:** ditch / flood channel, **A/a:** farmed wetlands, **F/f:** floodplain, **W/w:** other wetlands, **N/n:** man-made pond, **U_:** other significant upland habitats (**Ug:** native grassland, **Uw:** wildflowers, **Uo:** oak woodland, **Us:** oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — **N:** natural topog., ± unaltered (**n:** with minor alterations); **A:** hist. sig. altered (**a:** sig. altered, but stabile); **X:** completely graded/converted
*24 Influences — Major influences: **F/f:** major/minor fill, **G/g:** major/minor grading, **Z_:** grazed (_c: cattle, _s: sheep, _h: horses), **Y/y:** livestock yard, **D/d:** disked, **O/o:** mowed, **C/c:** cultiv., **I/i:** irrig., **J/j:** junk, **H/h:** hydrol. altered, **M/m.** manure, **E/e:** exotics, **W:** weeds, **T/t:** thatch, **V/v:** vehicles, **R/r:** residential use, **S:** wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (**C**): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet., **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. — % aquatic/no. of features: **1:** solitary, **2:** 2-5, **3:** 6-15, **4:** >15
*28 LABU — *Lasthenia burkei*: **E:** extant, **X:** extirp., **H:** hist./abund. class: **'0':** none, **0:** <10 plants, **1:** 10-100, **2:** 100-500, **3:** 500-1000, **4:** 1000-5000, **5:** 5000-10,000, **6:** 10,000-100,000, **7:** > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N. bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; (__): historic
*32 Secondary — **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG:** *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig. aquatic invert.s, **Aa:** amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H:** high (land use changes, minor manip.); **M.** medium (some landscape manipulation); **L:** low, major reconfiguration/grading required; **N:** none warranted; **0:** too altered, no real potential

B I O T I C E N V I R O N M E N T

Habitats Present	Naturalness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
	A	Rr	0			-	-	-								
						X?										
						-	-	-								
						E?/86										
S, s, v	N	G													Rr, t, w	H/N
						-	-	-								
s, v, p	a	Gc, Ai, C				E/2/86 E/2/90	E/?/85 E/4/86	E/4/83 E/3/85 E/2/86 E/5/88				G		D	I, D, G	H

*1 Map Code Co. photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s Sonoma County Assessor's Parcel number(s)
*3 EO No. Element Occurrence number with CNDDB (# - Species)
*4 Place Name General location name or description
*5 Geog. Sub- **W**: Windsor, **L**: Laguna, **U**: urban Santa Rosa (SR), **S** SW SR, **N**: NW SR, **E**. E SR, **P**. S SR Plain; **R** rural SR, **C**: Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen Plan ; __/**Co** = county, __/**Ci** = city
*9 Site size Approx acreage of site (generally one parcel)
*10 Contig.with Contig with other significant parcels? **0** = isolated, no other **significant** sites adjacent; **1**: undeveloped land adj , but no sig. wetlands; **2**: 1-3 adj. or < 20 ac sig. adj. land; **3**: 4 or > sig adj. parcels or >20 ac sig. adj. land, **4**: >10 ac sig. adj. **public** land
*11 Current Use A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**. pasture **Ar**: row crops **Av** vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**. urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**. school **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu** public utility**C** / I, commercial/industrial
*12 Prop. Use Proposed or likely future land use(s); (see # 11)
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SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26E 13	060-120-13		Palm Terrace, Sebastopol	L	Selver ? (Selle ?)		F1 - B5	3.99, 16.83	2								W/88			
26E 14	060-120-12		Saddle Burr	L	Poncetta			31.61												
26E 15	060-100-01		'Buccholz' ?	L	Buccholz, Erwin and Paula			5.96												
26F 01	134-051-24	11-LIVI	Todd Road near Llano	R	Landeros		A1 - B6	53.56	2	C/I, Ap	C/I	Ap, Rr	WoA	s, P	C	2	T/83; W/88	R		
26F 02	035-141-21	8-LIVI	Naval Air Station W; swale N of Madera, S of E/W runway	S	Santa Rosa Associates II			246.54	3	V	Ru	Rr	WhA, CfA	s, P	C	1	H/79, 80; G/88; W/88; P/89-94	R, D		P
26F 03	035-141-07		Naval Air Station NW; ' hanger site'	S	Santa Rosa Associates II			38	1	V	Ru	V, C/I	WhA, CfA	P	C	0	H/78, 89; W/88; P/89-93	R, D		
26F 04	035-082-11	8-LIVI	Naval Air Station; 'Madera'	S	Madera Ave. Land Associates			35	2	V	Ru	Rr, V	WhA	S, P	C	2	H/79, 89; P/89-94	R, D	H/JC	P
26F 05	035-151-14 60-040-34	7-LIVI	West end of Concord Road	R	Mello			16.0 106.48	2	A	A	A	WoA	P	C		Q/77; G/80; W/88	R		
26F 06	060-070-23	1-LIVI 8-BLBA	Todd Road 'elbow'	L	Carinalli		A1 - B6	22	3	Ac		Rr, Af, Ap	WoA	S, s, P	C	3	H/74; G/79, 80; W/88; P/90, 92, 94	R		
26F 07	060-060-30	19-LIVI	Todd Road at Llano, SW	L	Lagomarsino		A1 - B6	30.9	3	Ap		Ap, Af, Rr	WoA	s, P	C	3	W/88	R		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v,Uo, R, f, p	n/N	Zc, w			40/3	E/2/88	-	-							Rr, A	?
						E ?										
							E ?									
V, s, Us, Ug	a/n	C/I, w, d, j			?/1	-	E/5/83 E/5/88	-							C/I, Rr, T, d	H
"S", "v", R, r, p, Ug, c	A	(Pu), t, w, d, h	6.1 C	3	40/2	-	E/6/79, 80,83,84 E/4/89-92; E/6/93, 94	-		RALO	Ortho., Plagio., Pleuro., Mentha, Rumex, Down. con.		0	D, C?	d, Ru, t, w	H/N
v, r	a	d, j, w	0.4		90/1	-	-	-		PODOP	Pleuro, mentha, Xanth., Rumex, Hord.		0	D	Ru, C/I, J, W, t, d	M
S, s, V, v, Md, Us, Uw	N, n	d, w, t	7.1	2	60/3	E/2/93	E/?/79 E/?/80 E/4/90-92, E/6/93	-		RALO, Q. PODOP	Pleuro., Down. Ortho., Lilaea, Lolium, Hord., Plagio., Ortho. fauc.		CTS	D	Ru, t, w	N
(s, v)	A	Zc, C, I					E/?/77								Rr, C, I, T, w	L?
S, s, v, mw, c	n	C, t, D, I, O	2+	2	40/2	-	E/?/77, 80,86 E/3/88 E/3/92 E/4/94	E/6/86 E/4/88 E/2/90 E/1/92 E/5/94		RALO	Pleuro., Mentha, Lolium, Lilaea, Plagio., Down., Alisma			D, C?	Rr, C, I, D, T, w	H
S, s, v, Us	a	Zc, f, I				-	E/2/88	-						D	C, I, T, W, Rr, Z	H

