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*

Prepared for:

Ann Howald
California Department of Fish and Game
P.O. Box 47, Yountville, CA 94599
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Prepared by:

Charles A. Patterson
Plant Ecologist
1806 Ivanhoe Ave., Lafayette, CA 94549

In collaboration with:
Betty Guggolz and **Marco Waaland**

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SEASONAL WETLAND BASELINE STUDY REPORT FOR THE SANTA ROSA PLAIN

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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.

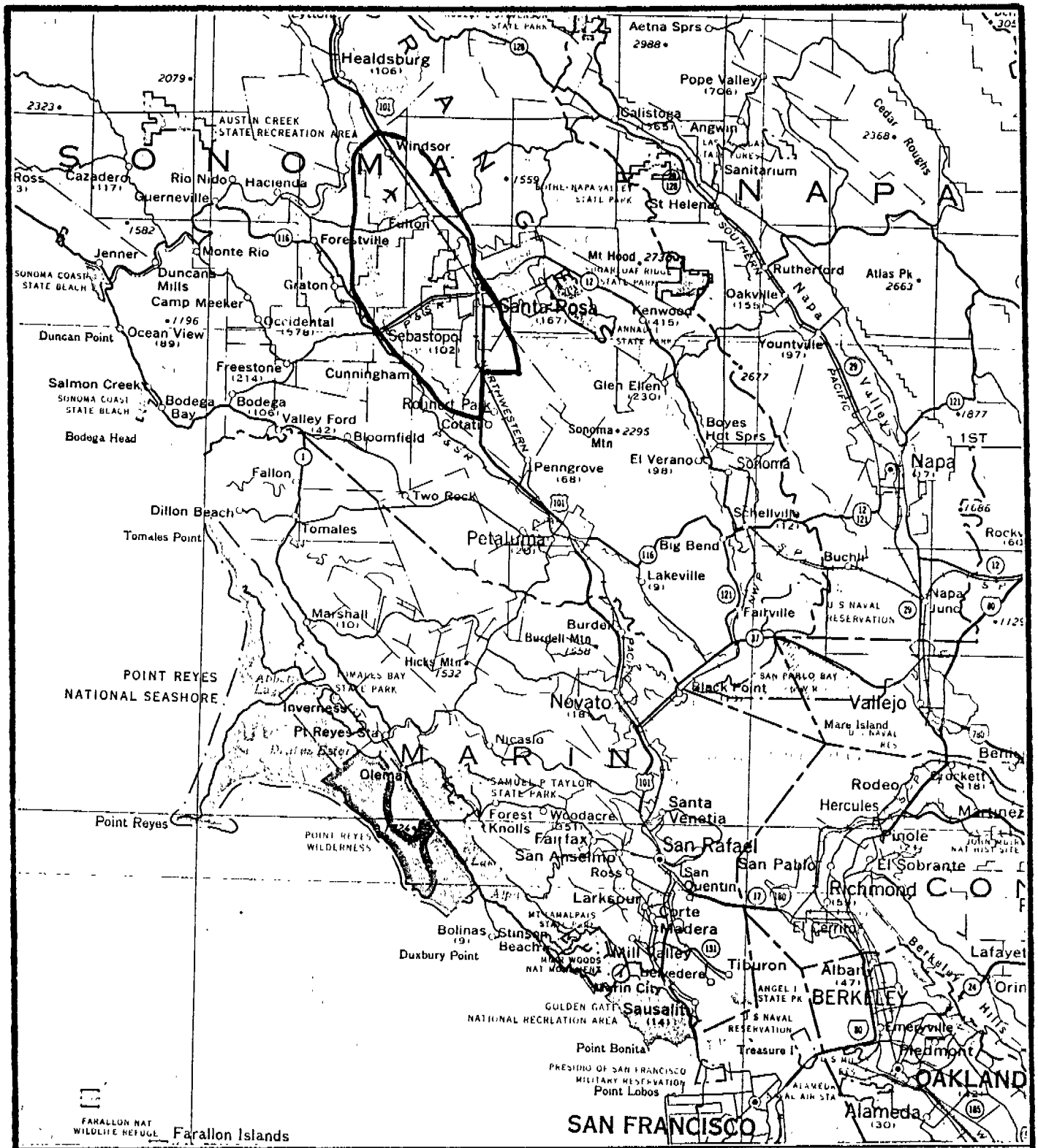

FIGURE 1
Study Area Regional Location

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.