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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26F 08	060-060-48	10-LIVI	Laguna at RR bridge; 'behind Sebastopol campground'	L	City of Santa Rosa		F1 - B6		2	Af, Ai		Ap, Ai	BcA	F		3?	R/69, 74; G/79, 80; W/88	R		
26F 09	060-060-53	1-LABU 14-BLBA 19-LIVI	Todd Road Preserve	L	CDFG, Wildlife Conservation Board			75	3	Pc	Pc	Af, Ai, Ap	CfA, WoA	s, P	C	2, 3	G/74, 79; Q/77; W/88; P/87, 90, 91, 94	R, D		
26F 10	060-060-55	14-LABU 25-LIVI 12-BLBA	Dom. Carinalli easement	L	Carinalli/CDFG				2	A		A	CeA, CfA, CrA, WoA	S, P, F		3?	R/74; G/74, 79, 85, 86; W/88	R	G/UC	
26F 11	060-010-15 060-010-16		Hofbauer easement, Laguna	L	Locklear		F1 - B5		2	A		A		S, F		3?	W/88	R		
26F 12	035-182-01	5-LIVI	Between Pyle Ave. and Kirby, E of S. Wright	S	Mosier			4.15, 3.75, 4.52	2	V	Rr	Rr, A					H/88; W/88	R		
26F 13	134-232-13		Walker Road near Colgan Creek	P	Haller			16	2	Ap		A	WoA, WhA	P, f			G/84; W/88	C, R		
26F 14	035-211-23		Broadmoor Acres North	S	Santa Rosa City Schools			14.29	3	Pc	Pc	Rr, V	WhA	s, P	C	1	W/88; H/89; P/91-93	R, D		
26F 15	134-211-07		Scenic at Arlington	P													W/88			
26F 16	134-151-26		Colgan Creek pasture near Todd	P													W/88			
26F 17	134-051-12 134-051-13 134-051-09		'Beretta'	R	Beretta		AE - B6	90.46, 318.58, 4.13	3	Rr, Ap, Ai, Af	Ai ?	Ap, Ai, Af, Rr	WoA, WhA, CfA	S, s, P	C	3	W/93	R		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
R, F, s, v, p, Us, Uo	a/n	Z, C, I, m, w, O				E/1/88	E/?/74, 77, 79, 80, 83 E/1/88	-				G		D, C, M, B?	Rr, Ar, Ap	H
S, s, V, v, Us, Ug, Mw	N	Zh, w, T		2	40/2	E/1/74 E/1/87 E/5/88 H/'0'/90 ,91,94	E/?/79, 80; E/6/ 83; E/3/ 87; E/5/ 88, 90	E/3/88 E/4/90 E/3/94		PEGAG ? RALO	Pleuro., Down., Ortho. fauc., Lolium, Hord., Eleoch., Lasth. glab., Blenno. nanum	G, H			T, w	H/N
s, V, v, p, Us, F, W	n/N	Zc, Ai				E/5/88 E/5/90	E/6/88	E/1/74 E?/0/86				G, H			Zc, t, w	H
F, p, v, s, Ug, Us	a/n	Zc, j, w			?/2	-	E/2/88	-							C, I, J, Z	H
Us, w	n	t, w					E/?/80			(PODOP?)					C/I, Ru, W	M
s, v?	a	Zc				-	E/4/84E /3/88	-		RALO					Zc, m, t	H
s, v, V,Ug, Us, m	n/N	Z, Rr, t, d	3	2	30/2	-	E/4/88 E/4/91 E/3/92 E/1/93	-		RALO, PODOP, Q.	Pleuro., Down., Mentha, Hord. hys., Lolium, Rumes, Call., + Lippia		CTS	D	Rr, t, w, d	H
v, s	A	D, w					E/1/88								Ap, Z	
S, s, v							E/2/88								Ap, Z	M?
S, s, V, v, Us, Uo	N, n	Zc, C, I, t, m		3	50/4		E/6/88 E/6/93	E/6/88 E/6/93		RALO					Ap, Ai, Zc, I, C	H, N

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*4 Place Name — General location name or description
*5 Geog. Sub- — W: Windsor, L: Laguna, U: urban Santa Rosa (SR), S SW SR, N: NW SR, E: E SR, P: S SR Plain, R: rural SR, C: Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen Plan, _/Co = county, _/Ci = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig with significant — Contig. with other significant parcels? 0 = isolated, no other sites adjacent; 1: undeveloped land adj., but no sig. wetlands; 2: 1-3 adj. or < 20 ac sig. adj. land; 3: 4 or > sig. adj. parcels or >20 ac sig. adj. land; 4: >10 ac sig. adj. public land
*11 Current Use — A = Agriculture Aw: wastewater Ao: orchard Ap: pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr: rural Ru: urban. V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp: wastewater pond, Pi: wastewater irrigation, Pu: public utility C / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s); (see # 11)
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*16 Restr. Layer — Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss: compacted surface layer), B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other).
*17 Watershed — 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. — Investigator / yr: P: Patterson, W: Waaland, G: Guggolz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. — C: casual, fence, airplane; R: reconnaissance, D: detailed (EIR, etc.); P_: Data proprietary: data given are from: Pc: CNPS, NDDB; Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d: dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural — N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences — Major influences. F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland. 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet., 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. — % aquatic/no. of features. 1: solitary, 2: 2-5, 3: 6-15, 4: >15
*28 LABU — *Lasthenia burkei*: E: extant, X: extirp., H: hist./abund. class: '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida*; (__): historic
*32 Secondary — DOHU: *Downingia humilis*, RALO: *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., AI: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: H: high (land use changes, minor manip.); M: medium (some landscape manipulation); L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26F 18	134-051-08 134-051-15		'Heskett'	R	Giannecchinni ('Heskett' ?)			21.33, 16.19	2				WhA, CfA	s, P	C		W/?			
26F 19	063-150-24		Glade Farm	L	Glade, Alvin and Janet			16.40	3	A		A					W/92	D		
26F 20			Mills Farm	R	Mills, Sandy				2	A							W/89-93	D		
26F 21			Brown Farm	L	City of Santa Rosa				2			Ai					W/91-93	D		
26F 22	035-141-03		'FEMA'	S	USA			61.29	2	V	Pc	V, Ap	WhA, CfA	s, P	C	2	W/90; J&S/93; P/92-94	D, R		
26F 23	035-211-19		Broadmoor Acres South	S	B.T. Land Development Corp. (Tuxhorn)			13.49	0	V	R	Rr	WhA	s, P	C	1	W/88; H/89; P/91-94	R, D		P
26F 24	35-141-21		Air Center south	S	Santa Rosa Associates II (Ersted)				2	V	Ru	Rr, V	WhA	s, P	C	0	P/89-94	D		
26F 25	035-201-45 035-201-46 035-201-47		Fisher, south of Pyle (part of Springfield ?)	S	Landis, Lennon, McNutt			2.24, 2.25, 3.92	2	Rr	Ru? Pc?	Rr		P	C		H/83	R	H/JC	
26F 26	35-201-06; 07; 11; 12; 14; 28; 29; 30; 31; 37; 38; 40; 41; 45; 46; 47; 35-211-11		'Springfield' (minus Landis, Lennon, McNutt)	S	misc.					Rr	Ru	Rr	WhA	s, P	C		P/92, 94	D		
26F 27	134-051-16 134-051-05		'Lystra'	R	Lystra			33.93, 16.19	2				WoA	s, P	C					

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
S, s, V, Us, Uo	N	Zc			50/4	-	E/6/?	E/5/?		PODOP, RALO, DOHU					Ap, Zc	H
s, R, Us	n	Zc, I			50/2	-	E/3/92	-							Ap, Ai, Zc,I	H
S, V, v, Us	N	Zs, M, W, Rr	1.5	3	50/3	-	E/6/? X?/?/93 ?	-							Ap, Zs, M, W, Rr	H
s, v, Us	N	I, M, W, O			50/2	-	E/2/92 E/3/93?	-							Af, Ai, I, M, W	H
S, V, v, w	A	C/I, T,	14.1 C	2	80/2	-	E/4/90 E/5/93	-		PODOP, RALO, Q.	Lolium, Pleuro., Alisma, Rumex, Mentha, Hord.		CTS, LO	D	T, w, V	H
s, v, d	n	(Z), w, t	2	2	30/2	-	E/?/89 E/3/91 E/4/92 E/4/93	-								
s, v	a	t, H, v, G	0.76		20/1	-	E/2/94	-							t, w, Ru, h, v	M
s, v	N, n	Z					E/?/83	E/?/83		PODOP					Rr, A	H
s, d	A	Rr, Z				-	E/2/92	-		RALO					Ru, A, W, T, M	L
s, v							E/?/?									

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*8 Zoning — Zoning/Gen.Plan ; __/Co = county, __/Ci = city
*9 Site size — Approx acreage of site (generally one parcel)
*10 Contig with — Contig with other significant parcels? **0** = isolated, no other **significant** sites adjacent, **1**: undeveloped land adj., but no sig. wetlands, **2**: 1-3 adj. or < 20 ac sig. adj. land, **3**: 4 or > sig adj. parcels or >20 ac sig. adj. land; **4**: >10 ac sig. adj. **public** land
*11 Current Use — A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**: pasture **Ar**: row crops **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**: school **Pp**: wastewater pond, **Pl**. wastewater irrigation, **Pu**. public utility C / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s), (see # 11)
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*14 Soils — Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. — Primary hydrologic system. **S/s**: major / minor surface system, **G/g** groundwater, **P/p**: perched water table, **F/f** floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_**: dense surface clay (**Se**: entire profile = clay, **Ss**. compacted surface layer), **B_**: subsurface layer (**Bc**: clay, **Ba**: cemented alluvium, **Bo**: other),
*17 Watershed — **0**: less than 2 ac, **1**: 2-10 ac, **2**: 10-50 ac, **3**. > 50 ac
*18 Years Surv. — Investigator / yr: **P**: Patterson, **W**: Waaland, **G**: Guggolz, **H**: Harrison, **O**: Ornduff, **R**: Rubtzoff, **S**: WESCO, **M**: McCarten, **N**: Northern, **Q**: Quibell, **JS**: Jones & Stokes
*19 Level Surv. — **C**: casual, fence, airplane, **R**: reconnaissance, **D**: detailed (EIR, etc.); **P_**: Data proprietary: data given are from: **Pc**: CNPS, NDDB, **Pg**: gen'l knowledge, lit., or unrestricted access; **Pp**: submitted to an agency; **Pn**: NW Annex. EIR; **Ps**: SW Annex. EIR; **Pa**: air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS**: Calif. Acad. Sci.; **JEP**: Jepson; **DAV**: UC Davis; **UC**: UC Berkeley; **JC**: SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v**: sig./minor vernal pools, **S/s**: swales, **R/r**: riparian, **P/p**: peren. marsh, **M/m_**: meadow (_w: wet, _d dry), **C/c**: creek, **D/d**: ditch / flood channel, **A/a**. farmed wetlands, **F/f**: floodplain, **W/w**. other wetlands, **N/n**: man-made pond, **U_**: other significant upland habitats (**Ug**: native grassland, **Uw**: wildflowers, **Uo**: oak woodland, **Us**: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — **N**: natural topog., ± unaltered (**n**: with minor alterations); **A**: hist. sig. altered (**a**: sig. altered, but stable); **X**: completely graded/converted
*24 Influences — Major influences. **F/f**: major/minor fill, **G/g**: major/minor grading, **Z_**: grazed (_c. cattle, _s: sheep, _h horses), **Y/y**: livestock yard, **D/d**: disked, **O/o**: mowed, **C/c**: cultiv., **I/i**: irrig., **J/j**: junk, **H/h**: hydrol. altered, **M/m**: manure, **E/e**: exotics, **W**: weeds, **T/t**: thatch, **V/v**: vehicles, **R/r**: residential use, **S**: wastewater; (__): hist.
*25 Acres Wet — Est. wetland acreage (**C**): confirmed by Corps of Eng.
*26 Wet./Up. — Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet., **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. — % aquatic/no. of features: **1**: solitary, **2**: 2-5, **3**: 6-15, **4**. >15
*28 LABU — *Lasthenia burkei*: **E**. extant, **X**: extirp., **H**: hist./abund. class. **'0'**: none, **0**: <10 plants, **1**: 10-100, **2**: 100-500, **3**: 500-1000, **4**: 1000-5000, **5**: 5000-10,000, **6**: 10,000-100,000, **7**: > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL**: *Navarretia pleiantha*, **NABA**: *N bakeri*, **ALAES**: *Alopecurus aequalis sonomensis*, **TRAM**: *Trifolium amoenum*, **PLHO**: *Pleuropogon hooverianus*, **CAAL**: *Carex albida* ; (__): historic
*32 Secondary — **DOHU**: *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP**: *Pogogyne doug. parv.*, **PEGAG**: *Perideridia gairdneri g.*, **HECO**: *Hemizonia congesta*, **Q**: *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS**: CA tiger salamander, **LO**: CA linderiella, **VPS**: v. p. shrimp, **FS**: freshwater shrimp, **R**: raptors, **W**: waterbirds, etc., **Ai**: sig. aquatic invert.s, **Aa**: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C**: crayfish, **B**: bullfrogs, **M**: mosquito fish, **D**: dogs/cats; **L**: *Lippia*, **P**: *Phalaris*, **X**: *Xanthium*, **G**: grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. — Pot. for restor.: **H**: high (land use changes, minor manip.); **M**: medium (some landscape manipulation); **L**: low, major reconfiguration/grading required, **N**. none warranted; **0**: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26F 28			Todd Road at Llano, SE (MW 26FW02)	R																
26F 29	060-070-22 060-070-23 060-070-24		Carinalli south of Todd Road	L	Carinalli, C.		DA BG 40ac	62	3	Af		A	WoA, CfA	s, P	C	2	P/93, 94	R		
26F 30	134-232-20 ?		'Benkelman' on Colgan Creek channel	R	Benkelman ?			4 ?	3											
26F 31	134-232-11 134-232-21		'Bennett mitigation site' on Colgan Creek channel, east of Walker Road	R	Tesconi, to be dedicated to CDFG					V	Pc	Rr, Ap								
26F 32			(MW 26F W04)	L																
26F 33			(MW 26F W05)	L																
26F 34	134-051-25 134-051-26		'Hale'	R	Hale			81.78, 34.53	3	Ap		A	ZaB, WoA	s, v	C	2	H/79	R	H/JC	
26F 35			(MW 26F W09)	L						Ai										
26F 36			(MW 26F W01)	L																
26F 37			(MW 26F W08)	L						Ai										

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
S, s, A, w, Us	a	D, C, I														H
							E/?/?									
	a?															
						-	-	-								
						-	-	-								
S, s, v	n	Z, t		2			E/?/79	E/?/79							Z, I?, t	H/N?
						-	-	-								
						-	-	-								
						-	-	-								