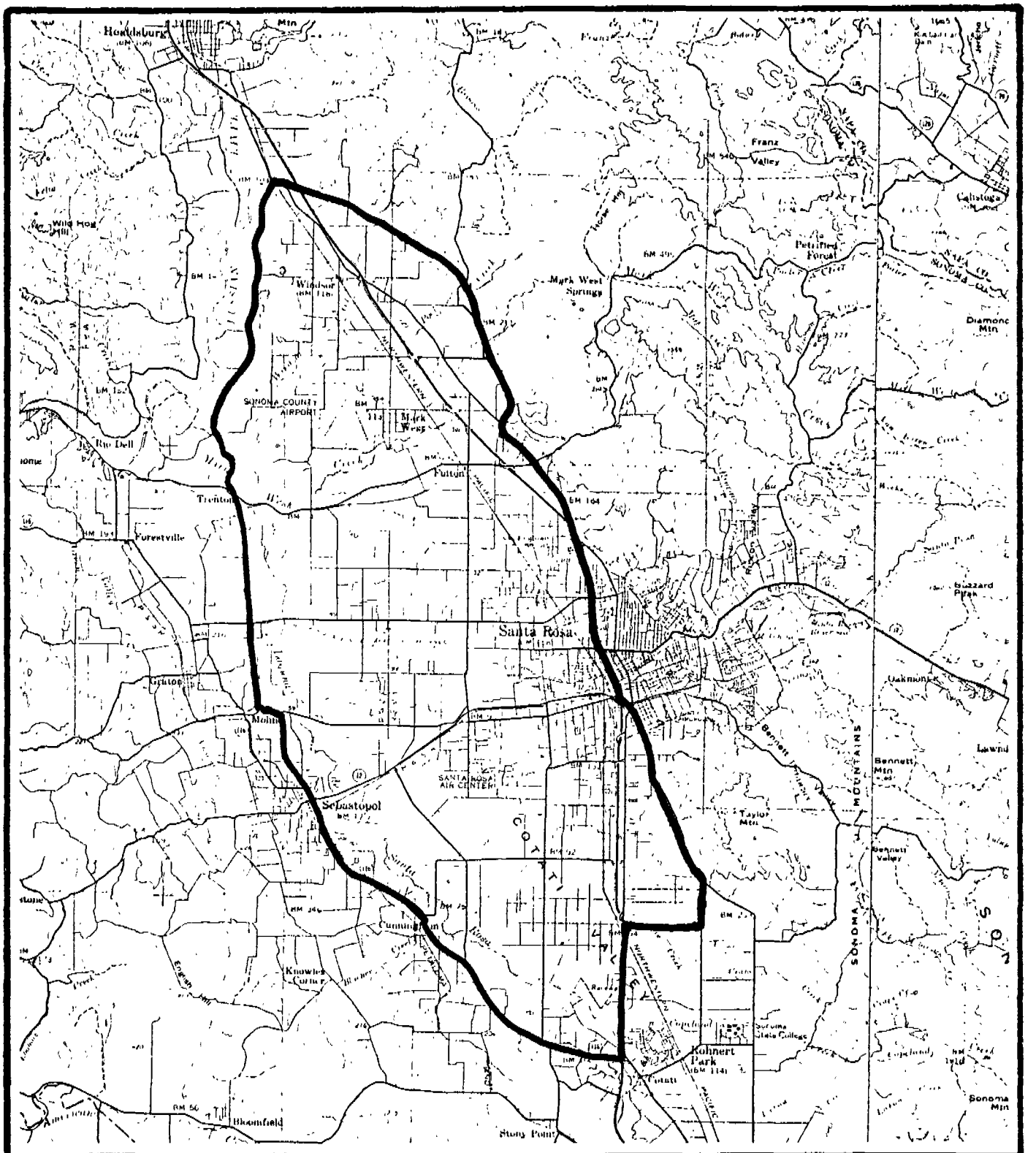

FIGURE 2
Study Area Setting

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

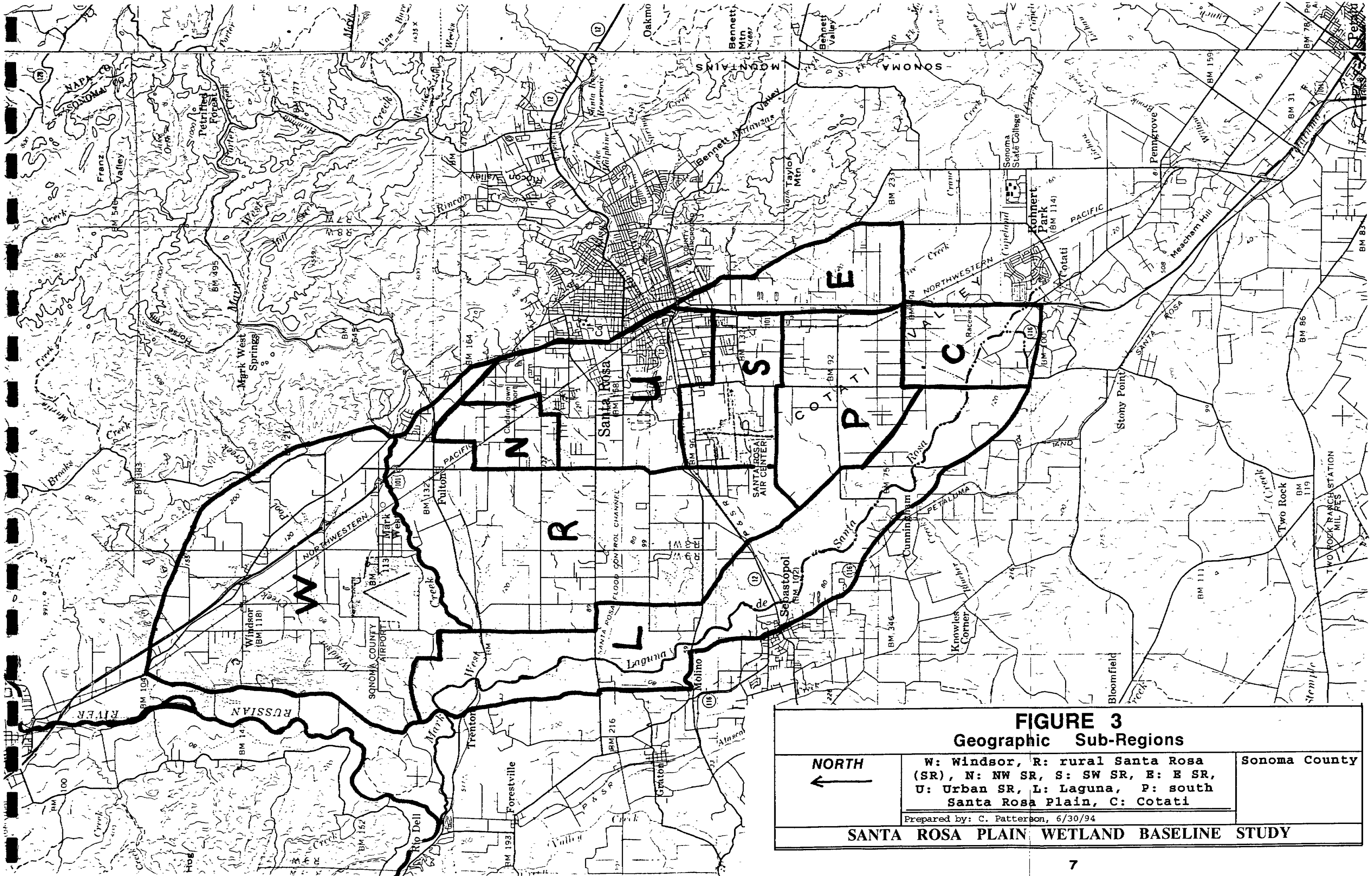

FIGURE 3
Geographic Sub-Regions

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

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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.