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*5 Geog. Sub- — **W:** Windsor, **L:** Laguna, **U:** urban Santa Rosa (SR), **S** SW SR, **N:** NW SR, **E.** E SR, **P** S SR Plain, **R:** rural SR; **C:** Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen Plan ; _/Co = county, __/Ci = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig.with — Contig. with other significant parcels? **0** = isolated, no other significant sites adjacent; **1:** undeveloped land adj., but no sig. wetlands; **2.** 1-3 adj. or < 20 ac sig. adj. land; **3.** 4 or > sig adj. parcels or >20 ac sig. adj. land; **4:** >10 ac sig. adj. **public** land
*11 Current Use — A = Agriculture **Aw:** wastewater **Ao** orchard **Ap**: pasture **Ar:** row crops **Av:** vineyard, **Ai:** irrigated, **Af:** hayfield, R = Residential **Rr:** rural **Ru:** urban. V = Vacant P = Public **Pc:** conservation, **Pr:** recreation, park, **Ps:** school **Pp:** wastewater pond, **Pi:** wastewater irrigation, **Pu:** public utilityC / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s); (see # 11)
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*15 Hydrol. Sys. — Primary hydrologic system: **S/s.** major / minor surface system, **G/g:** groundwater,**P/p:** perched water table, **F/f:** floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_** dense surface clay (**Se:** entire profile = clay, **Ss:** compacted surface layer); **B_**: subsurface layer (**Bc:** clay, **Ba:** cemented alluvium, **Bo:** other),
*17 Watershed — **0:** less than 2 ac, **1:** 2-10 ac, **2:** 10-50 ac, **3:** > 50 ac
*18 Years Surv. — Investigator / yr: **P:** Patterson, **W:** Waaland, **G:** Guggolz, **H:** Harrison, **O:** Ornduff, **R:** Rubtzoff, **S:** WESCO, **M:** McCarten, **N:** Northern, **Q:** Quibell, **JS:** Jones & Stokes
*19 Level Surv. — **C:** casual, fence, airplane; **R:** reconnaissance, **D:** detailed (EIR, etc.); **P_**: Data proprietary: data given are from: **Pc:** CNPS, NDDB; **Pg:** gen'l knowledge, lit., or unrestricted access; **Pp:** submitted to an agency; **Pn:** NW Annex. EIR; **Ps:** SW Annex. EIR; **Pa:** air photos
*20 Vouchers — Voucher? (see # 18) / receptor site: **CAS:** Calif. Acad. Sci.; **JEP:** Jepson; **DAV:** UC Davis; **UC:** UC Berkeley; **JC:** SR JC / year
*21 Photos — Reference photos available ? (see # 18 for symbols)
*22 Habitats — Habitats: **V/v:** sig./minor vernal pools, **S/s:** swales, **R/r:** riparian, **P/p:** peren. marsh, **M/m_**: meadow (_w: wet, _d: dry), **C/c:** creek, **D/d:** ditch / flood channel, **A/a:** farmed wetlands, **F/f:** floodplain, **W/w.** other wetlands, **N/n:** man-made pond, **U_**: other significant upland habitats (**Ug:** native grassland, **Uw:** wildflowers, **Uo:** oak woodland, **Us:** oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. — **N:** natural topog., ± unaltered (**n:** with minor alterations); **A:** hist. sig. altered (**a:** sig. altered, but stabile); **X:** completely graded/converted
*24 Influences — Major influences: **F/f:** major/minor fill, **G/g:** major/minor grading, **Z_**: grazed (_c: cattle, _s: sheep, _h. horses), **Y/y:** livestock yard, **D/d:** disked, **O/o:** mowed, **C/c:** cultiv., **I/i:** irrig., **J/j:** junk, **H/h:** hydrol. altered, **M/m:** manure, **E/e:** exotics, **W:** weeds, **T/t:** thatch, **V/v:** vehicles, **R/r:** residential use, **S:** wastewater; (__): hist.
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*26 Wet./Up. — Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet., **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. — % aquatic/no. of features: **1:** solitary, **2:** 2-5, **3:** 6-15, **4:** >15
*28 LABU — *Lasthenia burkei*: **E:** extant, **X:** extirp., **H:** hist./abund. class: '**0**': none, **0:** <10 plants, **1:** 10-100, **2:** 100-500, **3:** 500-1000, **4:** 1000-5000, **5:** 5000-10,000, **6:** 10,000-100,000, **7:** > 100,000 / year
*29 LIVI — *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA — *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. — Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N. bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; (__): historic
*32 Secondary — **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG**: *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; (__): hist.
*33 Dom. pl. — Brief listing of dominant plants
*34 Spp. List — Plant species list available? (see # 18)/year
*35 Sens. Wild. — **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig. aquatic invert.s, **Aa:** amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics — Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats — Perceived threats (see codes for # 11 and 24)
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SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
26F 38			(MW 26F W03)	L																
26F 39			(MW 26F W10)	L																
26F 40			(MW 26F W11)	L																
26F 41			(MW 26F W07)	R																
26F 42			(MW 26F W06)	R																
26F 43			(MW 26F W12)	R																
27A 01			Evergreen	R	Summertree Development ?				2	V	Ru, Pc	Rr, Ru	ZaA, YsA	s, P	C	1	P/91, 93; S/?	D		
27A 02	58-050-51		'Christian Life Center' (Anderson site, south of Evergreen)	R				21		V	C/I	V, Rr	ZaB				P/92	D		
27A 03			3975 Old Redwood Highway ('Evans Co. site' east of Hwy 101)	R				19		C/I, V	C/I	C/I, V					P/91	D, P		
27A 04			IMCO site ? ('Evans Co. site' west of Hwy 101)	R				13	0	V	C/I	C/I					P/91	D, P		

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
						-	-	-								
						-	-	-								
						-	-	-								
						-	-	-								
						-	-	-								
						-	-	-								
S, Uo	a	Ao, w, t, V, J				-	-	-			Lolium, Hord., Rumex			D	Ru, h, V	
	A	F, W, H	0			-	-	-			Lolium, Avena, Vicia, Bacch.			D		0
	A	C/I, H, G, F, w				-	-	-								
	A	G, F, H				-	-	-								

*1 Map Code — Co. photo # + sequential # (contin from Waaland, '89)
*2 A.P. No.s — Sonoma County Assessor's Parcel number(s)
*3 EO No. — Element Occurrence number with CNDDB (# - Species)
*4 Place Name — General location name or description
*5 Geog. Sub- — **W**: Windsor, **L**: Laguna, **U**: urban Santa Rosa (SR), **S** SW SR, **N**: NW SR, **E**: E SR, **P**: S SR Plain, **R**: rural SR; **C**: Cotati
*6 Owner — Owner of site
*7 City Photo — Flight line number, SR city air photo (200-scale)
*8 Zoning — Zoning/Gen Plan , __/Co = county, __/Ci = city
*9 Site size — Approx. acreage of site (generally one parcel)
*10 Contig with — Contig. with other significant parcels? **0** = isolated, no other significant sites adjacent; **1**: undeveloped land adj., but no sig. wetlands, **2**. 1-3 adj. or < 20 ac sig. adj. land, **3**: 4 or > sig adj. parcels or >20 ac sig adj. land; **4**: >10 ac sig. adj. **public** land
*11 Current Use — A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**: pasture **Ar**: row crops **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**: school **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utilityC / I: commercial/industrial
*12 Prop. Use — Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses — Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils — Dominant soil (see SCS '72), (**H**). on Co. hydric soils list
*15 Hydrol. Sys — Primary hydrologic system. **S/s**: major / minor surface system, **G/g**: groundwater,**P/p**: perched water table, **F/f**. floodplain
*16 Restr. Layer — Restrictive soil layer ? **S_**: dense surface clay (**Se**: entire profile = clay, **Ss**: compacted surface layer); **B_**: subsurface layer (**Bc**: clay, **Ba**: cemented alluvium, **Bo**: other),
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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
27C 01			El Rancho Tropicana	E						C/I		Ru, Ap								
27C 02	part of highway easement/right of way ?		'Ring' site on Highway 12	U						Pu		C/I, Ru					P/92	D		
27C 03	125-252-02; 03; 04; 125-331-01		Southcreek Village	U	Stagecoach Development ?			19.3		Rr, V	Ru	Ru					P/90, 93	D, P		
27C 04	125-361-03		Burbank Ave. Condominiums (Stembridge Stables)	U	Neuschatz			5.0		Rr, Ahy	Ru	Ru					P/92, 93	D		
27C 05	035-132-37		Pero Apartments (Giffen at Stony Pt Rd.)	S	Pero			1.3	1	V	Ru	Rr, Ru		P			P/92, 93 .	D		
27C 06			Giffen Estates	S	Gasperini ?			5.6	1	Rr	Ru	Rr, Ru, C/I		P			P/92, 93	D, P		
27C 07			'City fire station site'	S	Crty of Santa Rosa ?			0.8	0	V	Pu	C/I					P/92	D		
27E 01	134-162-09		Primrose Ave., SW SR	P	Young, Geo. (Agnese)		RR - B6		2	Ap							W/88			
27E 02	134-171-02	17-BLBA	Todd Road at Primrose	P	Cholomi, Michael (Martinez)		RR - B6		2	Ap, V		Ap, Rr	WoA	P	C	0	W/88; P/90	R		
27E 03	045-011-03	14-LIVI 17-BLBA	Scenic at Whistler	P	Karami (Drachman)		RR B6		2	V, A		Ap, Af, Rr	CeA, WoA	s, P	C	0	RT/75; JR/83; G/86; W/88; P/90	R	RT/SSC	

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
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	a	Af, h, t													Ru, C/I, H	
	X					-	-	-								
	a	Rr, t, w,v				-	-	-								
	A	Zh, h, Ap	0 C			-	-	-								
	a	O, T	0			-	-	-								0
	A, f, w, T, h															
c	a		0.2			-	-	-								
v	N	Z						E/5/88								
s, v	n	Z, m, W, T	0.5?	1	40/2	-	-	E/3/88 E/'0'/90			Pleuro., Rumex, Las. glab., Lolium, Hord.			D	Rr, C, f?, D, Z, W, T	M?
s, v, Us	a/n	Z, W, T, d, Rr, f	0.3?	1	50/1	-	E/?/75 E/?/83 E/2/86 E/3/88 E/1/90	E/1/88 E/1/90		RALO	Pleuro., Rumex, Lolium, Hord., Mentha, Down. con.			D	Rr, T, D, F, C, I?	M

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*11 Current Use A = Agriculture Aw: wastewater Ao orchard Ap pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr: rural Ru: urban V = Vacant P = Public Pc: conservation Pr recreation, park, Ps: school Pp: wastewater pond, Pi wastewater irrigation, Pu public utilityC / I, commercial/industrial
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*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
27E 04	045-022-20	12-LIVI 18-BLBA	Horn Ave. north, near Santa Rosa Ave.	E	Uccelli		RR - B6		0	V	Ru?	Ru, A	CeA	s	C	1	Q/74; H,G/79; W/88 P/90	R		
27E 05	045-041-26	3-LIVI 18-BLBA	Horn Ave. south, near Santa Rosa Ave.	E	McDowell		A1 - B6		0	V, A	Ru?	Ru, A	CeA	s	C	1	Q/74; G/79; W/88; P/90	R		
27E 06	134-222-01		Scenic and Hargrave	E	Schmalen et al				2	Ap		A, Rr	WhA	s, P	C		W/88			
27E 07	numerous partial parcels in right of way		West Robles Conduit ROW	P	misc.				3	Rr, Af, Ap		A	WoA, CfA, WhA	s, P	C		P/92-94	D		
27E 08			Primrose Ave. east side (previously 'Del Bucchia')	P					2	Rr		Rr, A	WoA	P	C		P/92	D		
27E 09	134-042-02, 03, 04, 05, 22, 38, 230 134-290-010 043-072-05 134-30-18, 22		Bellevue Ranch	S	B.T. Homes (Tuxhorn)			94.52	2	Af	Ru	Rr, Ru, Ps, Ap	ZaA, CeA, CfA	s, P	C	2	P/92-94	D		
27E 10			Elsie Allen High School	S	Santa Rosa Schools			40 ?	2	Ps		Rr, Af					P/91-92	D		
27E 11			'Wong'	S	Wong			12	2	Rr, Gf		Ps, Rr	CfA				P/91-92	D		
27E 12			Bellevue at South Dutton, NW	S						V	Ru?	Rr, A	CfA	P	C	0	P/94	R, P		
27E 13	035-191-06 035-191-09 035-191-10		Northpoint Village ('Summerfield')	S	Martin			61.27	2	Ap	Ru, Pc	Rr, C/I, V	WhA, CfA	s, P	C	2	P/89-94	D		P

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
(s, v)	A	C, D, G, h, J, V, O			?/2	-	E/7/80, 83; H/'0'/88; X/'0'/89, 90	E/?/77? E/7/80, 83; X/'0'/88 89,90			Lolium, Hordeum, Bromus, Brassica, Avena, Erodium			D	Ru, A, I	M
(s, v)	A	C, D, V, O			?/2	-	E/?/74? E/5/79 X/'0'/88 X/'0'/90	-			Lolium, Hordeum, Bromus, Brassica, Avena, Erodium			D	Ru, A, I, C	L
s, v	n	Zc			?/2	-	-	E/5/88								
S, s, v	a, d, f	Gc, Gh, m, t				-	-	-		RALO, PODOP				D	Rr, Ah, G	H
s	n	Rr				-	-	-							Rr	M
s, v	A, Z	C, D, h, T	0.17 C	0	80/1	-	-	-			annual grasse + Down., Plagio., Pleuro.		<LO, CTS>	D	Ru	L
(s, v)	X															
s, v, w	a	G, F, d	6 C	3	20/1	-	-	-			Pleuro., Hord. Juncus, Plagio., Mim. tri., Lolium, Lilaea, Perid. kell.		<LO, CTS>	D	G	L/N
	A	H, G, f, t, w													Ru	
s, v, V, d	a	Zc, Zs, M, t, w, H	1.0 C	1	50/2	-	E/	-		PODOP, RALO, Q.	Pleuro., Down. con., Plagio. bract., Mentha, Eryng. arist., Lolium, Hord. hys.		LO	D, C	Ru, Z, m, w, t	M

*1 Map Code Co photo # + sequential # (contin. from Waaland, '89)
*2 A.P. No.s Sonoma County Assessor's Parcel number(s)
*3 EO No. Element Occurrence number with CNDDB (# - Species)
*4 Place Name General location name or description
*5 Geog. Sub- W: Windsor, L. Laguna, U. urban Santa Rosa (SR), S SW SR, N: NW SR, E. E SR, P. S SR Plain, R: rural SR, C: Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen.Plan ; _ /Co = county, _/Ci = city
*9 Site size Approx. acreage of site (generally one parcel)
*10 Contig.with Contig. with other significant parcels? 0 = isolated, no other significant sites adjacent; 1: undeveloped land adj., but no sig wetlands, 2: 1-3 adj. or < 20 ac sig. adj. land, 3: 4 or > sig. adj. parcels or >20 ac sig. adj. land; 4: >10 ac sig. adj. public land
*11 Current Use A = Agriculture Aw: wastewater Ao: orchard Ap: pasture Ar: row crops Av: vineyard, Ai: irrigated, Af: hayfield, R = Residential Rr: rural Ru: urban. V = Vacant P = Public Pc: conservation, Pr: recreation, park, Ps: school Pp. wastewater pond, Pi wastewater irrigation, Pu: public utilityC / I. commercial/industrial
*12 Prop. Use Proposed or likely future land use(s), (see # 11)
*13 Adj. Uses Predominant adjacent land uses; (see # 11 for symbols)
*14 Soils Dominant soil (see SCS '72); (H): on Co. hydric soils list
*15 Hydrol. Sys. Primary hydrologic system: S/s: major / minor surface system, G/g: groundwater,P/p: perched water table, F/f floodplain
*16 Restr. Layer Restrictive soil layer ? S_: dense surface clay (Se: entire profile = clay, Ss. compacted surface layer). B_: subsurface layer (Bc: clay, Ba: cemented alluvium, Bo: other),
*17 Watershed 0: less than 2 ac, 1: 2-10 ac, 2: 10-50 ac, 3: > 50 ac
*18 Years Surv. Investigator / yr: P: Patterson, W: Waaland, G. Guggolz, H: Harrison, O: Ornduff, R: Rubtzoff, S: WESCO, M: McCarten, N: Northern, Q: Quibell, JS: Jones & Stokes
*19 Level Surv. C: casual, fence, airplane; R: reconnaissance, D: detailed (EIR, etc); P_: Data proprietary: data given are from: Pc: CNPS, NDDB, Pg: gen'l knowledge, lit., or unrestricted access; Pp: submitted to an agency; Pn: NW Annex. EIR; Ps: SW Annex. EIR; Pa: air photos
*20 Vouchers Voucher? (see # 18) / receptor site: CAS: Calif. Acad. Sci.; JEP: Jepson; DAV: UC Davis; UC: UC Berkeley; JC: SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: V/v: sig./minor vernal pools, S/s: swales, R/r: riparian, P/p: peren. marsh, M/m_: meadow (_w: wet, _d dry), C/c: creek, D/d: ditch / flood channel, A/a: farmed wetlands, F/f: floodplain, W/w: other wetlands, N/n: man-made pond, U_: other significant upland habitats (Ug: native grassland, Uw: wildflowers, Uo: oak woodland, Us: oak savanna). (__): historic; "__" = man-made habitat
*23 Natural. N: natural topog., ± unaltered (n: with minor alterations); A: hist. sig. altered (a: sig. altered, but stabile); X: completely graded/converted
*24 Influences Major influences: F/f: major/minor fill, G/g: major/minor grading, Z_: grazed (_c: cattle, _s: sheep, _h: horses), Y/y: livestock yard, D/d: disked, O/o: mowed, C/c: cultiv., I/i: irrig., J/j: junk, H/h: hydrol. altered, M/m: manure, E/e: exotics, W: weeds, T/t: thatch, V/v: vehicles, R/r: residential use, S: wastewater; (__): hist.
*25 Acres Wet Est. wetland acreage (C): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: 0 = trace wet. or less than 5 % of site, 1 = 5-10 % wet , 2 = 10-20 %, 3 = 20-50%, 4 = > 50 %
*27 Wet. Break. % aquatic/no. of features. 1: solitary, 2. 2-5, 3. 6-15, 4: >15
*28 LABU *Lasthenia burkei*: E: extant, X: extirp., H. hist /abund. class '0': none, 0: <10 plants, 1: 10-100, 2: 100-500, 3: 500-1000, 4: 1000-5000, 5: 5000-10,000, 6: 10,000-100,000, 7: > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: NAPL: *Navarretia pleiantha*, NABA: *N. bakeri*, ALAES: *Alopecurus aequalis sonomensis*, TRAM: *Trifolium amoenum*, PLHO: *Pleuropogon hooverianus*, CAAL: *Carex albida* ; (__): historic
*32 Secondary DOHU: *Downingia humilis*, RALO : *Ranunculus lobbii*, PODOP: *Pogogyne doug. parv.*, PEGAG: *Perideridia gairdneri g.*, HECO: *Hemizonia congesta*, Q: *Quercus lobata*; (__): hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. CTS: CA tiger salamander, LO: CA linderiella, VPS: v. p. shrimp, FS: freshwater shrimp, R: raptors, W: waterbirds, etc., Ai: sig. aquatic invert.s, Aa: amphibians; (__): potential habitat; < >: sought, not found
*36 Exotics Exotics/pests: C: crayfish, B: bullfrogs, M: mosquito fish, D: dogs/cats; L: *Lippia*, P: *Phalaris*, X: *Xanthium*, G: grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: H: high (land use changes, minor manip.); M medium (some landscape manipulation), L: low, major reconfiguration/grading required; N: none warranted; 0: too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
27E 14	134-022-08 134-022-20		Bates/Stony Point Road W	S	Steve Bates			13, +5	2	Zs	Ru	Rr	CfA, WoA	P	C		P/89, 92, 94	D, P		
27E 15	134-042-11		lands of Kersch	S	Kersch, Kit			7.0	2	Rr, Zs	Ru	Rr, A	WhA, CfA	s, P	C	2	P/93, 94	D, P		
27E 16	35-011-218		Picchi, east end of Broadmoor south	S	Picchi			2.36	2	V	Ru	Rr, V	WhA	P	C	0	P/92	R, P		
27E 17	134-290-05		Hamann	S	Hamann, Lee and Debbie			1.17	2	Rr	Ru	Rr, Af					P/93, 94	D, P		
27E 18			Southwest Santa Rosa Community Park	S	City of Santa Rosa				2	Pr		Rr, Ah	ZaA, CfA	P	C	0	P/92, 93	C		
27E 19	043-152-27 043-152-28 043-152-30		Moorland Park	P	Chador ?			6.94	0	Rr	Ru	Rr	WoA	P	C	0	P/91, 93	D		
27E 20	043-170-18		3323 Moorland Ave., west side, Gardner Homes	P	Gardner Homes/Veale Investments ?			2	1	Rr, V	Ru	Rr	WoA	P	C	0	P/92, 93	D		
27E 21			Orchard Park (3365 Moorland Ave.)	P	Poulsen ?			10 ?	1	Rr, V	Ru	Rr, C/I								
27E 22	043-072-09 043-072-08		Bellevue Elementary School site (2665 South Dutton)	S	Bellevue Union School District			10.6	2	V	Ps	Rr, Af	ZaA	P	C	0	P/92, 93	D		
27E 23	134-042-021		'Wismer' , east side of Stony Pt. Road, opposite Ludwig	S	Wismer			20	2	Rr, Ap	Ru ?	Rr, Ah	WoA, WhA	P	C	0				

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
	a	Zs, h, w, d														
	n	G, M, t,				-	-	-					<LO, CTS>	D	Rr, G,	M
	n														Ru	
						-	-	-					<LO, CTS>			
"V"	A	Pr	1.0 ?												Pr, F	
s, w	A	Rr, d, F	0.29 C	0	20/2	-	-	-			annual grasses and weeds		<LO, CTS>	D	Ru	L/N
s, v, w	a	Rr, Z, M, T, w	0.29 C	2	20/2	-	-	-			Lolium, Mentha, Hord., Rumex, Plagio., Phalaris, Xanthium		<LO, CTS>	D	Ru, T, w	L
	A	Ao, w, h, T, Rr, j													T, h, Rr, j	
s, d	a, g	Rr	0.34	2	0/2	-	-	-			Lolium, Hord. hys., Picris, Geranium, Rumex		<LO, CTS>	D		L/N
	a	Zs, h, f, G, w, i?													Ru, Zs, h, w	

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*3 EO No. Element Occurrence number with CNDDB (# - Species)
*4 Place Name General location name or description
*5 Geog. Sub- **W:** Windsor, **L:** Laguna, **U:** urban Santa Rosa (SR), **S** SW SR, **N:** NW SR, **E:** E SR, **P:** S SR Plain; **R.** rural SR, **C:** Cotati
*6 Owner Owner of site
*7 City Photo Flight line number, SR city air photo (200-scale)
*8 Zoning Zoning/Gen Plan , __/Co = county, __/Ci = city
*9 Site size Approx acreage of site (generally one parcel)
*10 Contig.with Contig. with other significant parcels? **0** = isolated, no other significant sites adjacent; **1:** undeveloped land adj., but no sig. wetlands; **2. 1-3** adj. or < 20 ac sig. adj. land; **3:** 4 or > sig. adj. parcels or >20 ac sig adj. land; **4:** >10 ac sig. adj. **public** land
*11 Current Use A = Agriculture **Aw:** wastewater **Ao:** orchard **Ap** pasture **Ar:** row crops **Av:** vineyard, **Ai:** irrigated, **Af:** hayfield, R = Residential **Rr:** rural **Ru:** urban. V = Vacant P = Public **Pc:** conservation, **Pr:** recreation, park, **Ps** school **Pp:** wastewater pond, **Pi:** wastewater irrigation, **Pu:** public utility C / I: commercial/industrial
*12 Prop. Use Proposed or likely future land use(s), (see # 11)
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*15 Hydrol. Sys. Primary hydrologic system: **S/s:** major / minor surface system, **G/g:** groundwater, **P/p:** perched water table, **F/f:** floodplain
*16 Restr. Layer Restrictive soil layer ? S_: dense surface clay (**Se:** entire profile = clay, **Ss:** compacted surface layer); B_: subsurface layer (**Bc:** clay, **Ba:** cemented alluvium, **Bo:** other),
*17 Watershed **0:** less than 2 ac, **1:** 2-10 ac, **2:** 10-50 ac, **3:** > 50 ac
*18 Years Surv. Investigator / yr: **P:** Patterson, **W:** Waaland, **G:** Guggolz, **H:** Harrison, **O:** Ornduff, **R:** Rubtzoff, **S:** WESCO, **M:** McCarten, **N:** Northern, **Q:** Quibell, **JS:** Jones & Stokes
*19 Level Surv. **C:** casual, fence, airplane; **R:** reconnaissance; **D:** detailed (EIR, etc.); P_: Data proprietary: data given are from: **Pc:** CNPS, NDDB; **Pg:** gen'l knowledge, lit., or unrestricted access; **Pp:** submitted to an agency; **Pn:** NW Annex. EIR; **Ps:** SW Annex. EIR; **Pa:** air photos
*20 Vouchers Voucher? (see # 18) / receptor site: **CAS:** Calif. Acad. Sci.; **JEP:** Jepson; **DAV:** UC Davis; **UC:** UC Berkeley; **JC:** SR JC / year
*21 Photos Reference photos available ? (see # 18 for symbols)
*22 Habitats Habitats: **V/v:** sig./minor vernal pools, **S/s:** swales, **R/r:** riparian, **P/p:** peren. marsh, **M/m_:** meadow (_w: wet, _d: dry), **C/c:** creek, **D/d:** ditch / flood channel, **A/a:** farmed wetlands, **F/f:** floodplain, **W/w:** other wetlands, **N/n:** man-made pond, **U_:** other significant upland habitats (**Ug:** native grassland, **Uw:** wildflowers, **Uo:** oak woodland, **Us:** oak savanna). **(__):** historic; "__" = man-made habitat
*23 Natural. **N:** natural topog., ± unaltered (**n:** with minor alterations); **A:** hist. sig. altered (**a:** sig. altered, but stabile); **X:** completely graded/converted
*24 Influences Major influences: **F/f:** major/minor fill, **G/g:** major/minor grading, **Z_:** grazed (_c: cattle, _s: sheep, _h: horses), **Y/y:** livestock yard, **D/d:** disked, **O/o:** mowed, **C/c:** cultiv., **I/i:** irrig., **J/j:** junk, **H/h:** hydrol. altered, **M/m:** manure, **E/e:** exotics, **W:** weeds, **T/t:** thatch, **V/v:** vehicles, **R/r:** residential use, **S:** wastewater; **(__):** hist.
*25 Acres Wet Est. wetland acreage (**C**): confirmed by Corps of Eng.
*26 Wet./Up. Ratio of wet. to upland: **0** = trace wet. or less than 5 % of site, **1** = 5-10 % wet., **2** = 10-20 %, **3** = 20-50%, **4** = > 50 %
*27 Wet. Break. % aquatic/no. of features: **1:** solitary, **2:** 2-5, **3:** 6-15, **4:** >15
*28 LABU *Lasthenia burkei*: **E:** extant, **X:** extirp., **H:** hist./abund. class. '0': none, **0:** <10 plants, **1:** 10-100, **2:** 100-500, **3:** 500-1000, **4:** 1000-5000, **5:** 5000-10,000, **6:** 10,000-100,000, **7:** > 100,000 / year
*29 LIVI *Limnanthes vinculans*; (see # 28 for codes)
*30 BLBA *Blennosperma bakeri*; (see # 28 for codes)
*31 Other Pri. Other sensitive spp: **NAPL:** *Navarretia pleiantha*, **NABA:** *N. bakeri*, **ALAES:** *Alopecurus aequalis sonomensis*, **TRAM:** *Trifolium amoenum*, **PLHO:** *Pleuropogon hooverianus*, **CAAL:** *Carex albida* ; **(__):** historic
*32 Secondary **DOHU:** *Downingia humilis*, **RALO** : *Ranunculus lobbii*, **PODOP:** *Pogogyne doug. parv.*, **PEGAG:** *Perideridia gairdneri g.*, **HECO:** *Hemizonia congesta*, **Q:** *Quercus lobata*; **(__):** hist.
*33 Dom. pl. Brief listing of dominant plants
*34 Spp. List Plant species list available? (see # 18)/year
*35 Sens. Wild. **CTS:** CA tiger salamander, **LO:** CA linderiella, **VPS:** v. p. shrimp, **FS:** freshwater shrimp, **R:** raptors, **W:** waterbirds, etc., **Ai:** sig. aquatic invert.s, **Aa:** amphibians; **(__):** potential habitat; **< >:** sought, not found
*36 Exotics Exotics/pests: **C:** crayfish, **B:** bullfrogs, **M:** mosquito fish, **D:** dogs/cats; **L:** *Lippia*, **P:** *Phalaris*, **X:** *Xanthium*, **G:** grasses
*37 Threats Perceived threats (see codes for # 11 and 24)
*38 Rest. Pot. Pot. for restor.: **H:** high (land use changes, minor manip.); **M:** medium (some landscape manipulation); **L:** low, major reconfiguration/grading required; **N:** none warranted; **0:** too altered, no real potential

SITE LOCATION AND IDENTIFICATION								PHYSICAL ENVIRONMENT									OTHER SITE INFO.			
Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
* 1	* 2	* 3	* 4	* 5	* 6	* 7	* 8	* 9	* 10	* 11	* 12	* 13	* 14	* 15	* 16	* 17	* 18	* 19	* 20	* 21
27E 24			west side of South Dutton, south of Bellevue	S	?					V		Rr, C/I		s, P	C	0	P/90	D		
27E 25	043-071-22 043-071-23 043-071-07		'Tuxhorn east' east of South Dutton, south of Bellevue	S	Gould and McGill			12.05		V, Af	Ru?	Ru, Rr								
27E 26			Colgan Creek north, south of Bellevue, east of S Dutton	S	Peletz ?			19.53	2	Af	Ru	Rr, Ru					P/92, 93	D		
27E 27			'Matterei Ranch?' west of Petaluma Hill Road	E	Martin, Ken ?				1	A	Ru?	Rr, Ap, Ru	CeA, WoA			2	P/91 ?	D		
27E 28	134-022-07		'Martin' site between Broadmoor North and 'Bates'	S	Martin, Ken			7.41	2	V		Rr, Ap	CfA, WoA	s, P	C	1	P/89, 92-94	D		
27E 29	134-225-14		Primrose Ave.	P	Smith, Loretta			2.02		Rr							G/93			
32B 01	062-240-33	15-LIVI 2-ALAES	Gundelfinger; Llano Rd. at Laguna, 0.5 mile N of Hwy 116	L	Gundelfinger		A1 - B5 - F2	4.60 57.74	3	Rr, Ap		Rr, A	WoA, CtC, CtD	S, s, P, F, N		2	R/66, 73; H/78; G/79; W/88; P/92	R, D	R/CAS	
32B 02			'City mitigation site' Laguna at Llano (Stony Pt. Rd. mitigation site)	L	City of Santa Rosa				2	V	Pc	Rr, Pu		P, F			P/92, 93	D		
33A 01	045-033-44		200 Scenic	P	Haroutunian				2	Ap	Pc	A	CeA	s		1	W/92, 93	D		
33A 02			'Howery'; Scenic, between RR and freeway	P	Williamson ? / Howery ?				0	V	Pc	Rr								

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
s, v, Us	n	(Z), h?	0.3	0	20/2	-	-	-		RALO	Pleuro., Lilaea, Plagio. Down. con., Mentha, Lolium, Hord.				Ru, C/I	M
	a	(C), (Z), T, G														
w	A	Ah, G, C	0.3 ?			-	-	-								L
s, a, d	a	C, D, t, (Z)				-	-	-			annual grasses				Ru	L - M ?
s, v, d	a, d	Z, h				-	-	-		RALO	Rumex, PLagio., Lolium, Hord., Juncus, Pleuro.				Ru/Rr?, h, w, t	M
s, v?, Ug							E/4/93				Pleuro., Down. Lasth. glab.					
s, v, R, r, M, C, Sp, p	N	Zc	2+	2	30/2	-	E/5/79 E/?/88 E/6/92	-	ALAES - historic	RALO	annual grassland, oaks			C, M, D	Rr, Zc, Ap	H/N
s, D, f, r	a	D, t, g, f, H				-	-	-			Pleuro. cal., Hord., Mentha		<LO, CTS>	D, C, M		H
S, s, v, V	n	Z, g?, w, t, (Ao?)		3	50/2	-	E/?/93	E/6/93 E/6/94?						D	w, t	H
s	A	F !!!														

*1 Map Code — Co photo # + sequential # (contin from Waaland, '89)
*2 A.P. No.s — Sonoma County Assessor's Parcel number(s)
*3 EO No. — Element Occurrence number with CNDDB (# - Species)
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*5 Geog. Sub- — **W**: Windsor, **L**: Laguna, **U**: urban Santa Rosa (SR), **S** SW SR, **N**: NW SR, **E**: E SR, **P**: S SR Plain; **R**: rural SR, **C**: Cotati
*6 Owner — Owner of site
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*11 Current Use — A = Agriculture **Aw**: wastewater **Ao**: orchard **Ap**: pasture **Ar**: row crops **Av**: vineyard, **Ai**: irrigated, **Af**: hayfield, R = Residential **Rr**: rural **Ru**: urban. V = Vacant P = Public **Pc**: conservation, **Pr**: recreation, park, **Ps**: school **Pp**: wastewater pond, **Pi**: wastewater irrigation, **Pu**: public utilityC / I: commercial/industrial
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Map Code No.	Sonoma County A.P. No.s	NDDB EO No.	Place Name	Geog. Sub-region	Owner	City Air Photo No.	Zoning - Gen'l Plan	Site Size (ac)	Contig. w/ Other Sig. Parcels?	Current Land Use	Proposed Land Use	Adjacent Land Uses	Soils	Hydrol. System	'Hardpan'	Water-shed	Years Surveyed	Level of Survey	Voucher ?	Photos ?
*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*11	*12	*13	*14	*15	*16	*17	*18	*19	*20	*21
33A 03			'Church' site	P	?? (being purchased by SCAPOSD ?)					V	Pc ?	A, V, Rr								
33A 04	046-011-11		Pimental - parcel 11, west side of Stony Point Road, north of Laguna	L	Pimentel					Af	(spoils)	Ap, I								
33A 05	046-011-12 046-011-14 046-011-17		Pimental - parcel 12, west side of Stony Point Road, south of Laguna	L	Pimentel					V	Pu (spoils)	Ac	fill							
33A 06	046-021-20		Pimental - parcel 20 east side of Stony Point Road, west edge of Hinebaugh Creek	L	Pimentel					Ar/Ai	(spoils)	Ai, Rr, C/I								
33A 07	046-032-12 046-032-18 046-032-19 046-032-23 046-032-26		Poncia Dairy	L	Poncia				3	Zc, Ai, Af		A	HaB	s, P	C	2	P/93	D		
33A 08	numerous partial parcels along right of way		Stony Point Road realignment - Gossage Creek alternative area	L	misc.				2	Ap, V		A	HaB	s, P	C	0	P/91-93	D		
33A 09	200 + partial parcels in right of way		Stony Point Road widening ROW	L, R	misc.					Rr							P/89, 91-93; S/90?	D		
33A 10	46-021-20	20-BLBA	E side Stony Point Road, N of Laguna	P	Pimentel					Ac		Af, Ap								
33A 11	46-111-08 46-111-09		Helman Lane	C	Transonoma ?					Rr, Ap	Ru ?	Rr, A	HaB, CeA	s, P, f	C		P/91	D, P		
33A 12	144-050-02 144-050-03 46-286-03 46-286-07		Bennett Properties - Cotati	C	Bennett Properties - Cotati			30.33	1	V	C/I	Rr, C/I	HaB	s, P	C	2	H/89, G/8-?; P/90; M/991-94	R, D		

B I O T I C

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	B
*22	*23	*24	*25	*26	*27	*28	*29	*
	A	(Z), I, D, T, w, H				-	-	-
	a	I, T, G, w, h				-	-	-
	A	I, C, D, G, H, T				-	-	-
s, v, d, r	a	Zc, I, Pi, M, T, W, h, g				-	-	-
s, v, r	n	Z, m, T				-	-	-
s, v, C, c, Us, R, r	n					-	-	se 1 O
	n	Zc, w, t, h						E/ 1 E/ E/
s, v	a	Rr, (Z), h, D, g, f, w, t				-	-	-
S, s, v, V	n, A	(Z), F, w, T, D, g, H, E	2.5 C	1 (2)	50/2	-	0/88-91 E/1/92 E/1/93	-

B I O T I C E N V I R O N M E N T

Habitats Present	Natural-ness	Major Influences	Acres Wet	Wet./Up Ratio	Wetland Breakdown	LABU	LIVI	BLBA	Other Primary Plants	Secondary Sensitive Plants	Dominant Plants	Spp. List Avail.?	Sensitive Wildlife	Exotics/ Pests	Threats	Restoration Potential
*22	*23	*24	*25	*26	*27	*28	*29	*30	*31	*32	*33	*34	*35	*36	*37	*38
	A	(Z), I, D, T, w, H				-	-	-							Ai	
	a	I, T, G, w, h				-	-	-							I, C, Z (Pi?)	
	A	I, C, D, G, H, T				-	-	-								
s, v, d, r	a	Zc, I, Pi, M, T, W, h, g				-	-	-			annual grasses			D		M
s, v, r	n	Z, m, T				-	-	-					<LO, CTS>	D	Rr, A, Z	L/N
s, v, C, c, Us, R, r	n					-	-	see 33A 10		RALO, Q.			<LO, CTS>	D, C, M	Rr, Ru, A	N
	n	Zc, w, t, h						E/1/87 E/__/8? E/__/_?		PODOP					Z, I?	
s, v	a	Rr, (Z), h, D, g, f, w, t				-	-	-						D	Ru, Z, t	M
S, s, v, V	n, A	(Z), F, w, T, D, g, H, E	2.5 C	1 (2)	50/2	-	0/88-91 E/1/92 E/1/93	-		RALO	Pleuro. cal., Hord. hys., Lolium, Rumex, Down. con., Lasth. glab., Mentha, Callit.	H, P, HLA	0	D	C/I, Rr, T, H	

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33A 13	046-021-14		Poncia north; east side Stony Pt. Road, north of Laguna, south of Wilfred	P	Poncia			34.17	1	Af		Af, Ap		P			P/87	D		

B I O T I C E N V I R O N M E N T

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a	A	C, D, g				-	-	E/1/87	-		Pleuro. cal. !!!			C	Af, Ai?	M

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